# Table of Contents

Schedule of Events ..................................................................................................... 3

Keynote Biography ..................................................................................................... 4

Featured Research Biographies ................................................................................ 5

Oral Presentations ...................................................................................................... 7

Poster Session I ........................................................................................................ 13

Poster Session II ....................................................................................................... 41

Acknowledgements ................................................................................................... 71
DOM Research Day 2021 Schedule of Events

8:00 – 8:15 am: Welcome David Stephens MD, Chair, Department of Medicine

8:15 – 9:15 am: Concurrent Oral Session I

Group A
Featured Research I
8:15 am: Adam Gracz, PhD, Assistant Professor, Division of Digestive Diseases
“Dissecting cellular and genetic heterogeneity in GI tissues”

Oral Presentations I
8:30 am: Arun Balasubramanian (Digestive Diseases)
“SARS-CoV-2 induces enteric neuronal production of Vasoactive Intestinal Peptide as a potential mechanism of COVID-19-associated diarrhea”
8:45 am: Juline Deppen (Cardiology)
“Alginate-encapsulated mesenchymal stromal cells improve hind limb ischemia in swine”
9:00 am: Kosuke Kato (Pulmonary)
“Endothelial Nox4 mediates age-dependent severity and impaired resolution of acute lung injury”

Group B
Featured Research II
8:15 am: Sara Auld, MD, MSc, Assistant Professor, Division of Pulmonary
“Covid-19: A journey across the spectrum of translational research”

Oral Presentations II
8:30 am: Ankita Agarwal (Pulmonary)
“SWEAT ICU – a Study of Workload and the Association of outcomes in the ICU”
8:45 am: Tracey Henry (General Medicine)
“Making an impact with E.M.P.A.C.T.: A new pilot mentoring program for URiM learners”
9:00 am: Maxwell Su (Infectious Diseases)
“SARS-CoV-2 variant analysis by real-time RT-PCR, Asunción, Paraguay”

9:15 – 10:15 am: Poster Session I

Group I: Quality improvement - Healthcare practice
Group II: Quality improvement - Predictors of clinical outcomes
Group III: Health disparities, health equity, & vulnerable populations
Group IV: Case reports - Unusual management or complications
Group V: Covid-19 treatment & clinical outcomes
Group VI: Molecular basis of disease
Group VII: Oxidative stress & inflammation
Group VIII: Inflammation & immunity

10:15 – 10:30 am: Break

10:30 – 11:30 am: Concurrent Oral Session II

Group C
Featured Research III
10:30 am: Srilatha Edupuganti, MD, Professor, Division of Infectious Diseases
“Why don’t we have a vaccine for HIV?”

Oral Presentations III
10:45 am: Joel Eggert (Rheumatology)
“Strong basal TCR signaling mitigates the responsiveness of naive CD8+ T cells”
11:00 am: Onyinya Iheaku (Hospital Medicine)
“COVID-19 vaccine hesitancy among metro Atlanta healthcare workers”
11:15 am: Ambreen Merchant (Digestive Diseases)
“Necrotizing pancreatitis mortality and healthcare burden in the United States: A nationwide analysis”

Group D
Featured Research IV
10:30 am: Jessica Alvarez, PhD, RD, Associate Professor, Division of Endocrinology
“Nutritional metabolomics to identify novel pathways linked to body composition”

Oral Presentations IV
10:45 am: Sarah Hernandez (Infectious Diseases)
“Simple, economical RNA extraction packets for low resource communities”
11:00 am: Amany Gerges (Endocrinology)
11:15 am: Matthew Ryan Smith (Pulmonary)
“Novel approaches to assess metabolic dysregulation in pulmonary hypertension”

11:30 am – 12:30 pm: Poster Session II

Group IX: Covid-19 epidemiology & immunity
Group X: Quality improvement - Disease prevention
Group XI: Case reports - Difficult diagnoses
Group XII: Management of acute & chronic diseases
Group XIII: Molecular profiles in lab & clinic
Group XIV: Pathophysiology of acute & chronic diseases
Group XV: Pathogenesis, diagnosis, and treatment of infection & chronic diseases
Group XVI: Novel methods in diagnostics, treatment, & management

12:30 – 1:00 pm: Lunch

1:00 – 2:00 pm: Keynote Presentation Kathleen Cooney, MD, Chair, Department of Medicine, Duke University, “Understanding inherited forms of prostate cancer: from familial risk to metastatic prostate cancer”

2:00 – 2:30 pm: Featured Research V Peter Wilson, MD, Professor, Division of Cardiology “Big data and cardiovascular risk”

2:30 – 3:00 pm: Research Accomplishments and Awards David Stephens, MD, Chair, Department of Medicine
Keynote Speaker

1:00 pm

Kathleen Cooney, MD, MACP “Understanding inherited forms of prostate cancer: from familial risk to metastatic prostate cancer”

Dr. Cooney is the George Barth Geller Distinguished Professor of Medicine and Chair of the Department of Medicine, Duke University School of Medicine, in Durham, North Carolina.

Dr. Cooney was recruited to Duke University in 2018 to become the tenth chair of the Department of Medicine. This department is the largest in the School of Medicine and is highly ranked in all missions. New initiatives under Dr. Cooney’s leadership include completion of strategic planning to guide the research and clinical missions, recruitment of a number of new leaders, and strong commitment to addressing diversity, equity and inclusion.

Dr. Cooney is a medical oncologist focused on caring for men with prostate cancer and internationally known for investigations examining the genetic epidemiology of prostate cancer. She discovered a recurrent mutation in the \textit{HOXB13} gene that increases the chances of being diagnosed with prostate cancer. Her current research focuses on identifying germline mutations associated with lethal and aggressive prostate cancer as well as prostate cancer in African American men.

Dr. Cooney received her MD from the University of Pennsylvania Perelman School of Medicine in Philadelphia and completed her training in Internal Medicine and Hematology/Oncology at the University of Michigan. She previously served as chair of Internal Medicine at the University of Utah; before that, she served for nearly 10 years as the division chief of Hematology/Oncology and deputy director of the Comprehensive Cancer Center at the University of Michigan.
Featured Research Speakers

8:15 a.m. – Group A: Featured Research I
Adam Gracz, PhD, Assistant Professor, Division of Digestive Diseases
“Dissecting cellular and genetic heterogeneity in GI tissues”

Dr. Adam Gracz completed his pre- and postdoctoral training in intestinal stem cell biology at UNC Chapel Hill and joined the Division of Digestive Diseases in August 2020. His lab investigates how transcriptional and chromatin regulation contribute to cell fate decisions in the intestine and intrahepatic bile ducts during homeostasis and regeneration.

8:15 a.m. – Group B: Featured Research II
Sara Auld, MD, MS, Assistant Professor, Division of Pulmonary
“COVID-19: A journey across the spectrum of translational research”

Dr. Sara Auld is an assistant professor of medicine in the Division of Pulmonary, Allergy, Critical Care and Sleep Medicine. After receiving a bachelor’s degree in history from Stanford University, Dr. Auld attended Columbia University College of Physicians and Surgeons and completed her residency at Massachusetts General Hospital. Before coming to Emory in 2013, she worked at the Centers for Disease Control & Prevention as an Epidemic Intelligence Service Officer in the International TB Branch of the Division of TB Elimination. Dr. Auld’s research is focused on the clinical epidemiology and transmission of TB and drug-resistant TB, as well as TB and HIV coinfection. She is also interested in the host immune response to TB infection, including the pulmonary alveolar macrophage response to TB and mechanisms by which HIV infection may impair that response.

10:30 a.m. – Group C: Featured Research III
Srilatha Edupuganti, MD, Professor, Division of Infectious Diseases “Why don’t we have a vaccine for HIV?”

Dr. Srilatha Edupuganti is a professor in the Division of Infectious Diseases with expertise in vaccinology and immunology. She has expertise in phase 1, 2, and 3 clinical trials testing novel vaccines and novel vaccine delivery systems, with a specific interest in HIV vaccine development. She serves as a site principal investigator, co-chair and chair of multiple investigational vaccines, monoclonal antibodies and other biomedical prevention modalities for Infectious Diseases. She is the Hope Clinic Clinical Research Site Leader for the Emory Clinical Trials Unit and the Clinical Core Leader for Cooperative Centers for Human Immunology at the Emory Vaccine Center. She also aims to inspire the next generation of vaccinologists by mentoring junior-level faculty, infectious disease fellows and public health students.

10:30 a.m. – Group D: Featured Research IV
Jessica Alvarez, PhD, RD, Associate Professor, Division of Endocrinology
“Nutritional metabolomics to identify novel pathways linked to body composition”

Dr. Jessica Alvarez is an Associate Professor of Medicine in the Division of Endocrinology, Metabolism, and Lipids. Her NIH and Foundation-funded research focuses on the role of nutrition and body composition on metabolism in healthy and clinical populations such as people living with cystic fibrosis. She serves as Director for the Georgia CTSA Certificate Program in Translational Research and Associate Director within the Georgia Cystic Fibrosis Research Core Center. In addition to service on the DOM Faculty Development Committee, Dr. Alvarez is also an active faculty member within DOM Diversity Equity and Inclusion Council and the Emory Nutrition and Health Sciences PhD program.
2:00 p.m. – Featured Research V

Peter Wilson, MD, Professor, Division of Cardiology
“Big data and cardiovascular risk”

Dr. Peter Wilson is Professor of Medicine in the Division of Cardiology, Professor of Public Health (Global Health, Epidemiology) in the Rollins School of Public Health, and Director of Epidemiology and Genomic Medicine at the Atlanta VA Medical Center. He graduated with a B.S. from Yale University in 1970 and received his medical degree from the University of Texas Medical School at San Antonio in 1974. His postgraduate medical training took place at Duke University and he worked for the National Heart, Lung, and Blood Institute from 1978-1999. Prior to coming to Emory in 2006 he was Professor of Medicine at the Boston University School of Medicine (1999-2003) and at the Medical University of South Carolina (2003-2006). He is board certified in internal medicine and endocrinology. Dr. Wilson is an author or coauthor of more than 650 scientific articles and four books.
Oral Presentations

8:15 – 9:15 am
Concurrent Oral Session I

Group A

8:30 am
#12 – SARS-CoV-2 induces enteric neuronal production of Vasoactive Intestinal Peptide as a potential mechanism of COVID-19-associated diarrhea

Background: Diarrhea is present in up to 36.6% of patients with COVID-19. The mechanism of SARS-CoV-2-induced diarrhea remains unclear. We hypothesized that enterocyte-enteric neuron interactions were important in SARS-CoV-2-induced diarrhea. SARS-CoV-2 induces endoplasmic reticulum (ER) stress in enterocytes causing the release of Damage Associated Molecular Patterns (DAMPs). The DAMPs then stimulate the release of enteric neurotransmitters that disrupt gut electrolyte homeostasis. Methods: Primary mouse enteric neurons (EN) were exposed to conditioned medium from ACE2-expressing Caco-2 colonic epithelial cells infected with SARS-CoV-2 or treated with tunicamycin (ER stress inducer). Vasoactive intestinal peptides (VIP) expression and secretion by EN was assessed by RT-PCR and ELISA, respectively. Membrane expression of NHE3 was determined by surface biotinylation. Results: SARS-CoV-2 infection led to increased expression of phospho-PERK and Xbp1s in Caco-2 cells. Infected cells secreted DAMP proteins, including HSP70 and calreticulin, into the culture media as revealed by proteomic and Western analyses. The expression of VIP mRNA in EN was up-regulated after treatment with conditioned medium of SARS-CoV-2-infected Caco-2 cells. CD91, a receptor for HSP70 and calreticulin, into the culture media as revealed by proteomic and Western analyses. The expression of VIP mRNA in EN was up-regulated after treatment with conditioned medium of SARS-CoV-2-infected Caco-2 cells. CD91, a receptor for HSP70 and calreticulin, is abundantly expressed in cultured mouse and human EN. Tunicamycin, an inducer of ER stress, also induced the release of HSP70 and calreticulin, mimicking SARS-CoV-2 infection. Co-treatment of Caco-2 with tunicamycin (apical) and VIP (basolateral) induced synergistic decrease in membrane expression of Na+/H+ exchanger (NHE3), an important transporter that mediates intestinal Na+/fluid absorption. Conclusions: Our findings demonstrate that SARS-CoV-2 enterocyte infection leads to ER stress and the release of DAMPS that up-regulate the expression and release of VIP by EN. VIP in turn inhibits fluid absorption through downregulation of brush-border membrane expression of NHE3 in enterocytes. These data highlight epithelial-neuronal crosstalk in COVID-19 related diarrhea.

8:45 am
#29 – Alginate-encapsulated mesenchymal stromal cells improve hind limb ischemia in swine
Juline Deppen, Ginn SC, Kim NH, Wang L, Levit RD

Alginate-encapsulated mesenchymal stromal cells (eMSCs) promote revascularization in murine hind limb ischemia (HLI), but large animal efficacy assessment better facilitates bench-to-bedside success in peripheral artery disease (PAD) patients. We hypothesize that eMSCs will improve ischemia in our model of sustained swine HLI. One external and both internal iliac arteries were ligated, and empty capsules (ECs) or autologous eMSCs were injected into ischemic semimembranosus muscles after 2 weeks (N=4/group). Terminal procedures were performed 4 weeks post-capsule delivery. Recovered ECs and eMSCs remained fully intact with the latter containing live MSCs with no histological evidence of cellular escape nor increased fibrosis vs. ECs. eMSC animals did not exhibit depressed ischemic limb ankle-brachial indices 4 weeks post-administration vs. pre-ligation (0.65±0.12 vs. 0.88±0.21, p>0.05) that were present in the EC group (0.69±0.17 vs. 1.02±0.19, p<0.01). eMSCs trended to improve collateral vessel formation near ligation sites via contrast angiography. Hyperemic muscle perfusion was significantly increased by eMSCs in the distal posterior compartment (ischemic/non ischemic ratio 1.07±0.19 vs. 0.41±0.16 for ECs, p<0.05) with trending improvements in the hamstring (0.86±0.22 vs. 0.59±0.10 for ECs, p=0.06). eMSCs improved ischemia-induced distal posterior muscle atrophy (2.79±0.12 vs. 1.90±0.62 g/kg body weight for ECs, p<0.05). Limb dysfunction (ischemic/non-ischemic limb force-time impulses via walkway gait analysis) normalized to pre-ligation 3 weeks post-delivery of eMSCs (0.63±0.35 vs. 1.02±0.19, p>0.05) but not ECs (0.42±0.33 vs. 1.04±0.15, p<0.01). eMSCs are well-tolerated and improve blood flow and limb function in PAD on a human scale in this novel porcine HLI model.
9:00 am
#79 – Endothelial Nox4 mediates age-dependent severity and impaired resolution of acute lung injury
Kosuke Kato, Hecker L

Rationale: The mortality rate for acute respiratory distress syndrome (ARDS) remains unacceptably high (35-40%), and there is no adequate therapy. Although aging is a risk factor for ARDS, the mechanisms that account for age-associated predisposition remain largely unknown. The pathological features of ARDS, endothelial barrier dysfunction, are strongly associated with oxidative stress. We previously demonstrated that Nox4-dependent reactive oxygen species (ROS) plays a critical role in mediating endothelial cell (EC) barrier responses during acute lung injury (ALI). In the current study, we evaluated the role of Nox4 in the pathogenesis of ALI in the context of aging.

Methods: Young (2 month) and aged (18 month) WT and endothelial targeted Nox4 knockout (Nox4-eKO) mice were subjected to ALI. ROS levels and severity of ALI were evaluated. To evaluate the role of senescence in EC permeability, we employed a previously developed in vitro cellular model of replicative senescence. Results: In response to ALI, aged mice exhibit persistently elevated Nox4 and heightened ROS levels resulting in failure to resolve the injury. Control ECs exhibit a rapid and transient induction of Nox4, whereas senescent ECs exhibit persistently elevated Nox4 leading to impaired barrier function. Senescent ECs exhibit deficient ubiquitination of Nox4, via aberrant upregulation of the deubiquitinating enzyme UCHL1, which contributes to sustained Nox4 expression. Aged Nox4-eKO mice exhibited striking protection following insult vs. modest protection in young.

Conclusions: Our data suggest that specifically targeting mechanisms that become defective in aging (e.g., persistently elevated endothelial Nox4) will provide the most significant therapeutic benefit and may be the key to improving outcomes for elderly ARDS patients.

8:30 am
#2 – SWEAT ICU – a Study of Workload and the Association of outcomes in the ICU

Introduction: We investigated if clinician workload is independently associated with burnout in ICU physicians and hypothesized an increase in burnout syndrome (BOS) in those with ≥14 patients. Methods: A cross-sectional study in 14 sites from August 2020 to July 2021 assessing the association of ICU workload (pt:MD ratio) with clinician burnout. A key secondary outcome was 28-day patient mortality. Burnout syndrome (BOS) was measured by the Well-Being Index (WBI)(scores -2 to 9, ≥4 = BOS).Clinician and patient characteristics were compared using Chi-square test (or Fisher’s exact test) for proportions and Wilcoxon Rank Sum test for medians. A logistic regression model calculated odds ratios (OR) and 95% confidence intervals (CI). Workload was modeled as a dichotomous variable (high ≥ 14 patients, low < 14 patients). Results: 107 physicians were enrolled with median pt:MD ratio of 12 (IQR 10-14) and median WBI score of 2 (IQR 1-4). Baseline characteristics were similar between physicians with high workload (n=37) or low workload (n=70). 1043 patients were included. BOS prevalence was 24% for physicians with high workload, and 29% with low workload (overall prevalence 27%). Preliminary analysis showed no difference in BOS in those with high versus low workload, (unadjusted OR 0.85, 95% CI 0.63-1.15). Conclusion: In our cohort, there was no relationship between workload and burnout.

Factors other than workload may play important roles as drivers of burnout. Intro: We investigated if clinician workload is independently associated with burnout in ICU physicians and hypothesized an increase in burnout syndrome (BOS) in those with ≥14 patients. Methods: A cross-sectional study in 14 sites from August 2020 to July 2021 assessing
the association of ICU workload (pt:MD ratio) with clinician burnout. A key secondary outcome was 28-day patient mortality. Burnout syndrome (BOS) was measured by the Well-Being Index (WBI) (scores -2 to 9, ≥4 = BOS). Clinician and patient characteristics were compared using Chi-square test (or Fisher’s exact test) for proportions and Wilcoxon Rank Sum test for medians. A logistic regression model calculated odds ratios (OR) and 95% confidence intervals (CI). Workload was modeled as a dichotomous variable (high ≥ 14 patients, low < 14 patients). Results: 107 physicians were enrolled with median pt:MD ratio of 12 (IQR 10-14) and median WBI score of 2 (IQR 1-4). Baseline characteristics were similar between physicians with high workload (n=37) or low workload (n=70). 1043 patients were included. BOS prevalence was 24% for physicians with high workload, and 29% with low workload (overall prevalence 27%). Preliminary analysis showed no difference in BOS in those with high versus low workload, (unadjusted OR 0.80, 95% CI 0.32–2.00). When workload was treated as a linear variable, there was no difference between groups (p= 0.82). At day 28, 52% of patients were discharged, 20% still hospitalized, and 28% had died. There was no difference in patient outcomes between high versus low workload groups (28-day odds of death, unadjusted OR 0.85, 95% CI 0.63-1.15). Conclusion: In our cohort, there was no relationship between workload and burnout. Factors other than workload may play important roles as drivers of burnout.

8:45 am
Tracey Henry, Adeagbo S, Rodriguez J, Hood Y

Background: The purpose of the EMPACT (Engage, Mentor, Prepare, Advocate for, Cultivate, and Teach) is to provide students who self-identify as an underrepresented in medicine (URiM) and/or those who may come from disadvantaged backgrounds, with experiences that foster timely and successful matriculation through medical school in a supportive and inclusive learning environment. Methods: The EMPACT Pilot Program was conducted 2019-2020 academic year. A total of 19 EMPACT mentorship groups were created consisting of two resident/fellow/faculty mentors and three-four medical students for a total of 68 medical students and 38 mentors. The mentoring groups met separately an average of 3 times during the program. Additionally, four workshops were held: Microaggressions and Bystander, Wellness during COVID-19, Overcoming the Imposter Phenomenon and a CV building. Outcomes: When comparing before and after the EMPACT program, there was a statistically (P<.05) significant increase for mentees feeling ready to handle clinical rotations 28% to 65%, sense of community 79% to 94% and there was a significant decrease in feeling the need to have an advocate 85% to 47%. The majority of students were satisfied or very satisfied with the EMPACT educational experience (79%) and the program overall (85%). 94% students would recommend the EMPACT program to other students. 93% of mentors would recommend the EMPACT program to other mentors. Conclusions: Overall a successful program. We met our program goals to foster a sense of community, strengthen social support with structured mentoring relationships for URiM students and fostered personal and professional growth.

9:00 am
**#127 – SARS-CoV-2 variant analysis by real-time RT-PCR, Asunción, Paraguay**
Maxwell Su, Nguyen P-V, Martinez M, Rojas A, Waggoner JJ

Background. Detection and surveillance of SARS-CoV-2 variants by whole-genome sequencing is not feasible in Paraguay, where access to sequencing technology is limited. We evaluated the performance of a laboratory-developed rRT-PCR (rRT-PCR) to sensitively detect mutations associated with variants of concern in Asunción without the need for sequencing. Methods. 201 acute-phase nasopharyngeal samples from SARS-CoV-2-positive individuals were tested with two rRT-PCRs: 1) N2RP assay to confirm SARS-CoV-2 RNA detection (CDC N2 target), and 2) the Spike SNP assay, which utilizes a single primer set and tiled probes to detect mutations in the receptor binding domain of spike. The Spike SNP assay was modified for the current study to detect mutations associated with the following variants: alpha (501Y), beta/gamma (K417 variant/484K/501Y), delta (452R/478K), and lambda (452Q/490S). Results. All 201 samples were positive for SARS-CoV-2 in the N2RP assay (mean CT, 20.80; SD 5.57); 198/201 (98.5%) tested positive in the Spike SNP assay. 104/198 samples (52.5%) showed results corresponding to the gamma variant (484K, 501Y, and absence of K417); 23 samples (11.6%) were consistent with the P.2 variant (484K, K417). One alpha variant (B.1.1.7) was confirmed (501Y; K417), seven samples (3.5%) tested positive for 452R without 478K, and one sample was positive
for 490S. Results were confirmed by Sanger sequencing in 181/181 samples (100%) with high-quality amplicon sequences. Conclusion. Our analysis provides the first systematic evaluation of SARS-CoV-2 variant distribution in Paraguay. The Spike SNP assay may allow other areas that lack widespread sequencing infrastructure to monitor the emergence of significant spike mutations and improve capacity for SARS-CoV-2 variant detection.

**10:30 – 11:30 am**
**Concurrent Oral Session II**

**Group C**

10:45 am
**#34 – Strong basal TCR signaling mitigates the responsiveness of naïve CD8+ T cells**
*Joel Eggert, Zinzow-Kramer WM, Au-Yeung BB*

**BACKGROUND AND AIMS:** T cells are a powerful component of the immune response that, on the one hand, can protect the host from invading pathogens, but on the other hand, T cells can cause self-damage when regulation fails. There are many autoimmune diseases where T cells are sufficient or necessary for inducing a detrimental immune response toward the host. Hence, the activation of T cells has to be a strictly controlled process where only foreign cognate antigen stimulation of the T cell receptor (TCR) generates a robust response. However, naïve T cells constantly interact with self-peptides via their TCR as they scan antigen-presenting cells for their cognate antigen. While persistent antigen stimulation is associated with reduced T cell function and can impair the T cell response against chronic infections or cancer, it remains incompletely understood how chronic basal TCR signaling from self-peptides affects the responsiveness of naïve T cells. This study aimed to examine how basal TCR signaling strength affects naïve CD8+ T cells.

**METHODS:** We investigated the heterogeneity and functional implications of basal TCR signal strength in naïve CD8+ T cells by utilizing a fluorescent reporter mouse (Nur77-GFP) reflective of TCR signaling.

**RESULTS:** We found that strong basal TCR signaling was associated with diminished cytokine secretion and proliferation during the early phase of an immune response. This result indicates that naïve CD8+ T cells that experience strong basal TCR signaling likely become de-sensitized to subsequent stimulation.

**CONCLUSION:** We propose that this de-sensitization of naïve T cells may allow the immune system to limit the autoreactive potential of the most self-reactive naïve CD8+ T cells to prevent autoimmunity.

11:00 am
**#72 – COVID-19 vaccine hesitancy among metro Atlanta healthcare workers**
*Onyinye Ihelu, Kulshreshtha A, Hanna J, Bonds Johnson K, Farrque M, Shin SR, Carroll K, Franks NM, Wiley Z, the CROSS Collaborative, Kandiah S*

**Background:** COVID-19 vaccinations are critical in fighting the COVID-19 pandemic and have been available to healthcare workers (HCW) in Georgia since December 2020. Vaccine hesitancy is a barrier to effective immunization programs and HCW play a crucial role in fostering vaccine acceptance and limiting community spread. We sought to understand vaccine hesitancy among HCW at metro Atlanta healthcare systems.

**Methods:** HCW at Emory, Grady, Kaiser Permanente, and Morehouse were surveyed from May-June 2021 using Qualtrics. We defined “vaccine hesitant” as those who indicated they had not received a COVID-19 vaccine or planned to get it later. Results: Of the 5,329 complete responses, 551 (10%) of the HCW were vaccine hesitant. 43% of the vaccine hesitant respondents identified as Black and 40% identified as White. HCW aged 18-35 years old were more vaccine hesitant (34.5%), held a Bachelor’s degree (37%) and were predominantly nurses (30%). 16% identified as working in the Emergency Department, and 14% in the Intensive Care Unit. Among those who were vaccine hesitant, 95% did not think that vaccines should be required of HCW. Fear of side effects ranked as the top reason for not getting the vaccine (48%). Conclusions: Vaccine hesitancy is prevalent among HCW in metro Atlanta and targeted interventions are urgently needed to reduce vaccine hesitancy.

11:15 am
**#92 – Necrotizing pancreatitis mortality and healthcare burden in the United States: A nationwide analysis**
*Ambreen Merchant, Emad Q*

**Background and aims:** Acute pancreatitis (AP) can lead to pancreatic necrosis and infection, and treatment can be challenging. We aimed to identify the prevalence of necrosis in AP, and its effect on important hospital outcomes. Method: Adult hospitalizations for AP in the 2016-2017 National Inpatient Sample were divided into 3 groups: (1) AP without necrosis, (2) AP with non-infected necrosis, and (3) AP with infected necrosis. Multivariable
models were used to compare hospital outcomes between groups. Results: We identified 179,776 hospitalizations with AP (175,620 in group 1; 3036 in group 2, and 1120 in group 3). Mean age was 53.5 years, 52% were females, and overall hospital mortality was 2%. There was higher mortality in non-infected necrosis (4.8%; OR= 2.5; 95% CI: 2.0-3.0) and infected necrosis (7.8%; OR= 3.1; 95% CI: 2.4-3.9) compared to those without necrosis (1.9%). Mean length of stay and cost of care were higher in infected necrosis (19.3 d; $58,373) and non-infected necrosis (10.5 d; $28,306) compared to those without necrosis (5.3 d; $13,030). Conclusion: Necrotizing pancreatitis is independently associated with increased mortality, length of stay, and cost of care. Infected necrosis further increases mortality. This highlights the importance of optimizing management of AP to prevent the development of necrosis.

Group D

10:45 am

#61 – Simple, economical RNA extraction packets for low resource communities
Sarah Hernández, Myers DR, Waggoner JJ

Background. Molecular diagnostics provide accurate RNA virus detection but require costly RNA extraction protocols for optimal performance. The objective of this study was to develop an economical, rapid, and safe RNA extraction protocol for low resource settings. Methods. Initial design was based on the filtration isolation of nucleic acids (FINA) originally developed for HIV DNA isolation (Figure 1). Each step in the extraction process was evaluated to identify 1) a safe and effective lysis buffer, 2) optimal RNA-membrane binding, and 3) elution. All packets were evaluated with replicate extractions of contrived serum sample containing dengue virus and testing by rRT-PCR. Following optimization, RNA extraction from clinical samples was compared to a commercial technique. Results: Two commercial silica membranes demonstrated concentration-dependent binding of DENV RNA from 108 to 100 copies/µL, which was significantly increased in an acidic arginine solution. A non-toxic lysis buffer was developed containing sucrose, KCl, proteinase K and carrier RNA. The optimized protocol involved no instrumentation and included the following steps: 1) sample (25µL) incubation in lysis buffer, 2) addition of amino acid buffer and ethanol, 3) liquid transfer to packet, 4) one wash, and 5) membrane transfer to tris-EDTA (pH 8.0) for rRT-PCR. Extraction packets were ∼10-fold less analytically sensitive than an automated, commercial extraction protocol at a cost of 7.5 cents/sample. Conclusion. Economical RNA extraction packets provide efficient and reproducible viral RNA extraction. This technique relies on simple and stable reagents while eliminating the need for instrumentation. Such packets may provide a reliable alternative for low resource settings and during reagent shortages.

11:00 am


Amany Gerges, Moazzami B, Galindo R, Ali M, Funni SH, Dodge AB, Kurani SS, Shah ND, Umpierrez GE, McCoy RG

Objective: We characterized annual trends of severe hypoglycemic and hyperglycemic crises (diabetic ketoacidosis/hyperglycemic hyperosmolar state) in patients with diabetes and end-stage kidney disease (DM/ESKD). Design: Nationwide, retrospective study of adults (≥18 years) with DM/ESKD, from the United States Renal Data System registry, 2013 to 2017. Primary outcome was annual rates of emergency department visits or hospitalizations for hypoglycemic and hyperglycemic crises, reported as number of events/1000 person-years. Adjusted event rates and risk factors were adjusted for patient age, sex, race/ethnicity, dialysis modality, comorbidities, treatment regimen and U.S. region. Results: Among 521,789 adults with DM/ESKD (median age 65 years [IQR 57-73], 56.1% male, and 46% White), overall adjusted rates of hypoglycemic and hyperglycemic crises were 53.64 and 18.24 per 1000 person-years, respectively. For both crises, the risks were highest among younger patients (≥75 vs 18-44 years: IRR 0.35 [95% CI 0.33-0.37] and 0.03 [0.02-0.03], women (IRR 1.09 [1.06-1.12] and 1.44 [1.35-1.54]), and with smoking (IRR 1.36 [1.28-1.43] and 1.71 [1.53-1.91]), substance abuse (IRR 1.27 [1.15-1.42] and 1.53 [1.23-1.9]), retinopathy (IRR 1.10 [1.06-1.15] and 1.36 [1.26-1.47]), and insulin therapy (vs. no therapy; IRR 0.60 [0.59-0.63] and 0.44 [0.39-0.48]), for hypoglycemia and hyperglycemia, respectively, all p<0.01. For hypoglycemia, specifically, additional risk was conferred by Black race (IRR 1.11 [1.08-1.15]) and amputation history (IRR 1.20 [1.13-1.27]). Conclusions: In this nationwide study of patients with DM/ESKD, hypoglycemic crises were three-fold more common than hyperglycemic crises, greatly exceeding national reports in non-dialysis
patients with chronic kidney disease. Young, Black, and female patients were disproportionately affected.

11:15 am

125 – Novel approaches to assess metabolic dysregulation in pulmonary hypertension
Matthew Ryan Smith, Trammell AW, Murphy TC, Ma J, Ly V, Sutliff R, Go YM, Jones DP, Hart CM

Background: Pulmonary hypertension (PH) is characterized by advanced remodeling of the pulmonary vasculature leading to right-heart failure. PH due to hypoxia and lung disease (Group 3) is incurable and associated with significant morbidity and mortality. Therapies for Group 3 PH are ineffective due to their inability to reverse underlying metabolic derangements that cause pulmonary vascular cell proliferation and remodeling. An additional limitation is the inability to study metabolism in relevant tissues from living PH patients. However, our previous studies have found that platelets, which are partially generated within the lung environment, may address this limitation. We hypothesize that platelets act as a biosensor that recapitulates mitochondrial dysfunction in PH.

Methods: Platelets and serum were isolated from subjects with Group 3 PH or controls for mitochondrial profiling using the extracellular flux analyzer and high-resolution metabolomics. Results were confirmed in the Sugen-hypoxia model of PH in rats. Platelets, and pulmonary artery smooth muscle cells (PASMC) were isolated for mitochondrial profiling. Results: Metabolic profiles from Group 3 PH subjects revealed changes to fatty and amino acid which directly impact mitochondrial metabolism, and also correlated with decreased mitochondrial bioenergetics. Additionally, bioinformatics analysis revealed changes to fatty and amino acid pathways which linked to one or more of the mitochondrial parameters. Rats with experimental PH and RV hypertrophy also showed decreased mitochondrial respiration in both isolated platelets and PASMCs.

Conclusions: These preliminary results provide compelling data in the utilization of platelets as a suitable model to study PH-related mitochondrial dysregulation.
Poster Presentations

9:15 – 10:15 am Session I
(listed by order of presentations within groups)

Group I: Quality improvement - Healthcare practice

9:15 – 9:21 am
#80 – Risk factors for SARS-CoV-2 seropositivity among nursing home staff
Amin AB, Joseph Kellogg, Adams C, Dube WC, Collins MH, Lopman BA, Johnson TM, Weitz J, Fridkin SK

Background/Aims: SARS-CoV-19 transmission within skilled nursing facilities (SNF) can be explosive. We aimed to estimate infection rates and quantify risks for SARS-CoV-2 infection among SNF staff. Methods: We performed survey and seroprevalence assessments in fall and early spring of the pandemic at 14 SNFs in Georgia. We assessed SARS-CoV-2 serostatus evaluating both reactivity to spike protein alone (vaccine induced response) or in combination with nucleocapsid protein (infection induced response). We estimated risk for infection accounting for demographics, job role, community case rate, SNF resident infection rate. Results: 772 staff participated at baseline timepoint (starting in October 2020) and 807 at second timepoint (starting in February 2021); 372 (49%) participated in both (median of 4.1 months between timepoints). Certified nursing assistants and nurses were three times more likely to be seropositive than other staff at baseline (adjusted OR: 3.43 and 3.15, respectively; 95% CI: 1.74-6.76 and 1.61-6.14, respectively) even after adjusting for COVID-19 rates in the staff’s community (zip code) or the specific SNF. Among 372 eligible for seroconversion analysis, 59 (16%) were persistently seronegative, 147 (39%) had only presence of vaccine induced antibody, and 73 (20%) had evidence of SARS-CoV-19 infection between time points. Predictors of infection induced seroconversion included Black race (OR 2.49, 95% CI 1.31-5.1) but not job category. Conclusions: The findings that type of job, a proxy for occupational exposure, was predictive of infection in the spring but not in the fall suggests that later in the pandemic occupational exposure was a less of a driver of staff infections, while others (related to Black race) persist.

9:21 – 9:27 am
#85 – A comparison of patient satisfaction in outpatient telemedicine vs in-person clinic visits
Julianne Kubes, Kulshreshtha A, Franks N, Wiley Z

Background: Patient satisfaction surveys are a common tool used to improve the quality of care in healthcare organizations. In response to the COVID-19 pandemic, Emory Healthcare adopted telemedicine in April 2020 for outpatient clinic visits. Our goal is to determine if patient satisfaction differs between outpatient telemedicine vs in-person clinic visits. Methods: Press Ganey patient satisfaction surveys were administered to all outpatients who completed a telemedicine or in-person clinic visit at Emory Healthcare between May 2020 and May 2021. The questions in the survey included ‘likelihood of recommending care providers’, ‘overall likelihood of recommending service’, and ‘if staff worked together to care for the patients’. Patients reported their visit experience by rating on a five-point Likert scale, and a positive rating was indicated if the patient responded either “Good” or “Very Good” to the question. Chi-square tests were used to analyze differences between telemedicine and in-person clinic visits. Results: A total of 190,911 surveys were completed; 65,108 (34.1%) from telemedicine and 125,803 (65.9%) from in-person clinic visits. Patients who had telemedicine visits rated the likelihood of recommending care practitioners slightly lower than in-person visits (96.4% vs. 96.5%; p-value=0.22). Patients who had telemedicine visits rated the likelihood of staff working together significantly lower than in-person patients (95.6% vs. 97.1%; p-value<0.01). Telemedicine patients rated the overall likelihood of recommending the service significantly lower than in-person patients (96.2% vs. 96.7%; p-value<0.01). Conclusion: Our study demonstrates that patient satisfaction rates are in general lower in telemedicine visits compared to in-person outpatient clinic visits.

9:27 – 9:33 am
#95 – An intervention to improve shift change handoffs
Amy Miller, Kapuria M, Hanna J, Hemrajani R, Obisesan A

Aim Statement: To improve patient care communication between Emory at Grady hospitalists by implementing standardized handoffs in EPIC EMR. Background: National guidelines
recommend that hospitals implement a standardized approach to handoffs, but our hospital medicine group had none. At baseline, providers were encouraged to handoff information about acutely ill patients or "to do" items at shift change, without a consistent formalized process. Baseline data showed 32% were very/somewhat satisfied with shift handoff practice, 45% satisfied, 23% somewhat/very dissatisfied. For shift start, 28% were very satisfied/somewhat satisfied, 36% satisfied, 37% somewhat/very dissatisfied. For shift end, 27% were very/somewhat satisfied, 45% satisfied, 28% somewhat/very dissatisfied.

Methods: We reformatted the EPIC written tool to align with iPass and trained providers. We assessed opinions using surveys and informal interviews and acknowledged high compliance during staff meetings. Results: Over 8 months, handoff compliance was 40%, 57%, 43%, 65%, 45%, 37.5%, 35%, 42%. Post-intervention results showed 41% were very/somewhat satisfied with shift handoff practice, 38% satisfied, 21% somewhat/very dissatisfied. For shift start, 34% were very/somewhat satisfied, 63% satisfied, 4% somewhat/very dissatisfied. For shift end, 46% were very/somewhat satisfied, 46% satisfied, 8% somewhat/very dissatisfied. Conclusions: Compliance with handoffs remained at ~40%, except 57% in December 2020, following a site meeting reminder in November, and 65% when EPIC was reformatted to include the mandatory iPass tool in February 2021. Barriers to uptake include time spent and redundancy. An established culture of handoffs and cross-cover through note review may have limited uptake. This intervention increased our group’s awareness of handoffs. We continue to evaluate and address barriers to uptake.

9:39 – 9:45 am

#135 – Improving continuity of care in a gastroenterology fellowship clinic

Background: Continuity of care is the backbone of a successful patient-physician relationship. Continuity reduces mortality, improves satisfaction, and encourages disclosure, leading to personalized care. Our project aims to analyze continuity barriers and improve follow-up rates. Methods: Our fellows’ clinic is part of an academic safety-net hospital. Pre-intervention data collection took place Oct-Dec 2020. We used a root cause analysis to identify barriers to continuity. We implemented a PDSA cycle which involved fellow education and messaging a scheduler following visits Feb-Mar 2021. For our second cycle, we input follow up time on the EMR and patient instructions to involve patients in the responsibility to schedule follow up. Outcome measures were continuity and follow up rates. Results: Of 298 visits in the pre-intervention period, 64 patients were previously seen with a 21% continuity rate. During intervention, with 94/230 patients were seen by the same provider, with a 41% continuity rate. This is a statistically significant increase in continuity (Chi square p=.00001). Pre-intervention, 159/320 (50%) patients needing follow up had follow up scheduled. During our first test of change, 74/112 patients
eligible for follow up (66%) were made a follow up, 
Chi square p=.05. For our second test of change, 
44/82 patients eligible to make follow up (54%) did 
so, which was increased from baseline. We also 
analyzed factors including no-show rates, fellow 
year, and reasons for visit. Conclusion: By 
educating fellows, staff, and patients to be 
proactive about ensuring follow up and creating 
system changes to scheduling, we increased 
continuity of care by 20% and follow up scheduling 
by 16%. Similar systems can be implemented in 
other clinics to ensure optimal care.

9:45 – 9:51 am  
#141 – Evaluation of clinicians’ knowledge and 
use of minimum inhibitory concentration  
Lucy Witt, Spicer JO, Burd E, Kraft C, Ahmed B

Background: Minimum Inhibitory Concentration (MIC) refers to the minimum antibiotic concentration that visibly inhibits growth of bacteria and is a ubiquitous method of antimicrobial susceptibility testing (AST). Despite its reproducibility MIC can vary depending on clinical situation and microbiological techniques. Whether MIC should be regularly reported to clinicians along with interpretations remains debatable. Methods: We created an online survey, distributed via email, to assess providers’ knowledge of MIC and use in clinical cases. Survey respondents were provided a set of clinical vignettes to elucidate real-world responses to MIC data. The first vignette included a clinical case without MIC data. Respondents were asked to select the most appropriate antibiotic to prescribe. They were then given a comparable case including MIC data and interpretation. Respondents were again asked to select the most appropriate antibiotic to prescribe. Following these vignettes respondents were asked a series of multiple-choice questions regarding MIC. Survey data was analyzed using descriptive statistics. Results: Of the 230 survey respondents, 47% identified as attending physicians, 23% as residents and 13% as advanced practice providers. Seventy-six percent correctly defined MIC and 57% wanted MIC data routinely available to them. When provided comparable clinical vignettes, 44% of clinicians changed their antibiotic selection when provided with MIC data. Of those who changed their answer, 51% cited the MIC as the reason for change. A majority of respondents (85%) who changed antibiotic chose a new antibiotic with a lower MIC. Conclusion: Our survey found that a majority of clinicians could define MIC and wanted MIC data. A large number of respondents changed their antibiotic choice in clinically comparable cases when given MIC data and most cited lower MIC as the reason for change. These findings indicate that clinicians may inappropriately use MIC data and suggests that MICs should not be routinely released with AST results.

9:57 – 10:03 am  
#46 – Crooke cell adenomas in patients with 
Cushing’s disease: A tertiary care center experience  
Erica Giraldi, Neill SG, Mendoza PR, Oyesiku NM, Ioachimescu AG

Introduction: Crooke cell adenomas (CCA) were identified as a clinically aggressive pituitary adenoma subtype by the WHO in 2017. Two surgical series published before the updated WHO classification reported a prevalence of CCA among Cushing’s disease (CD) of 6.8% and 4.9% respectively. Data regarding prevalence and clinical course is sparse. Methods: Retrospective review, 59 consecutive CD cases operated between Oct 2017-Nov 2020, with CCA diagnosis confirmed by two neuropathologists. We evaluated their clinical, biochemical and radiological presentation, as well as postoperative outcomes. Results: In our case series, prevalence of CCA among operated CD patients was 8.5% (5/59). Our patients, 4 women and 1 man, mean age 46±11 years, presented with hypercortisolism (3/5), vision loss (1/5) and incidentally (1/5). All patients had elevated ACTH (151±53 pg/ml) and urinary free cortisol levels (830±796.5 µg/day). Radiologically, 3 tumors were macroadenomas of which 2 with cavernous sinus invasion. The ki67 proliferation index and mitoses were not increased. All 5 patients achieved biochemical remission at 3 months postoperatively. One patient underwent fractionated radiation for a residual tumor in context of a giant pituitary adenoma preoperatively. Length of follow-up ranged from 5.2-39.0 months. Discussion/Conclusion: We report a higher CCA prevalence among functioning ACTH-adenomas than previously published, probably due to the implementation of 2017 WHO classification in clinical practice. All patients had high ACTH levels and majority had macroadenomas, which is not usually the case for CD. Postoperative biochemical and radiological outcomes were excellent, but longer follow-up is needed to determine tumor behavior.
10:03 – 10:09 am
#19 – Impact of COVID-19 mitigation measures on PrEP care at a safety net health system in Atlanta

Background: The Grady Health System pre-exposure prophylaxis (PrEP) program modified its care practices to accommodate COVID-19 mitigation measures. Changes included: 100% telemedicine visits, medication mail delivery, and flexible timing of quarterly laboratory testing. This study aimed to evaluate patients’ acceptability of these modifications and to assess their impact on PrEP care. Methods: This was a cross-sectional study in a convenience sample of PrEP patients, ages 18 and older, at an urban clinic in Atlanta. Participants completed a survey which assessed the mitigation measures’ impact on PrEP care, follow up visits, medication access, completion of laboratory testing, as well as telemedicine acceptability. Data were examined using median and interquartile ranges, and proportions. Results: Of 145 patients contacted, 61 completed the survey (median age 33 years, 72% Black, 75% cisgender men). Most didn’t report interruptions in their PrEP care (72%) or follow up visits (74%). Most found it easy to access medications (82%). Interruptions in completing quarterly labs were more frequently reported, as only 62% found this to be easy. Overall, 89% reported using telemedicine; telephone call was the most used method (78%). Telemedicine users’ ratings for quality, usability, and satisfaction of telemedicine was high (median score: 6/7) and nearly all users (97%) reported no concerns about its continued use for PrEP care. Conclusions: PrEP care at an urban clinic was well-maintained despite COVID-19 mitigation measures. Telemedicine was acceptable and usable. Future research on widescale implementation of telemedicine for PrEP care is needed.

Group II: Quality improvement - Predictors of clinical outcomes
9:15 – 9:21 am
#130 – Assessing COVID-19 vaccine uptake among people living with HIV in the Atlanta VA healthcare system
Melissa Taylor, DeSilva KE, Epstein LH, Moanna A

Background: The Atlanta VA Infectious Diseases Clinic (IDC) implemented measures to promote and improve COVID-19 vaccination rate in people living with HIV (PWH). Our goal was to determine the impact of these efforts on COVID-19 vaccination rates and compare with other populations. Methods: Beginning in March 2021, the Atlanta VA IDC implemented targeted outreach strategies to educate PWH regarding COVID-19 vaccinations including emails, phone calls, and informational appointments. We assessed vaccination rates among PWH who had at least one clinical encounter in the IDC from December 15th, 2020 through August 5th, 2021. We stratified vaccination status by age and HIV viral load and compared PWH vaccination rates with all patients at the Atlanta VA healthcare system and the population of Georgia. Results: As of August 5, 2021, the overall rate of full vaccination was among 1248 PWH was 69%. In comparison, the vaccination rate of all patients at the Atlanta VA (50%) and the population of Georgia (39%) was lower. PWH with a HIV viral load of <200 had a higher vaccination rate compared to PWH with a higher viral load (77% vs. 66% respectively). In each age cohort, the PWH vaccination rate was higher compared to the state of Georgia; the greatest difference was observed among 45-64-year-olds (26%). Conclusions: PWH at IDC had higher rates of COVID-19 vaccination compared to all patients at the Atlanta VA and the population of Georgia. This is likely due to proactive patient outreach, education and follow up.

9:21 – 9:27 am
#54 – A quality improvement project to improve lab safety monitoring in IBD patients on Immunomodulators using the Veterans Affairs IBD dashboard and a multidisciplinary team
Amneet Hans, Farino V, Nwafor B, Jacob L, Prasad M

Background/Aims: Patient’s with IBD who are on immunomodulators require routine labs to monitor for toxicities such as leukopenia and elevated liver chemistry tests. For patients on chronic therapy, CBC with differential and CMP should be monitored
Abstract

every 3 months. Of the 71 patients on immunomodulators for IBD at the Atlanta VA, 39.2% were up to date on labs on January 5, 2021. For patients who were overdue for labs, there was no process in place to identify these patients, ensure labs orders were up to date, or call patients with reminders. Methods/Results: To track lab safety monitoring, we utilized the IBD dashboard to identify all IBD patients on immunomodulators. We identified those who did not have labs within a 3-month period. We tracked the percentage of patients up to date on their labs and tracked this number on a weekly basis for three months. In Figure 1a, we identify some of the missed opportunities for lab safety monitoring. The process map in Figure 1b demonstrates how we implemented this project. Each week, the GI PharmD identified patients who were overdue on labs and notified the IBD nurse manager. The IBD nurse manager called patients with a reminder to complete labs and determined the reason for missed labs. If the patient did labs, they were renewed by the MD or PharmD as appropriate and if labs weren’t done, the PharmD alerted the IBD nurse manager to reach out to the patient again. Lab adherence rates increased from 39.2% to 81.7% at the Atlanta VA. Conclusion: We implemented a sustainable, multidisciplinary team involving the GI physician, GI PharmD and IBD nurse manager to monitor lab adherence in IBD patients on immunomodulators, increasing the lab adherence from 39.2% to 81.7% and improving the culture of safety at the Atlanta VA.

9:27 – 9:33 am

#87 – Qualitative evaluation informs understanding of motor cognition and therapies in older adults with mild cognitive impairment

David Lazris, Perkins M, Bay A, Hackney M

Background: 10% to 20% of Americans aged 65 and older have mild cognitive impairment (MCI) with 10% progressing to Alzheimer’s Disease (AD) each year. Underserved groups, including African Americans (AAs), are among the most vulnerable to MCI and AD. Although evidence continues to amass about the benefits of exercise and movement for AD still understudied in AD.

Objectives: Understanding the attitudes and beliefs about motor-cognitive integration of predominantly Black women community members with self-reported memory problems will allow improved recruitment and refinement of multimodal interventions designed to improve motor-cognitive and cognitive function. Methods: We conducted focus groups with older adults who reported subjective memory complaints (n=15; Black: n= 12, White: n= 3, mean age 71.7+ 5.8). Results: Findings from thematic analysis showed most participants knew of benefits of exercise. However, most participants reported not getting adequate exercise due to factors such as pain, increased responsibilities, and fears of injury. Despite barriers, participants expressed enthusiasm for multimodal interventions designed to target body and brain health and provided several suggestions to improve or enhance the proposed interventions. Conclusion: Results provide useful insights regarding improving participation among historically under-represented groups in clinical movement-based research. Participant’s discussion focused primarily on the way motor-cognitive integration prevents falls, maintains memory, and provides a social benefit. The reported perceived benefits and limitations of exercise, as this population understands it, can help researchers and physicians better engage the community for lifestyle changes that will support greater motor-cognitive health.

9:33 – 9:39 am

#126 – Bridging the gap to optimal dosing for guideline-directed medical therapy for patients with heart failure and reduced ejection fraction

Nathan Steele - Azobou Tonleu F, Campbell M, Miller S, Arrington R, Chen Z, Fatade Y, Ogunniyi M

Introduction: The key to improving heart failure (HF) outcomes and its ultimate impact on reducing health care costs include the initiation, optimization, and maintenance of guideline-directed medical therapy (GDMT) in patients with Heart Failure and Reduced Ejection Fraction (HFrEF). The ACC/AHA/HFSA guidelines recommend maximum tolerated doses for these patients unless contraindicated. Despite widespread knowledge, there is underutilization of GDMT at recommended target doses in eligible patients. Hypothesis: Majority of eligible patients (>50%) in our safety-net HF Clinic are on optimal doses of GDMT. Methods: We conducted a retrospective analysis of GDMT use in patients who were diagnosed with HFrEF between January 1 to March 31, 2019 and completed at least two HF clinic visits in 2019. The primary outcomes were percent of patients on optimal doses of: (1) beta blockers, (2) renin-angiotensin-aldosterone (RAAS) inhibitors, and (3) mineralocorticoid antagonists (MRAs). Optimal dose was defined >/= 50% of target dose or maximum tolerated dose. Results: Our cohort of 227 patients was predominantly male (70%),
African American (94%) with mean age of 59 +/- 11 years. Most patients were on beta blockers (96%) and RAAS inhibitors (88%). Only 11% were on Angiotensin Receptor/Nephrilysin Inhibitors (ARNI), and 30% on MRAs. Only 52%, 43%, and 20% of patients were prescribed target doses of beta blockers, ACEI/ARBs, and MRAs respectively.

Conclusion: GDMT dosing in our safety-net HF Clinic was suboptimal. Based on these findings, we are implementing a quality-improvement process to facilitate early initiation and up-titration of GDMT with the overall goal of reducing the morbidity/mortality in our patient population.

9:45 – 9:51 am
#16 – Understanding and improving shared decision-making for patients considering primary prevention ICD implantation: A key informant study
Rao BR, Merchant F, Christine Bethencourt, Abernathy E, Howard D, Matlock D, Dickert NW

Background and Aims: Implantable cardioverter defibrillators (ICDs) are a guideline recommended treatment for the prevention of sudden cardiac death in certain patients with heart failure. To ensure decisions about implantation of primary prevention ICDs are patient-centered, the Centers for Medicare and Medicaid Services (CMS) now requires a shared decision-making (SDM) interaction prior to ICD implantation. This requirement focuses on the use of a patient decision aid (DA). However, the role of the DA in patients’ decisions is unclear, and there is limited data on how the SDM process can be improved.

Methods: We conducted a qualitative key informant study nested in a prior survey study comparing the impact of the SDM mandate. Through a purposive sampling strategy ensuring thematic saturation of analytically interesting domains, 20 participants were interviewed about their experiences making an ICD decision. All interviews were audio recorded, transcribed verbatim, and qualitatively analyzed using MAXQDA. Results: Most participants’ decision about ICD implantation occurred over multiple visits and was discussed with multiple doctors. However, the DA was exclusively used during electrophysiology visits, by which point many patients already had substantive discussions about the ICD. When asked how the SDM process can be improved, patients identified both informational and experiential needs.

Conclusion: The CMS SDM requirement for ICD implantation focuses on the use of a DA, but this study reveals some of the complexities of the decision and important areas where the DA requirement may or may not align. Improving the DA can help address patients’ informational needs; however, understanding how SDM can support patients’ experiential needs greater attention.

9:51 – 9:57 am
#41 – An intervention to improve COVID-19 vaccination rates among inpatients at a Veterans Affairs hospital
Ayako Wendy Fujita, Goolsby, TA, Powell KM, Cartwright EJ

Background: Hospitalizations are an opportunity to increase vaccine uptake and hospital-based strategies have been effective at increasing influenza and pneumococcal vaccination. Offering COVID-19 vaccination at discharge can reduce barriers to vaccination and target patients at high risk for severe illness and death. We evaluated a COVID-19 vaccine intervention implemented as part of routine discharge planning. Methods: We trained healthcare personnel during April 2021 to review and document vaccine eligibility and interest for adult inpatients on medical, surgical, or psychiatric wards at the Atlanta VA Medical Center during discharge planning using a templated note in the electronic medical record (EMR). Outpatient vaccination center personnel were deployed to the participating wards daily (except Sundays) to facilitate vaccine administration at discharge. We measured the percentage of discharged patients with vaccine eligibility documented using the template and compared the number of patients vaccinated at discharge in the 4 weeks pre- and post-training. All Georgia adults became eligible for COVID-19 vaccines on March 25, 2021, prior to our intervention. Results: Of the 769 patients discharged from one of the participating wards during the 4-week post-training, 474 (62%) had vaccine eligibility documented (Table 1). Of the 474 patients with documentation, 88 (19%) were eligible. Reasons for ineligibility included prior vaccination (n=266, 69%), patient refusal (n=103, 27%), and acute COVID infection (n=12, 3%). Of the 88 eligible patients, 61 (69%) received vaccination before discharge. In total, 16 of 793 inpatients in the pre-training period and 61 of 769 in the post-training period (2% vs 8%; p<0.05) were vaccinated prior to discharge. Discussion: We found relatively high and sustained uptake of an intervention to screen hospitalized patients for COVID-19 vaccination eligibility. Creating a templated note in the EMR resulted in vaccination of nearly 70% of eligible patients prior to hospital discharge.
Understanding the role children play in the transmission of SARS-CoV-2 has been a challenge due to undertesting in children, school closures, and a high proportion of asymptomatic pediatric infections. Furthermore, SARS-CoV-2 household transmission studies have ranged in methodology and outcomes, with some concluding that children are not drivers of transmission. However, with the opening of schools, rise of pediatric cases, and more infectious variants, it is crucial to better understand household transmission. Households were recruited from December 2020 to August 2021 and were identified through individuals who tested positive for SARS-CoV-2 infection at Emory Healthcare, Kaiser Permanente of Georgia, or through study advertisements. Eligible households had at least one member under the age of 18 years and at least one SARS-COV-2 positive infection 6-16 weeks prior to the study visit. Saliva samples were collected and tested on a multiplexed platform for IgG antibodies that bind to the SARS-COV-2 RBD and nucleocapsid (N) proteins. Individual and household surveys included questions on demographics, symptoms, exposures, timelines, and isolation precautions. Forty-two households were enrolled as of August 2021. On analysis of the first 18 families, a mean secondary infection rate (SIR) of 55% and median secondary infection rate (SIR) of 67% (range 0-100%) were found. Children comprised 3 out of 18 index cases and were associated with in-person school or sports. Two were associated with a higher than average household secondary infection rate. Children and adults had similar infection prevalence (63% vs 77%) and wearing a mask in the house was not associated with a lower SIR. Antibody results uncovered 11 infections that were not detected previously. While additional results forthcoming, our initial data demonstrated a high SIR in early 2021, children who both acquired infection in the household and those who resulted in multiple household infections. School mitigation procedures are necessary to prevent transmission and protect vulnerable household contacts.
Group III: Health disparities, health equity, & vulnerable populations

9:15 – 9:21 am
#31 – Achieving research justice and inclusivity: Identification of refugees & immigrants in electronic health records
Matthew Dudgeon, Yaffee A, Zeidan A

Background: Refugees and immigrants face multiple barriers to healthcare, yet patterns of healthcare utilization are poorly understood. Difficulties in identifying refugees and immigrants in electronic health records (EHRs) and national data sets present obstacles to obtaining data on health outcomes. This study evaluates ethical and appropriate methods for identifying refugees and immigrants in EHRs within two academic healthcare systems in Atlanta, Georgia. Methods: We conducted semi-structured qualitative interviews with key informants to explore methods of identification of refugees and immigrants in EHRs. Interviews were conducted via recorded video, transcribed, and coded by two independent study team members for thematic analysis. Results: 14 key informant interviews and 12 patient interviews were completed. Key informants identified as community leaders (3), healthcare providers (7) and professors/researchers (4) with an average of ~13 years of experience working with refugee/immigrant communities. Results: Participants reported a number of characteristics for identification including preferred language, country of origin, and time in the U.S. but noted that these may be inadequate for subgroup identification without additional attention to migration narratives. Themes also emerged around the approach for obtaining information, highlighting the need for trust and rapport building when recording information. Discussion: Key informant interviews characterized the complexity of using EHRs to identify refugees and immigrants but suggested a number of characteristics and approaches to consider. Further research with refugee and immigrant populations on identification using EHRs is ongoing and warranted. Author Disclosure: The authors endorse no conflicts of interest.

9:21 – 9:27 am
#39 – An innovative approach to career development of diverse faculty
Jones D, Shelley Fluker, Walker TA, Manning KD, Bussey-Jones JC

Problem: Women and persons from racial and ethnic populations underrepresented in medicine (URiM) comprise a substantially lower proportion of academic internal medicine faculty, particularly at senior ranks (associate professors and professors). Numerous factors lead to this inequity which has broad implications for medical education and healthcare. Approach: In 2013, the Emory University Division of General Internal Medicine Grady Section (GIMG) formed the Faculty Review Committee (FRC) to address low promotion rates to senior ranks in aims of creating an inclusive, equitable environment. The FRC systematically reviews all GIMG faculty and provides tailored recommendations to bolster professional development and expedite promotion. To evaluate FRC efficacy, the authors compared de-identified GIMG academic rank data with aggregate data from the Emory University School of Medicine (EUSOM) and the American Association of Medical Colleges (AAMC). Outcomes: In 2020, GIMG had significantly more senior faculty compared with AAMC (RR: 1.30, 95% CI: 1.01–1.68) and EUSOM (RR: 1.54, 95% CI: 1.19–2.00). This was consistent in a subgroup analysis of women GIMG senior faculty compared with AAMC (RR: 2.01, 95% CI: 1.55–2.61) and EUSOM (RR: 3.12, 95% CI: 2.36–4.14). A non-significant trend towards increased URiM senior faculty in GIMG was also seen compared with AAMC and EUSOM but was limited by sample size. Next Steps: The authors demonstrate that the FRC, a standardized and systematic process, led to more GIMG faculty in senior ranks than institutional and national comparators. A significant increase in the promotion of women faculty and a trend towards an increase of URiM faculty was seen, an important effect as equitable academic medicine environments can foster a more diverse workforce and improve patient outcomes. Next steps include investigating the FRC’s impact on job satisfaction, retention, and productivity and studying its effects and reproducibility by scaling beyond GIMG.
9:27 – 9:33 am  
**#67 – Unfavorable clinical outcomes with polymyxins compared to ceftolozane/tazobactam for the treatment of carbapenem-resistant Pseudomonas aeruginosa**  

Background and Aims: Patients with carbapenem-resistant Pseudomonas aeruginosa (CRPA) have high mortality rates. This study aims to determine if patients with CRPA treated with ceftolozane/tazobactam (C/T) have better outcomes than those treated with polymyxins.

Methods: The CDC-funded, Georgia Emerging Infections Program performed active population- and laboratory-based surveillance for CRPA from sterile sites, urine, lower respiratory tract and wounds in metropolitan Atlanta, GA from 8/1/2016–7/31/2018. We included adults without cystic fibrosis, hospitalized within 1 week of CRPA culture. Using a desirability of outcome ranking (DOOR) analysis we estimated the probability that a patient treated with C/T would have a more desirable outcome than a patient treated with polymyxins. We adjusted for confounding using inverse probability of treatment weighting based on culture source and need for dialysis.

Results: Among 710 cases from 18 different hospitals, we identified 73 patients treated for CRPA infections with polymyxins (n=31) or C/T (n=42). Most patients were male (64%) and Black (80%). Those receiving polymyxins were more likely to need dialysis at baseline (35% vs. 14%, p=0.03). At 30 days after culture, 34 (47%) were alive with no adverse events, 21 (29%) were alive with ≥1 adverse event, and 18 (25%) died. Patients treated with C/T had a lower 30-day mortality rate than those treated with polymyxins (14% vs 39%, p=0.03). Additionally, those receiving C/T had better overall clinical outcomes, with an adjusted DOOR probability of 67% (95% CI 53%–80%) compared to those receiving polymyxins (Figure 1).

Conclusions: These findings support the recent Infectious Diseases Society of America guidance favoring C/T over polymyxins for treatment of CRPA infections.

9:33 – 9:39 am  
**#82 – A successful model of diversity and inclusion in Team Science increased research productivity among hospitalists engaged in COVID-19 research**  
Ketino Kobaidze, Franks N, Jasmah H, Wiley Z, The CROSS study group

AIM: Increase the participation of Black, Indigenous, people of color (BIPOC), and women in research through intentional recruitment for research project participation. Background: Ethnic, gender and racial diversity benefits research teamwork and enhances innovations. Team science provides an opportunity to leverage a collaborative and cross-disciplinary approach to increasing diverse representation in research.

Methods: The CROSS team studying COVID-19 disease characteristics, risks for readmissions, outcomes, and social determinants of health. The team was created in June 2020. Several surveys conducted to record team demographics, desired levels of participation and job allocation. Results: Total of 37 members participate in CROSS research, 78 % are women, and 60 % identify as BIPOC women from Emory Healthcare/University (81%), Morehouse School of Medicine (10%), Kaiser Permanente (5.4%), and Atlanta VAHCS (2.7%). Medical school ranks represented: Professor (3%), Associate Professor (16 %), Assistant Professor (32 %), and learners (14 %), other (37%). Desired participation of respondents were strategized for task allocation (figure1). The team successfully produced 17 abstracts, three oral presentations, five grant submission, and invitations to larger research collaborations.

Conclusion: Our team created a unique mentorship opportunity that resulted in multiple presentations at the local and national levels. Team members were encouraged and guided to participate in larger research studies and grant writing. Early engagement survey identified each participants’ focus for commitment and was used for task allocation. The research group serves as an excellent Blue Sky initiative for collaboration amongst various divisions, hospitals and medical schools. The CROSS project especially significant for hospital medicine faculty since it fosters scholarships and sets prospective for academic advancement.
#47 – Perinatal HIV care during the COVID-19 pandemic: A qualitative study of closing the gap with mobile healthcare

Background: The COVID-19 pandemic risks worsening disparities for women with HIV (WWH) and their infants, but also presents opportunities for care delivery innovation. Due to COVID-19, the Grady Health System Mobile Integrated Health (MIH) unit implemented a modified perinatal and infant appointment schedule of multidisciplinary home visits as an alternative to standard clinic-based care. We evaluated barriers and facilitators to program implementation. Methods: Guided by the Consolidated Framework for Implementation Research, we conducted in-depth interviews with 17 providers and 12 patients who participated in the MIH program from Sept 2020-Jun 2021. Our thematic analysis included an iterative, team coding approach combining deductive and inductive elements. Results: The MIH program was highly acceptable among participants, who noted that the program offered a safer solution and alleviated childcare and transportation challenges that were exacerbated during the pandemic. We identified the following implementation facilitators: MIH fit with patient and clinic needs, ease of referral, provider adaptability, and existing patient-provider relationships. Cited barriers were related to program logistics: scheduling complexity, lack of clarity on offered services, limited access to portable computer devices and internet connectivity for documentation, and unclear follow-up procedures. Conclusion: This novel HIV/obstetric care program during the pandemic fills a critical gap in care delivery for pregnant WWH and their infants. While the program was viewed favorably, we identified important, addressable barriers to implementation. The evaluation led to programmatic improvements and continues to inform MIH implementation, facilitating its potential to serve as a model of multidisciplinary mobile healthcare.

#17 – A comparative analysis of sociobehavioral outcomes among transgender women in Atlanta living with and without HIV
Srinidhi Bharadwaj, Das S, Peng L, Schneider JS, Haw JS

Background and Aims: In the United States, transgender women (TW) are disproportionately burdened by HIV infection. Geographically-focused cohort studies can help determine unique needs for TW. This study aims to describe baseline characteristics and compare prevalence of HIV-related resource access and behaviors among TW participants in the Leading Innovation for Transgender Women’s Health and Empowerment (LITE) in Atlanta. Methods: Participants were recruited via convenience sampling and enrolled in a baseline study visit which included a sociobehavioral survey and STI testing. Descriptive statistics were calculated for demographic variables. Logistic regression analyses assessed the association between HIV status and resource access and behaviors. Results: Of 131 participants, 37.4% (n=49) live with HIV and 62.6% (n=82) live without HIV. The odds of living with HIV among TW with access to support groups was 9.98 (CI95%: 3.25-30.7) times the corresponding odds among TW without access to support groups, after controlling for age and race. The odds of living with HIV among TW with access to condoms was 9.41 (CI95%: 3.22-27.5) times the corresponding odds among TW without access to condoms, after controlling for age and race. Meanwhile, the odds of living with HIV among TW expressing suicidal ideation was 0.259 (CI95%: 0.110-0.611) times the corresponding odds among TW not expressing suicidal ideation, after controlling for age and race. Conclusions: Greater access to social support and HIV prevention resources like condoms appears more common among TW living with HIV, while experiencing mental health disorders appears more common among TW living without HIV. These data underscore the importance of allocating more social services and healthcare resources to TW living without HIV.
9:57 – 10:03 am
#52 – Single center study for improving Hepatitis A & B immunity in veterans with cirrhosis

Introduction: Patients with cirrhosis should be immunized against hepatitis A (HAV) & hepatitis B (HBV) as they are high risk for decompensation if infected. Baseline data at the Atlanta VA hepatology clinics showed 75% of veterans with cirrhosis were immune to HAV and 44% to HBV. Our aim was to reduce missed opportunities to initiate HAV and HBV vaccination to <10% and to confirm immunity with serologies to <10% over 6 months. Methods: A process map identifying steps to obtain a vaccine and Pareto charts of commonly identified barriers were used to implement Plan-Do-Study-Act (PDSA) cycles. Approximately every 10th chart was sampled, and P charts were created using the average missed opportunity rate. Results: PDSA 1 focused on educating providers and sharing baseline data. For PDSA 2, the liver pharmacist monitored the vaccine queue daily to ensure orders remained active. PDSA 3 involved a “quality inspection” by the attending hepatologist, who alerted providers if vaccination was not addressed when warranted. The last PDSA utilized a “Liver Passport” with personalized vaccination, hepatocellular screening, and esophageal variceal screening recommendations. The missed opportunities for HAV & HBV vaccination and serologic confirmation testing decreased from 41% to 29%. The missed opportunities for initiating HAV & HBV vaccination decreased from 25% to 19% and assessing immunity with HAV & HBV serologies declined from 16% to 10%. Discussion: Lack of in-person visits during the pandemic was a significant limitation early on. Nevertheless, the discussion around COVID-19 vaccines provided a springboard for our initiatives to increasingly address HAV & HBV immunity. Future aims are >90% HAV and HBV immunity and addressing all other vaccines recommended in patients with cirrhosis.

10:03 – 10:09 am
#98 – Comorbidity burden is associated with hospitalization for Covid-19 among persons with HIV
Caitlin Moran, Oliver NT, Szabo B, Collins LF, Nguyen MT, Shah NS, Moanna A, Colasanti JA, Cantos VD, Armstrong WS, Sheth AN, Ofotokun I, Kelley CF, Marconi VC, Lahiri CD

Background: The contributions of non-AIDS comorbidities and HIV-related factors to COVID-19 outcomes in persons with HIV (PWH) are unclear. We identified risk factors for COVID-19 hospitalization in PWH. Methods: We evaluated all PWH >18 years with a positive SARS-CoV-2 PCR in a public safety-net hospital, a Ryan White-funded HIV clinic and a Veterans Affairs medical center in Atlanta, GA from March 1, 2020 to November 15, 2020. Baseline characteristics and COVID-19 outcomes were ascertained by medical record abstraction; multivariable logistic regression was used to determine associations with COVID-19 hospitalization. Results: 180 patients (mean age 49, 78% male, 78% Black) were included. 97% were on antiretroviral therapy (ART), 91% had HIV-1 RNA <200 copies/ml, mean CD4 count was 527 cells/mm3. 60 patients were hospitalized, of which 28 required supplemental oxygen. 130 patients (72%) had at least 1 non-AIDS comorbidity; 22% had >4 comorbidities. In univariable models, age, hypertension, dyslipidemia, diabetes, heart disease, and chronic kidney disease were associated with hospitalization; CD4 count, viral load and ART were not. After adjusting for the above covariates, age [aOR(95%CI)1.07(1.04-1.11), p=0.0001] and diabetes mellitus [aOR(95%CI)2.65(1.03-6.85), p=0.044] were associated with hospitalization. In a separate model adjusted for age comorbidity count was associated with 25% greater odds of hospitalization [aOR(95%CI)1.25(1.01-1.53), p=0.038] and >4 comorbidities were associated with 2.8-fold greater odds of hospitalization than 0-1 comorbidities [aOR(95%CI)2.85(1.17-6.91), p=0.024]. Conclusion: In PWH with COVID-19 age and non-AIDS comorbidities were associated with COVID-19 hospitalization. Further research into causes of severe COVID-19 in PWH is warranted.
Group IV: Case reports - Unusual management or complications

9:15 – 9:21 am
**#15 – Left atrial appendage thrombus as a nidus for persistent Bacillus pumilus bacteremia**
Omid Behbahani-Nejad, Amratia A, Rollin F

Left atrial thrombus is a well described complication of atrial fibrillation, especially when not on chronic anticoagulation. Left untreated, they carry high risk for systemic thromboembolism. There is a limited evidence on cardiac thrombi serving as a nidus for infection. Notably, some cases have required surgical excision of infected thrombi for source control. A high index of suspicion is required for early recognition of infected cardiac thrombi to prevent catastrophic complications. 62-year-old male with chronic systolic heart failure (EF < 25%), atrial fibrillation, and h/o left atrial appendage thrombus (which had resolved on prior imaging). He was unable to fill his medications (including a DOAC) due to financial barriers. Patient initially presented with worsening peripheral edema, dyspnea, and palpitations. They were admitted for heart failure optimization. Initial Physical Exam: T: 97 F, BP: 119/98, HR: 150-180, RR: 24, O2: 95% JVD to mandible, abdominal and LE edema. Irregular and tachycardic rhythm, cool lower extremities with palpable pulses bilaterally. Left great toe with purple discoloration without ulceration or purulence. Blood cultures on hospital day 9: -2 out of 2 bottles with Bacillus pumilus. Repeat blood cultures persistently grew Bacillus pumilus, despite adequate antibiotic treatment. Blood cultures sterilized after 13 days of antibiotics and 21 days of rivaroxaban. ADHF: IV diuresis, reintroduction of rivaroxaban, digoxin, BB, and home diuretic (once euvoletic). Hospital Day 9: Febrile/Septic. Blood cultures grow Bacillus pumilus. ID c/s. IV vancomycin and ceftriaxone initiated. Susceptibilities lead to vancomycin monotherapy. Persistent bacteremia, concern for poor source control. Imaging: MRI abdomen was unremarkable. Whole-body PET: uptake in L great toe, R knee, lungs, mediastinum. MRI L foot: 1st, 2nd, 4th, 5th metatarsal head infaracts. CT Chest: patchy opacities, cystic regions (c/f septic emboli), thrombus in LAA and LV apex. TEE Two thrombi in LAA. No vegetations. CTS c/s: conservative management given comorbidities. Blood cultures sterile on Day 13 of IV antibiotics. Discharged to SAR on lifetime Xarelto w/ plan for 4 weeks IV vancomycin followed by 2 weeks of IV linezolid. Patient left AMA on day 1 at SAR. Consider inadequate antibiotics AND source control in settings of persistent bacteremia. This case shows that cardiac thrombi can serve as an etiology of persistent bacteria by acting as a nidus for infection. Consider surgical evacuation of infected cardiac thrombi if patient is a surgical candidate, as well as anticoagulation. An extended period of antibiotics combined with anticoagulation therapy are indicated in cases of infected cardiac thrombii.

9:21 – 9:27 am
**#23 – A pair of diaphragm-crossed organs: A pancreatico-pericardial fistula**
Lena Chu, Pelling MM, Patel KJ, Brown MT, Aldredge AA

Introduction: Pseudocysts are a known complication of chronic pancreatitis, occurring in 30-40% of patients. They form when disruption of the pancreatic duct system creates fluid-filled pockets with high concentrations of digestive enzymes. Leakage of these enzymes can create pancreatic fistulas. Here, we present a case of an unusual fistula that occurred in an immunocompromised individual. Case Description: A 34-year-old man with a history of Acquired Immunodeficiency Syndrome, alcohol use disorder, and chronic pancreatitis who had recently recovered from acute pancreatitis complicated by pericardial effusion was readmitted with worsening pleuritic chest pain and shortness of breath. He was hemodynamically stable with a normal cardiopulmonary exam without jugular venous distention or pulsus paradoxus. Labs were at his baseline other than an elevated d-dimer level. Computed tomography scan revealed a large, loculated pericardial effusion with a fistula extending through the diaphragm to a large peripancreatic pseudocyst. Gastroenterology performed pancreatic ductal stenting via endoscopic retrograde cholangiopancreatography and Interventional Radiology placed a percutaneous drainage catheter to facilitate resolution of the pseudocyst. Discussion: A pancreatico-pericardial fistula is a very rare complication of chronic pancreatitis. A 2016 review detailed only fifteen cases over a 40-year span with surgical management providing the best outcomes. Given this patient’s immunocompromise and malnutrition surgery was not offered, but endoscopic stenting and percutaneous drainage allowed for successful resolution of his fistula.
9:27 – 9:33 am
#81 – Breathless and going blind: A case of COVID-19 pneumonia with an incidental prolactinoma
Amy Kim, Zhuang TZ, Pressman A, Shin YM

COVID-19 is believed to have an impact on patients with pituitary disease, both through delayed care and direct impact on hormone levels complicating appropriate management. Our patient, a 51-year-old male diagnosed with COVID-19, presented with shortness of breath and hypoxia. History revealed blurry vision, peripheral vision loss, headache and low libido. The patient had a known pituitary mass that was previously diagnosed but had not yet undergone definitive workup. On arrival, oxygen saturations were at 88% on room air (which improved with 3L O2 nasal cannula supplementation), and he had bibasilar lung crackles. Vital signs and physical exam were otherwise unremarkable. Chest X-ray showed reduced lung volumes and bibasilar opacities, and brain magnetic resonance imaging (MRI) showed a 2 cm macroadenoma with compression and thinning of the optic chiasm. Endocrinology and neurosurgery were consulted. Further laboratory studies showed an elevated prolactin of 845 ng/mL with a dilutional prolactin of 900 ng/mL; the patient also had decreased follicle stimulating hormone and luteinizing hormone of <1 mIU/mL and a slightly elevated morning testosterone of 267 ng/dL. Thyroid and insulin-like growth factor studies were normal. Adrenocorticotropic hormone and cortisol levels were uninterpretable as the patient was receiving dexamethasone for COVID-19 pneumonia. He was started on cabergoline and was pending visual field testing. Surgery was deferred due to COVID-19 infection. It is unclear how to best manage patients with pituitary tumors with concomitant COVID-19, but conservative or medical management remains an appropriate option for those with active COVID-19 disease.

9:33 – 9:39 am
#84 – A case of acute vision loss from Neuromyelitis Optica due to Covid-19 infection
Kieran A. Kristensen, Coleman CG, DeCaro S, Chun E

A 50-year-old male presented to a Georgia hospital with left eye pain and vision loss that had developed gradually over the past six days. His eye pain worsened with movement, was preceded by mild headaches posterior to the affected eye and was unaffected by eye drop use. Review of systems was otherwise negative. He had been diagnosed with COVID-19 after experiencing myalgias two weeks earlier but had recovered prior to presentation here. His exam revealed left conjunctival injection and severely diminished visual acuity in that eye but was otherwise unremarkable. Brain MRI revealed asymmetric enlargement and enhancement of the left optic nerve consistent with optic neuritis, and CSF analysis was positive for MOG IgG. Other serologies, including AQP4 Ab, ESR/CRP, HIV, RPR/Treponemal Ab, ACE, Bartonella and Lyme were negative and lab results were unremarkable. The patient’s vision gradually returned after five days of IV methylprednisolone, with fully intact vision at discharge. He presented again roughly 1 month after discharge with the same symptoms and had virtually identical lab and imaging findings and again recovered with IV steroids. This patient’s presentation was consistent with Neuromyelitis Optica Spectrum Disorders (NMOSD), a collection of autoimmune demyelinating diseases that present with neurologic symptoms including optic neuritis and transverse myelitis. They are associated with a personal or family history of autoimmune disease and are thought to be triggered by infectious insult and mediated by antibodies such as anti-AQP4 and anti-MOG IgG. While specific triggers for NMOSD’s are often difficult to pin down, this case illustrates that COVID-19 infection could be considered as an etiology in patients presenting with acute vision loss of uncertain cause.

9:39 – 9:45 am
#83 – EUS-guided radiofrequency ablation of a Pancreatic Tail Insulinoma

Introduction: Insulinomas are the most common pancreatic neuroendocrine tumor (PNET). Originating from islet beta cells, they secrete excessive insulin and cause recurrent hypoglycemia. Endoscopic ultrasound (EUS) can assist in preoperative localization and biochemical sampling of suspected lesions. The standard of care for PNETs is surgical resection. However, some patients are deemed high-risk for surgery or refuse surgery as an option. EUS-guided radiofrequency ablation (RFA) provides a less invasive modality for treating PNETs. A case Description: A 90-year-old patient presented with several years of recurrent hypoglycemic episodes. Insulin and C-peptide levels were elevated. CT abdomen revealed a 1.7 cm x 1.0 cm enhancing lesion in the pancreatic tail. An EUS fine needle aspiration confirmed an insulinoma. The patient
elected for EUS-RFA procedure. A 7.5MHz linear echoendoscope was used to identify the lesion in the pancreatic tail. An intact interface between the mass and adjacent structures suggested a lack of invasion. Doppler was used to confirm the absence of adjacent vascular structures. A 19G EUS-RFA needle was advanced through the linear echoendoscope into the lesion. Eight total ablations were applied. A bubbling effect was confirmed in the tumor region. The patient did not exhibit signs of secondary pancreatitis and was discharged two days after the procedure with stable serum glucose and normalized insulin and C-peptide levels. Discussion: EUS radiofrequency ablation offers a less invasive option for treating pancreatic tail insulinomas. Procedures can be performed in under an hour with minimal post-procedural observation and clinically significant outcomes for patients.

9:45 – 9:51 am
#148 – A rare case of Kaposi sarcoma-immune reconstitution inflammatory syndrome: the double-edged sword of antiretroviral therapy initiation

A 28-year-old man from Central America with HIV presented with two months of progressive shortness of breath. Physical exam was remarkable for anasarca, diffuse cutaneous purpuric plaques and respiratory crackles. Skin biopsy confirmed cutaneous Kaposi sarcoma (KS); bronchoscopy and MRI were suggestive of pulmonary and hepatic metastases. Anti-retroviral therapy and docetaxel were initiated. He then developed progressive distributive shock requiring aggressive hemodynamic support, as well as respiratory failure eventually requiring intubation. Repeated infectious workup was negative. Despite aggressive cardiopulmonary support, he succumbed to distributive shock. We describe a case of pulmonary KS-immune reconstitution inflammatory syndrome (IRIS). Initiating antiretroviral therapy in patients with AIDS can sometimes result in a systemic immune response. This phenomenon, known as IRIS, is typically associated with tuberculosis, cryptococcal meningitis, and cytomegalovirus retinitis. While rare, patients with extensive tumor burden from KS can experience IRIS that can clinically manifest as undifferentiated shock. This unusual condition is defined as ≥2 of the following: an abrupt increase in number of biopsy-proven cutaneous lesions, appearance or exacerbation of lung-opacities or lymphedema, concomitant increase in CD4 cell-count ≥50 cells/mm3, and a decrease of >1 log in viral-load once started on therapy. While initiation of therapy is associated with positive outcomes in KS, patients experiencing KS-IRIS have a high mortality rate. This case describes the rare but clinically significant phenomenon of KS-IRIS and highlights the possibility of paradoxical decompensation despite therapy.

9:51 – 9:57 am
#122 – Endoscopic necrosectomy using novel rotational microdebridement in a patient with hydrogen peroxide hypersensitivity
Kevin Shah, Messallam AA, Patel VA, Chawla S, Keilin SA, Cai Q, Willingham FF

Introduction: Necrotizing pancreatitis is a rare form of acute pancreatitis associated with high rates of morbidity and mortality. Case Presentation: A 43-year-old male with history of acute cholecystitis status-post cholecystectomy presented with severe abdominal pain, nausea, and vomiting. MRI revealed necrotizing pancreatitis complicated by walled-off necrosis (WON). Given his clinical stability, he was managed conservatively. Two months later, the patient presented with worsening abdominal pain and CT revealed maturation of the WON. The patient underwent cystgastrostomy with placement of a lumen apposing coaxial metal stent followed by multiple standard endoscopic necrosectomies. However, necrosum remained adherent within the pancreatic cavity and the patient was found to have a hydrogen peroxide hypersensitivity, limiting its use for debridement. After multidisciplinary review, the patient underwent necrosectomy with an off-label approach using a rotational microdebriderment device. This device dissects, resects, and collects tissue simultaneously with auto-irrigation to mobilize necrosum and remove it with vacuum suction. At one-month follow-up, the patient had full improvement in symptoms. He was no longer diabetic, was off pain medications, and could tolerate intake by mouth. Resolution was confirmed endoscopically revealing a clear cavity with viable granulation tissue throughout. Discussion: This novel technique of using a rotational microdebriderment device for endoscopic necrosectomy offers a minimally invasive adjunct for the management of severe necrotizing pancreatitis complicated by WON. For our patient, this approach also had the advantage of avoiding hydrogen peroxide, which is commonly used in traditional endoscopic necrosectomies for debridement.
9:57 – 10:03 am

#13 – Oncologic emergency: Fatal type B lactic acidosis associated with metastatic rectal carcinoma
Hopkins BD, Samridhi Banskota, DiFrancesco L

Type B lactic acidosis is a rare and often fatal complication associated with malignancy. With less than 100 reported cases in literature, and less than 30 reported cases associated with solid tumors, early recognition and management is challenging and ill-defined. A 60-year-old male with metastatic rectal adenocarcinoma with liver metastasis and chronic kidney disease stage IV presented to the hospital after being found to have recurrent hyperkalemia at a clinic visit. Patient was diagnosed with cancer 10 weeks prior with upcoming chemotherapy. Abdominal exam was notable for distention with a tender hard palpable mass spanning from the right to left upper quadrant. Laboratory findings revealed a K+ level of 6.1 meq/L with an anion gap of 20, BUN 47 mg/dL and serum Cr 1.8 mg/dL. No EKG changes of hyperkalemia were found. Intravenous insulin with dextrose and oral lactulose was administered in the emergency room. The next day his K+ was 5.9 meq/L and a lactic acid (LA) level of 7.7 mmol/L was found. Bicarbonate therapy was initiated. Medical oncology was consulted and recommended a delay in initiation of his palliative chemotherapy due to nosocomial fever and tachycardia on hospital day 4. His LA levels up trended to and peaked at 15 mmol/L on hospital day 5. On day 7, the patient developed uremic encephalopathy and his family decided to transition him to inpatient hospice care. The patient died on hospital day 11. Lactic acidosis in the setting of malignant solid tumors portends a fatal prognosis. This case illustrates the need for more awareness of this oncologic emergency, as early chemotherapy is likely the only intervention with any survival benefit.

10:03 – 10:09 am

#124 – Say what? A case of otosyphilis reveals a new diagnosis of HIV
Ho J, Yoo Mee Shin, Willis MD, Witt LS, Kobaidze K

Case: A 57-year-old man with a history of hypertension, Type II diabetes and no history of sexually transmitted infections presented with a two-month history of sudden onset bilateral hearing loss and one-week history of vertigo. Prior to symptom onset, he reported allergy symptoms including congestion and ear fullness. He was evaluated as an outpatient by Otolaryngology, who noted bilateral sensorineural hearing loss (SNHL). Magnetic Resonance Imaging revealed asymmetric right greater than left abnormal enhancement involving the cochlea and the vestibule and abnormal focal enhancement in the left greater than right internal auditory canal. He was admitted to a prednisone taper. Laboratory workup revealed negative autoimmune studies including antinuclear antibody (ANA) test and acute hepatitis serologies. Serum rapid plasma reagin (RPR) titer was 1:128 with positive syphilis IgG and IgM. He was admitted to the hospital. Lumbar puncture was performed, and cerebrospinal fluid (CSF) studies showed an elevated protein and reactive VDRL. Further workup revealed positive fourth generation HIV antigen/antibody test with a CD4 cell count of 631 cells/dL and HIV-1 RNA viral load of 54,900 copies/mL, representing a new diagnosis of HIV. Upon admission the patient had described his sexual encounters as limited and heterosexual, however upon further discussions he endorsed anal intercourse with men. Treatment was initiated with 24 million units of IV penicillin G daily for 14 days and antiretroviral therapy. Upon follow-up, he noted improvement in vertigo and hearing in left ear but had continued hearing loss on the right. Discussion: Hearing loss is a common problem encountered by general internists and carries a broad differential. Sudden SNHL narrows the differential to ototoxic drugs, infections, neoplasms, autoimmune diseases, vascular disorders, and trauma. Otosyphilis is a rare complication of syphilis, the sexually transmitted infection caused by Treponema pallidum. Otosyphilis is a type of neurosyphilis and can occur at any stage of a syphilis infection. Otosyphilis is an unusual cause of SNHL and hearing loss can be unilateral or bilateral. Additional symptoms may include tinnitus or vestibular abnormalities such as vertigo, imbalance, or gait instability. Treatment of neurosyphilis (including otosyphilis) includes penicillin G 3-4 million units IV every four hours (or 18-24 million units continuous IV infusion) for 10-14 days. After treatment, patients may show improvement in hearing but may not return to their hearing baseline. Conclusion: The general internist should be keenly aware of the symptoms of syphilis, especially neurosyphilis, and consider it in the diagnosis of new onset SNHL. Our case identifies another key aspect of syphilis infection, which is the co-infection with HIV. As syphilis increases susceptibility to HIV acquisition 3,4, those with a new syphilis diagnosis require concurrent HIV testing.
Group V: Covid-19 treatment & clinical outcomes

9:15 – 9:21 am

#114 – Exploring memory response to Covid infection in healthy and autoimmune individuals
Oindrila Rahaman, Woodruff M, Lee FEH, Sanz I

Aim: The disease pathogenesis of systemic lupus erythematosus (SLE) is characterized by the expansion of extrafollicular pathway derived B cells, and recent work uncovers the dominance of this extrafollicular pathway in severe COVID-19 infection as opposed to mildly infected. We aimed to investigate the memory response to COVID-19 infection in mild versus severe infected individuals and SLE patients with a background of predominant extrafollicular B cell activation.

Methods: Antigen-specific staining was carried out on thawed PBMCs from covid recovered subjects using COVID-19 antigen probes, followed by staining for surface markers of B lymphocytes. Stained cells were acquired on Cytek Aurora flow cytometer, and data was analyzed by FlowJo v10.8 software.

Results: Individuals with mild COVID-19 infection showed higher COVID-antigen specific B cells compared to individuals with severe infection, and this was further reduced in SLE patients. The COVID-antigen specific CD27+ memory compartment was highest in the mild group. DN2 and DN3 subsets remained expanded in severe group at day30-day60 post infection. In severe group and SLE patients, we found prominent antigen-specificity in the DN (double-negative) compartment, specifically in the DN2 and DN3 subsets. Antigen-specific DN2 and DN3 compartments persisted even at a later time-point post infection in SLE patients.

Conclusions: Germinal center reaction to infection, leading to predominant generation of CD27+ memory B cells seems to be reduced in individuals contracting severe COVID infection and in individuals with SLE. On the other hand, effectors of extrafollicular pathway, DN2 and DN3 were prevalent in frequency and antigen-specificity in severe group and SLE, and these persisted at late-time in SLE.

9:21 – 9:27 am

#10 – Inflammation of SARS-CoV2-infected human pluripotent stem cell-derived cardiomyocytes and the effects and side effects of Remdesivir

Introduction: The global pandemic of the coronavirus 2019 disease (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). In addition to respiratory failures, COVID-19 patients exhibited cardiac complications. Studies observed the direct infection and replication of SARS-CoV2 in human pluripotent stem cell-derived cardiomyocytes (hPSC-CMs) accompanied by cytopathic effects. However, the underlying mechanisms of SARS-CoV2-mediated CM death remain poorly understood. In addition, the therapeutic potential of remdesivir (RDV) on CMs has yet to be answered.

Methods and Results: We confirmed that SARS-CoV2 is infectious to and effectively replicates in hPSC-CMs and is cytopathic to hPSC-CMs. We also found that RDV effectively inhibited viral replication at a concentration of 50 nM. RNA-seq analyses demonstrated that expression of immune responsive genes was elevated in SARS-CoV2 infected hPSC-CMs. Immunostaining and an ELISA assay further revealed formation of inflammasomes and secretion of inflammasome-mediated cytokines, such as IL-1β, IL-18, and IL-6 in SARS-CoV-2 infected hPSC-CMs. RNA-seq analyses showed gene profile changes in SARS-CoV-2 infected hPSC-CMs corroborating with activation of inflammatory signals and cell death pathways. While gene profiles of 0.1 μM RDV-treated SARS-CoV-2-infected hPSC-CMs showed reversal of such changes, a high dose (10 μM) RDV-treated CoV2-infected hPSC-CMs showed changes in 44% of genes expressed compared to non-RDV-treated SARS-CoV2-infected hPSC-CMs. Among those, expression of protein stability related genes, such as genes associated with autophagy and protein ubiquitination increased while expression of antiviral responsive genes decreased. In addition, a high dose of RDV inhibited expression of mitochondrial genes, particularly components of MitoComplex I and V, which are related to energy production.

Conclusions: This study demonstrates that SARS-CoV2 induced inflammasome in hPSC-CMs, which can underlie cardiac damage in addition to direct cytopathic effects. In addition, RDV can reduce inflammasome when introduced early after SARS-CoV2 infection while a high-dose can aggravate cytopathic effects by potential toxicity to mitochondria.
9:33 – 9:39 am
#143 – Clinical autoreactivity is common in severe SARS-CoV-2 infection
Matthew Woodruff, Ramonell RP, Rudolph M, Lee FE, Sanz I

Background: Our recent work described extrafollicular B cell responses in patients with severe COVID-19 resembling patients with active autoimmune disease. While several studies have now shown individual autoreactivities in these patients, a broad assessment of clinical autoreactivity has not yet emerged. Methods: Blood plasma was collected from healthy donors (n = 15), outpatients with COVID-19 (n = 18), and critically ill subjects with COVID-19 (n = 26) and tested for a variety of autoimmune serologies. Further testing was retrospectively evaluated in 52 critically ill patients with COVID-19 who had autoimmune serologies ordered by their treatment team during ICU care in two academic ICUs in Atlanta, Georgia. Results: The prospective cohort displayed frequent breaks in tolerance in critically ill subjects compared to healthy donors. While anti-dsDNA levels were negligible, critically ill patients displayed high numbers of positive tests against anti-nuclear antigens (11/26) and carbamylated proteins (12/26). In addition, we identify the targeting of glomerular basement membrane (2/26) suggesting potential pathology in the lung and kidney. Analysis of the independent, retrospective cohort largely confirmed these findings, with more than half (27/52) testing positive for at least one autoreactive target. Conclusions: Our findings invite two interpretations. Either patients with undocumented and pre-existing autoimmunity comprise the majority of the critical illness within our cohort or, more likely, the immunological environment of serious COVID-19 infection is sufficient to drive de novo autoreactivity against a variety of clinically testable self-antigens with potential impact on disease pathology and direct implications in disease resolution.

9:39 – 9:45 am
#109 – Longitudinal analysis of adaptive immune responses following COVID-19 vaccination stratified by prior infection status
Anusha Panjwani, Edupuganti N, Espinoza D, Fridkin SK, Scherer EM, Collins MH

Implementation of COVID-19 vaccines is essential to ending the ongoing pandemic. While COVID-19 vaccines were developed in remarkable time, questions remain about the durability of immunity. We asked whether prior SARS-CoV-2 infection affects the magnitude and duration of antibody responses elicited by mRNA COVID-19 vaccines as measured by IgG binding the receptor-binding domain (RBD) of the SARS-CoV-2 spike protein, considering that these antibodies (Ab) have been correlated with neutralizing Ab, which are likely a marker of protective immunity. This analysis is accomplished via the AID-CoVax study (Adaptive Immune Determinants of protection in COVID-19 Va(x)cination), a longitudinal cohort study comprising individuals (n=60) with known SARS-CoV-2 infection status for the 6-9 months prior to receiving COVID-19 vaccination. An enzyme-linked immunosorbent assay (ELISA) was used to measure endpoint dilution titers of IgG to RBD in subjects' sera prior to vaccination and 60 days after the second dose. The mean IgG titer against RBD was not significantly different (p>0.05) in those with previous SARS-CoV-2 infection compared to those without prior infection at 60 days post-vaccination. Future studies will examine the kinetics of IgG titers through one year, and we expect the greatest difference between the groups 7-14 days after the first vaccine dose. We will also assess neutralizing Ab responses up to one-year post-vaccination. Finally, the frequency of SARS-CoV-2-specific memory B cells will be measured, as it has recently been shown that this population may predict how robust protection against future SARS-CoV-2 infection will be – including against variant viruses in circulation. These findings are critical because, with major deficiencies of vaccine rollout and vaccine availability worldwide, determining the need and timing of subsequent vaccine doses has major implications for vaccine implementation strategies intended to maximize population-level protective immunity globally.

9:51 – 9:57 am
#104 – Functional lumen imaging probe topography diagnoses esophagogastric junction outflow obstruction which responds to botulinum toxin injection

Background: The relevance of idiopathic esophagogastric junction outflow obstruction (EGJOO) is unclear. The functional lumen imaging probe (FLIP), identifies EGJOO in up to 70% of patients. We aimed to determine the prevalence and clinical features of FLIP-EGJOO and assess symptomatic improvement with lower esophageal
sphincter (LES) Botulinum toxin (Botox) injection. Methods: Adult patients diagnosed whom received Botulinum toxin (Botox) injection to the LES for a diagnosis of idiopathic EGJOO on FLIP [distensibility index (DI) of £ 2 mm2/mmHg] over a 20-month period were retrospectively studied. Reported % improvement in dysphagia and/or non-cardiac chest pain 2 weeks after was used to characterize treatment response. Validated symptom questionnaire scores [Gastroesophageal Reflux Disease Questionnaire (GERDQ), Brief Esophageal Dysphagia Questionnaire (BEDQ), Eckardt Score (ES)] and physiologic data were compared before and after Botox. Results: Of 213 patients undergoing FLIP, 94 (44.4%) had EGJOO. Forty patients (ages 38-94, 75% female) met full inclusion criteria. Symptomatic response to Botox at 2 weeks occurred in 77.5%. No physiologic or demographic variables were associated with treatment outcome. At a median follow-up of 82 days, BEDQ decreased from 13 to 3.5 (73.1% improvement, p<0.0001) and ES from 4 to 2.5 (p=0.0008). Only 32.5% had radiographic EGJOO. Barium tablet retention was associated with higher BEDQ (17 vs 11, p=0.034), higher ES (6 vs 3, p=0.034), and higher maximal pressure on FLIP (77 vs 63 mmHg, p=0.017). Conclusion: Idiopathic EGJOO is highly prevalent on FLIP if esophageal symptoms are present. Dysphagia and chest pain improve in approximately 80% of patients after Botox.

9:57 – 10:03 am
#4 – COVID heartbreak
Moneba Anees, Brown MT, Levit RD

Introduction: Takotsubo Syndrome (TTS) and Acute Coronary Syndrome (ACS) present similarly, but minor nuances distinguish the two apart. Patterned hypokinesia and non-obstructed vessels are hallmarks of TTS. Incidence of TTS has been shown to increase in times of crises and is important to consider when evaluating chest pain during the COVID pandemic. Case: A 62-year-old well-nourished female with hypertension and metastatic gastric cancer presented with fever, chest pressure, and dyspnea and tested positive for COVID-19. She remained hemodynamically stable and in no respiratory distress but was found to have a significant troponin rise up to 0.98. Serial electrocardiograms (EKGs) revealed diffuse, dynamic t-wave inversions and prolonged QTc. Urgent transthoracic echocardiogram (TTE) showed a newly reduced ejection fraction (EF) of 15% and apical hypokinesia with basal sparing, consistent with TTS and large coronary vessel obstruction. Subsequent left heart catheterization revealed no coronary disease, confirming the diagnosis of a non-ischemic cardiomyopathy, likely as a result of COVID-19 infection. Discussion: TTS and ACS can both present as shortness of breath and chest pain with elevated troponins and EKG changes. In delayed TTS presentations, T wave inversions and QT prolongation without ST segment elevation may be seen. Our patient improved with dexamethasone, remdesivir, and heart failure goal directed medical therapy. Literature review shows an increased incidence of TTS in the era of COVID-19, likely due to complications of the virus or the stressors associated with the pandemic. TTS cases have increased during prior natural disasters, and it is imperative to keep TTS in mind when evaluating patients for ACS in the midst of the pandemic.

Group VI: Molecular basis of disease

9:15 – 9:21 am
#11 – 3-dimensional multi-omic imaging of atherosclerosis
Kyung In Baek, Tamargo I, Williams D, Kang DW, Kumar S, Jo H

Background and aims: Atherosclerosis is a multifactorial inflammatory disease accounting for the leading cause of morbidity and mortality. While the pathobiology of atherosclerosis remains incompletely understood, a growing body of evidence supports disturbance in blood flow is a primary determinant of chronic inflammatory responses and preferential atherosclerotic lesion formation. Yet, a paucity of 3-dimensional (3D) multi-omic imaging frameworks remains to spatially understand hemodynamic cues underlying atherosclerosis. While histopathology of local lesion limits systemic assessment of disease progression, tomographic imaging techniques such as a hybrid micro-computed tomography/positron emission tomography provide low spatiotemporal resolution to visualize endothelial ultrastructure. In this context, we propose a novel imaging platform that combines Clear, Unobstructed Brain/Body Imaging Cocktails and Computational Analysis (CUBIC) clearing method with a modified hybridization chain reaction-immunofluorescence (HCR-IF) protocol for multi-omic analysis of atherosclerosis. Method and results: C57BL6 partial ligation model was used for whole-mount CUBIC clearing. Once the transparency of the left carotid artery (LCA) is achieved, the lipid-washed aortic tree was probed against GAPDH mRNA and subsequently against CD31 and CD68 to provide global geometry of
endothelial architecture undergoing inflammation. Following light-sheet imaging, we applied post-image processing and adaptive machine learning algorithms to automate the segmentation of the estimated area of the plaque. The ligated LCA displayed heterogeneity of plaque volume and significant loss of endothelial lining. We further observed an aggregation of GAPDH mRNA within the plaque on the necrotic core where it colocalizes with CD68 staining. Conclusion: Integration of the whole-mount CUBIC clearing and HCR-IF protocol may provide a new imaging insight into volumetric detection of novel mechano-responsive genes and their function underlying atherosclerosis.

9:21 – 9:27 am

#22 – Polycomb group protein CBX7 represses cardiomyocyte proliferation via modulation of the TARDBP/Rbm38 axis


Background: Cardiomyocyte (CM) proliferation notably decreases during the perinatal period. Regulatory mechanisms for this loss of proliferative capacity are poorly understood. CBX7, a polycomb group (PcG) protein, regulates the cell cycle but its role in CM proliferation is unknown. Methods: We profiled CBX7 expression in the mouse hearts via qRT-PCR, western blotting, and immunohistochemistry. We overexpressed CBX7 in CMs via adenoviral transduction. We knocked down CBX7 by using constitutive and inducible conditional knockout mice (Myh6-cre;Cbx7fl/+ and Myh6-MCM;Cbx7fl/fl, respectively). We measured CM proliferation by immunostaining of proliferation markers. We examined the mechanism via co-immunoprecipitation, mass spectrometry, and other molecular techniques. Results: The mRNA expression of Cbx7 was increased at the perinatal stage and sustained in the postnatal heart (fold increase of adult vs. prenatal: 32.1 ± 3.3, P < 0.01). Overexpression of CBX7 reduced CM proliferation (% of Ki67+ CMs: Ad-Mock, 22.3 ± 1.7 vs. Ad-CBX7, 7.7 ± 0.7, P < 0.001). The haplodeficiency of CBX7 (Tnnt2-Cre;Cbx7fl/) enhanced proliferation of neonatal CMs in vivo (% of Ki67+ CMs: wild-type, 7.9 ± 0.9% vs. mutants, 24.7 ± 1.2%, P < 0.01), leading to increased myocardial wall thickness, cardiomegaly and neonatal lethality. Genetic deletion of CBX7 in CMs (Myh6-MCM;Cbx7fl/fl) at P1 resulted in increased CM proliferation (% of Ki67+ CMs: vehicle, 9.5 ± 1.4% vs. tamoxifen, 18.3 ± 1.8%, P < 0.01), leading to cardiomegaly at 3 months. Mechanistically, CBX7 interacted with TAR DNA-binding protein 43 (TARDBP) and positively regulated its downstream target, RNA Binding Motif Protein 38 (RBM38). Rbm38 was perinatally upregulated in the mouse hearts and overexpression of RBM38 reduced CM proliferation. Conclusions: CBX7 expression is perinatally increased in the mouse hearts and inhibits proliferation of CMs by controlling TARDBP/Rbm38 pathway. This is the first study to demonstrate the role of CBX7 in regulation of CM proliferation and CBX7 could be an important target for cardiac regeneration.

9:27 – 9:33 am

#71 – Evaluating the role of TLR4 in the progression of atherosclerosis in a mouse model of Beta Thalassemia (Hbbth-3)

Julian Hurtado, Sellak H, Fernandez Tim, Lewis C, Archer D, Taylor WR

In Beta Thalassemia (BT), it is unknown if there is a direct relationship between BT and atherosclerotic disease. BT patients have increased free heme which can directly generate ROS via Fenton chemistry or downstream via TLR4 activation, but the role of heme to disease progression in BT is poorly characterized. Here, we will evaluate the effects of TLR4 in the progression of atherosclerosis in BT. Atherosclerosis was induced in BT(Hbbth-3) and wild type male/female mice (n=5) through Paigen high fat diet for 8 weeks, retroorbital injection of 1E11 GC of AAV8-PCSK9 on week 2 to knockdown the LDL receptor, and Angiotensin II delivery (0.75 mg/kg-day) via osmotic pump during weeks 4-8. A second complementary long-term model of atherosclerosis (PCSK9 + 3 months high fat diet) was evaluated (n=7). Atherosclerosis was evaluated by atherosclerotic plaque lesion area of the descending aorta via en face analysis and aortic root histology (H&E). We performed bone marrow transplants (BMT) by grafting WT and BT bone marrow (n=2-4) into both wild type and TLR4-/- mice, and we induced atherosclerosis as described in our long-term model. Aortic en face analysis revealed elevated plaque accumulation in BT mice (WT: 22 ± 4% plaque area vs. Thal: 45 ± 11% plaque area, p = .024). Aortic root (H&E) analysis did not display a significant difference in our short model, but it was significantly increased in our long-term model. In our BMT experiments, we saw a significant decrease in aortic root plaque in TLR4 -/- with Thal BM (.24 ± .06 mm2) compared to WT with Thal BM (.39 ± .07 mm2). Our data demonstrate for the first time that the underlying pathophysiology of BT clearly leads to accelerated atherosclerosis and
suggest that TLR4 is playing a role in atherosclerotic development in BT.

9:39 – 9:45 am

#139 – Harmonizing clinical metabolomics with index chemicals
Jaclyn Weinberg, Liu KH, Jones DP

Harmonizing metabolomics data acquired across multiple analytical platforms would enable construction of large-scale databases suitable for personalized medicine. For untargeted metabolomics based on liquid chromatography with high-resolution mass spectrometry (LC-MS), chemicals are identified by their characteristic accurate mass-to-charge ratios (m/z) and retention times. Mass is a fundamental property of all chemicals and a given chemical should have an identical mass across different analytical platforms. However, chemical retention times can vary between laboratories and separation strategies (e.g., column, eluent conditions, instrument plumbing) used for analysis. Harmonizing data collected across different platforms means that results from one method can be compared to results from another platform. Here, we hypothesized that use of index chemicals, or sets of “landmark” chemicals that are consistently detected across all platforms, can be used to identify chemicals across different analytical platforms. Our results show that landmark chemicals can be used as a chemical retention map which can be used to translate chemical retention times across different methods. This approach provides a strategy for harmonizing high-resolution metabolomics data acquired across different LC-MS platforms, with potential application for harmonizing publicly available metabolomics datasets.

9:45 – 9:51 am

#113 – The microbiome contributes to endochondral heterotopic ossification in Fibrodysplasia Ossificans Progressiva (FOP) mice by regulating innate immune cell recruitment and polarization
Jessica Pierce, Hohl MS, Roberts RL, Pal S, Pacifici R, Perrien DS

FOP is marked by a hyperinflammatory response to skeletal muscle injury leading to endochondral heterotopic ossification (EHO) of muscles and soft tissues. While FOP is caused by mutations in ACVR1/ALK2, inflammation and innate immune cells are key components of flares and EHO. Since commensal microbiota can regulate inflammatory tone and monocyte (MCY)/macrophage (MΦ) recruitment to injury sites, we hypothesized that gut microbiome ablation would reduce EHO in FOP mice via reduced inflammation. To test this, 3-wk old FOP mice were treated with an antibiotic cocktail (ABX) via drinking water or with sterile water (CON) from 10 days prior to hindlimb muscle injury (to induce EHO) until sacrifice. Remarkably, ABX reduced EHO by 49% at 21 days post-injury (dpi) (p=0.021 vs CON). At 2 dpi, flow cytometry revealed the muscle lesions of ABX mice contained significantly less CD45+ and CCR2+ immune cells, less CD16/32+ proinflammatory MΦs, but more CD206+ anti-inflammatory MΦs vs. CON mice (all p<0.05). To investigate whether the reduced EHO was mediated by the MCYs/MΦs, ABX FOP mice received i.v. injections of bone marrow MCYs from CON mice with intact microbiomes or media alone at injury and at 3 dpi. At 2 dpi, the muscle lesions of MCY-injected ABX mice contained 71% more CD45+ cells and 290% more CCR2+ MΦs than media-injected ABX mice (both p<0.05), demonstrating the injected cells rescued the ABX effects on inflammatory cells. More importantly, MCY injection restored EHO formation in ABX FOP mice compared to media-injected ABX FOP mice. Together, these findings demonstrate that the host microbiome contributes to EHO severity in FOP mice by regulating the inflammatory response, MCY recruitment, and MΦ polarization during the early inflammatory phase of FOP flares.

9:51 – 9:57 am

#21 – Abnormal maturation and maintenance of circulating plasma cells in active systemic lupus erythematosus patients

It is well known that circulating antibody secreting cells (ASCs) are expanded when systemic lupus erythematosus (SLE) patients experience active diseases. However, the subsets, morphology, origins and transcriptome profiles of ASCs in the peripheral blood of active SLE patients remain largely elusive. In this study, peripheral ASCs were divided into 4 subsets based on the surface expression of CD19 and CD138. Interestingly, CD19- subsets (CD19-CD138+ and CD19-CD138+) were found enriched in SLE patients, but barely existed in healthy controls post influenza vaccination. Morphological examination of ASC subsets showed increased ER in SLE ASCs relative to those from vaccinated healthy subjects. Phenotypic characterization showed that circulating...
ASCs in active SLE patients predominantly expressed HLA-DR and Ki-67, suggesting that they were mostly proliferating and may be newly generated. Furthermore, a large fraction of ASCs in active SLE patients expressed both CXCR3 and CXCR4, indicating their homing potential to inflamed tissues and bone marrow. Next generation sequencing showed that ASCs in active SLE expressed a high polyclonal repertoire, and all subsets have a rich clonal interconnection. Transcriptome profiles of blood ASC subsets from active SLE patients and vaccinated healthy subjects revealed that blood ASCs in active SLE diseases upregulated anti-apoptotic genes and downregulated pro-apoptotic genes. Together, our findings suggested that during active SLE diseases, waves of newly generated ASCs underwent abnormal maturation in the peripheral blood by modulating survival factors and acquiring homing potential to both inflamed tissues and bone marrow compartments, where they find survival niches for their terminal differentiation into long-lived plasma cells (LLPCs) and may account for the persistent production of autoantibodies that are resistant to B cell depletion therapies.

Group VII: Oxidative stress & inflammation

9:15 – 9:21 am
#18 – Characterization of PAD4 localization in Neutrophil Extracellular Trap (NET) formation
Maeghan Brockman, Cooney KA, Wang L, Levit, RD

Neutrophils play an essential role in immune function but can also play a role in sterile inflammation in myocardial ischemia-reperfusion (MI/R). Neutrophils form structures termed NETs, or neutrophil extracellular traps, where neutrophils expel chromatin coated with effector molecules into the extracellular space upon interaction with inflammatory stimuli. It has been shown that extracellular DNA stemming from NETs worsen MI/R injury and therefore may lead to impaired cardiac function. Peptidylarginine deiminase 4 (PAD4) has been shown to be essential for chromatin decondensation during NET formation. Despite PAD4 necessitating the formation of NETs, how NET formation is regulated is incompletely understood. Here we aim to characterize the cellular localization of PAD4 in NET formation. Neutrophils were stimulated with lipopolysaccharide (LPS) to induce NET formation and PAD4 localization to the nucleus was measured through immunofluorescent staining and cellular fractionation. Preliminary results indicate that after 1 hour of LPS stimulation, there is no significant difference between the Pearson’s correlation coefficient for PAD4 and DAPI colocalization for control cells (0.145 ± 0.147, n = 3) and LPS treated cells (0.096 ± 0.056, n=3). LPS treated cells resulted in greater PAD4 and DAPI colocalization (0.273 ± 0.166, n=1) compared to control cells (0.144 ± 0.311, n=1), as indicated by a greater Pearson’s correlation coefficient after 30 minutes of LPS treatment. Western blot analysis showed presence of PAD4 in the nuclear fraction in both control and LPS treated cells, but PAD4 was not detected in the cytoplasm. These experiments indicate that the timing of stimuli may be important for PAD4 localization to the nucleus. Further studies can provide a better understanding of PAD4 regulation in NET formation and may lead to potential therapeutic targets for MI/R injury.

9:21 – 9:27 am
#27 – Alcohol impairs alveolar macrophage mitochondrial bioenergetics and phagocytosis through changes in hyaluronic acid dynamics
Kathryn Crotty, Yeligar SM

Alcohol use disorders (AUD), due to patterns of excessive alcohol use, cause significant morbidity and mortality due to multi-organ dysfunction. Alveolar macrophages (AM) are the first line of defense against pathogens in the lower respiratory tract. However, alcohol-induced mitochondria redox imbalance impairs the ability of AM to phagocytose pathogens. Oxidative stress also alters the molecular dynamics of the extracellular matrix polysaccharide, hyaluronic acid (HA), which has been implicated in pulmonary immunity and inflammation. Since preliminary data show that high molecular weight HA (HMW HA, >1000kD) impairs mitochondrial bioenergetics, we hypothesize that HMW HA will further exacerbate alcohol-induced AM mitochondrial and phagocytic dysfunction. In vitro experiments were performed using the MH-S mouse AM cell line, treated ± 0.08% ethanol (EtOH) for 3 days or 25 nM of HA for 72 hours. Mitochondrial bioenergetics and fuel flexibility were measured using an extracellular flux bioanalyzer. Phagocytic index of MH-S cells was assessed by internalization and clearance of S. aureus fluorescent-labeled bacteria. MH-S cells treated with EtOH and HMW HA show alterations in mitochondrial bioenergetics profile (basal respiration, mitochondria-linked ATP respiration, proton leak, maximal respiration, and spare respiratory capacity) and mitochondrial fuel oxidation (metabolic substrate dependency, flexibility, and capacity of utilizing the glucose,
glutamine, and fatty acid pathways). Additionally, diminished phagocytic capacity due to EtOH is intensified by HMW HA. Overall, EtOH-induced alterations in HA in AM may dysregulate mitochondrial bioenergetics and fuel metabolism, thereby contributing to increased risk of respiratory infections in people with AUD.

9:27 – 9:33 am

**#57 – Low dose vanadium pentoxide increased cytotoxicity and oxidative stress in human lung fibroblasts**

Xiaojia He, Smith MR, Jarrell ZR, Orr M, Go Y, Jones DP

Research during the last half century has provided conflicting views concerning the biologic role of vanadium (V) in mammals, ranging from use as a dietary supplement to risk of environmental exposure. V is a toxic substance that is listed on the Agency for Toxic Substance and Disease Registry. High occupational V exposures cause oxidative stress and lung fibrosis, but whether similar mechanisms occur at lower exposures is unknown. To test our hypothesis that V at low levels stimulates lung fibrosis signaling by the mechanism involving increased oxidative stress and cytotoxicity, we used human fetal fibroblast (HFLF) cells exposed to vanadium pentoxide [V(+5)] at low dose (0, 1, 10, 20, 50 mM) for 24h. Cellular V concentration was measured by ICP-MS and showed dose-dependent increase in cellular content of V. The result of cytotoxicity measured by WST-1 showed that V(+5) caused moderate cytotoxicity with a LC50 of 41 μM. We then analyzed cellular redox state by measuring concentrations of the major cellular thiol and disulfide couple, GSH and GSSG, and their respective redox potential (EhGSSG/GSH) in response to V(+5) treatment. The result show that V(+5) at 25 and 50 mM substantially increased oxidative stress as a consequence of elevating EhGSSG/GSH to oxidation. Consistently, protein S-glutathionylation was significantly increased in HFLF cells exposed to V(+5) at concentrations ≥ 10µM. Furthermore, we observed V(+5) elevated expression of senescence associated b-galactosidase, a common marker associated with fibrosis signaling, suggesting V(+5) exposure may stimulate senescence. Taken together, the results suggest V(+5) could lead to significant cytotoxicity and cellular senescence by elevating oxidative stress, and ultimately contribute to the development of lung fibrosis.

9:33 – 9:39 am

**#5 – Efficient pneumococcal dissemination of Tn916-like integrative and conjugative elements in nasopharyngeal biofilms**

Brenda Antezana, Tzeng YL, Lohsen S, Wu X, Vidal JE, Stephens DS

Streptococcus pneumoniae (Spn) multi-drug resistance has been attributed to the exchange of integrative and conjugative elements (ICEs). Tn916-like ICEs, Tn2009 (23.5kb) and Tn2010 (26.3kb), carry mefE/mel or ermB, conferring macrolide resistance, and tetM, conferring tetracycline resistance. In other bacteria, prototype Tn916 (18.0kb) conjugates from donor to recipient by circular intermediate (CI) production and genome integration via site-specific recombination. However, the mechanism for Spn Tn916-like ICE transfer has yet to be elucidated. In a nasopharyngeal biofilm, Tn2009 or Tn2010 dissemination from donors GA16833 or GA47281 to recipient D39 was observed at recombination frequencies (rF) of 10-4. However, in vitro transformation with added CSP did not support Tn2009 nor Tn2010 uptake by planktonic D39 (rF<10-8-10-7). Correspondingly, non-CSP-supplemented competence gene expression of comD and comE in recipient D39 was 120-fold greater in nasopharyngeal biofilms compared to in vitro transformation conditions. Dual-strain biofilms do not support Tn2009 CI production (Cl:chromosome ratio 10-7-10-5) nor conjugative gene expression. Deletion of conjugative gene, ftsK, from Tn2009 does not affect ICE transfer from GA16833 to D39 in the nasopharyngeal biofilm (rF 10-4), while DNaseI addition (rF<10-7) and deletions of competence gene, comE, or transformation genes, comEA and comEC, in the D39 recipient lead to much lower rFs (<10-8-10-7). Recombinant whole genome sequencing reveals that Tn2009 and Tn2010 were incorporated on distinctly sized donor DNA fragments simultaneously with other distant donor genome fragments. Thus, Spn Tn916-like ICEs disseminate in dual-strain, nasopharyngeal biofilms via competence/transformation and integrate into a genome by homologous recombination.
9:45 – 9:51 am  
**#70 – Abnormal distribution of CD27+ IgD+ unswitched and CD27+ IgD- switched memory B cells in SLE Patients exposed to organic solvents**  

Background: some studies in animal models, support an association between occupational exposure to Organic Solvents (OS) and Systemic Lupus Erythematosus (SLE). The specific physiopathological changes that these chemicals could induce to accelerate an autoimmune response are not known. Dysregulation of B cells is central in SLE, but very little is known on how OS exposure could influence it. This study aimed to examine the distribution of B cell subsets on Healthy Controls and SLE patients occupationally exposed to OS.  

Methods: 40 SLE patients who met ACR criteria, and 17 Healthy Controls were recruited and classified as occupationally exposed or not to OS. Cryopreserved peripheral lymphocytes were analyzed by multiparametric Flow Cytometry using CD3, CD19, CD27, and IgD markers. Results: SLE patients exposed to OS had increased frequencies of CD27+ Switched Memory (SWM) cells. This change was associated with a specific OS like degreasers and ketones. Additionally, the few HC exposed to OS showed a decrease in Unswitched (USM) cells, with similar frequencies as those seen in SLE patients.  

Conclusions: Exposure to OS increased SWM cells on SLE patients and decreased USM cells on Healthy Controls. The influence of OS on SWM differentiation may be mediated through T cells. Previous reports of exposure to Trichloroethylene (a common OS), showed increased CD4+ T cell activation and secretion of INF-γ, this causes excessive T follicular helper development and germinal center formation in mice that could induce abnormalities in B cell subsets, and a similar mechanism may operate in OS exposed patients. Further research is needed to verify this hypothesis.

9:51 – 9:57 am  
**#99 – Glial cell derived neurotrophic factor prevents palmitate-induced oxidative stress and suppression of mitophagy in hepatocytes by increasing Sirt3 levels**  

Background: We have shown previously that glial cell derived neurotrophic factor (GDNF) enhances mitochondrial fatty acid β-oxidation in hepatocytes. In this study we investigated the ability of GDNF to enhance the expression of SIRT3, a key regulator of reactive oxygen species (ROS) levels, and mitophagy to protect against lipotoxicity.  

Methods: ROS levels were assessed by M-H2DCFDA staining, mitophagy by flow cytometry, gene expression by RT-PCR, and protein levels by Western blotting. Results: SIRT3 mRNA and protein levels were increased in primary human hepatocytes exposed for 24h to palmitate (PA) in the presence of GDNF, and in the liver of GDNF transgenic (GDNF Tg) fed a Western diet (WD) for 16 weeks but decreased in hepatocytes exposed to PA alone as well as in the liver of WD-fed WT mice. PTEN-induced putative kinase 1 (PINK1, a key regulator of mitophagy) levels were also highly increased in human hepatocytes exposed to PA in the presence of GDNF, and in the liver of WD-fed GDNF Tg mice. An 8h exposure of rat hepatocytes to PA increased cellular ROS levels while GDNF reversed this. In addition, PA exposure impaired mitophagic flux, while GDNF reversed it. In line with their lower oxidative stress, hepatocytes exposed to PA in the presence of GDNF had lower cleaved caspase-3 levels than cells exposed to PA alone. This protective effect of GDNF was, however, lost when SIRT3 levels were reduced using a SIRT3 siRNA.  

Conclusions: We demonstrate a novel role for GDNF in the regulation of hepatocyte ROS production and in enhancing mitophagy. These findings demonstrate that GDNF is protective against mitochondrial damage and suggest that GDNF agonists may be potential therapy for the prevention or treatment of NAFLD.
9:57 – 10:03 am
#118 – Targeted delivery of Hypoxia Inducible Factor-1 alpha (HIF-1α) inhibitor by lipidized nanoparticle for atherosclerosis
Kitae Ryu, Jo H

Hypoxia inducible factor 1-alpha (HIF-1α) is a central regulator of cellular responses to hypoxia and disturbed flow. HIF-1α is regulated by the physiological oxygen level, but disturbed flow could also regulate the HIF-1α activation in vascular endothelial cells, leading to atherosclerosis. Given its role in a wide-range of diseases including cardiovascular disease and cancer, numerous HIF-1α inhibitors such as PX-478, YC-1, and EZN-2968 have been developed. However, systemic use of these inhibitors has been complicated due to its various physiological roles of HIF-1α. Therefore, it is highly desirable to develop HIF-1α therapeutics that can be delivered in a targeted manner to diseased locations such as atherosclerotic plaques with minimum side effects. Here, I propose to develop lipid-modified PX-478 nanoparticles (NPs) that could be targeted to plaques to treat atherosclerosis. Conjugation reaction of PX-478 and lipid-like molecules having three different lipid-like molecules were carried out (lipidization). After lipidization of PX-478, the chemical structure, particle size and image, and HIF-1α inhibition effect were characterized. The lipidized PX-478 were synthesized (PC10, PC14, and PC18, depending on the length of carbon chains) and the chemical structure of the molecules were confirmed by nuclear magnetic resonance. The particle size of the PC10, PC14, and PC18 NPs showed 180.0 ± 1.3 nm, 169.8 ± 1.8 nm, 197.5 ± 1.3 nm, respectively. PC14 and PC18 NPs represented HIF-1α protein inhibition effect in vitro. In addition, HIF-1α and HIF-1α target genes including LOX, GLUT1, and GLUT3 were down regulated after PC14 and PC18 NPs treatment in vitro. These results revealed that the lipidized PX-478 NPs have a potential for targeted therapies for atherosclerosis.

10:03 – 10:09 am
#60 – Multiplex rRT-PCR for novel bunyavirus surveillance in Panamá
Sarah Hernández, Galué JF, Carrera JP, Waggoner JJ

Background. Bunyaviruses are a highly diverse family of RNA viruses, including numerous emerging pathogens, but these infections remain poorly characterized in many populations. In collaboration with Instituto Gorgas in Panamá, we developed a multiplex rRT-PCR to detect four novel bunyaviruses in Darién Province, a significant crossroads in the refugee crisis. Methods. Singleplex assays were designed based on provided whole genome sequences for Aruza and Aguas viruses, with a combined assay for Madrid/Matusagaratí viruses. 5-7 unique primer-probe sets were designed to the small genome segment using Primer 3 software. Singleplex assays were evaluated with genomic RNA from type strains, and the most sensitive singleplex tests were combined to develop a single-reaction multiplex assay. Results. Singleplex assays provided sensitive and specific detection of the different viruses, with Madrid and Matusagaratí viruses identified in the same reaction. No loss in sensitivity was observed when individual reactions were combined into a multiplex rRT-PCR. The multiplex assay demonstrated linear detection for each target from 8.0 to 2.0 log10 genome copies/µL with limits of detection from 2.5-16.1 copies/µL. Specific detection was maintained in the multiplex and no bunyavirus cases were detected among 40 suspected dengue cases from an epidemiologically distinct population. Conclusion. This study developed a multiplex molecular assay for the accurate detection of four novel bunyaviruses as part of an ongoing One Health study in Panamá. This assay will not be implemented to provide accurate bunyavirus detection and improve surveillance in the region.

9:15 – 9:21 am
#105 – Exploring poor water, sanitation, and hygiene (WASH) as factors related to leprosy transmission in Minas Gerais, Brazil
Tolulope Ojo-Akosile, de Oliveira LBP, Lima RK, Ferreira JA, Clennon JA, Branco AC, Magueta EB, Grossi MAF, Fraga LAO, Fairley JK

While leprosy is associated with poverty, it is not completely clear which factors, such as substandard and crowded housing conditions, unsafe drinking water, poor sanitation, or limited access to health care are driving this association. Given data suggesting that water and contaminated environments could be reservoirs for Mycobacterium leprae and that co-infections with water, sanitation, and hygiene (WASH)-associated helminths may increase susceptibility to leprosy, we aimed to explore the association of WASH factors with leprosy. A case-control study was conducted in the municipalities in and near Governador Valadares, Minas Gerais, Brazil, between June 2016-
December 2018. Individuals ages three years or older were recruited as cases or community-matched controls. Cases were diagnosed by dermatologic experts with confirmatory skin slit smears. Questionnaires were administered on socioeconomic status, education, and WASH factors. Descriptive and statistical analyses were conducted to identify associations with leprosy. Seventy-nine cases of leprosy and 81 controls (non-household contacts) were recruited of which 52.5% were male. 75.2% (n=112) of the participants had piped water as their water source, 54.5% (n=85) acknowledged they did not treat water. Multivariate logistic regression revealed an association with larger household sizes with leprosy (aOR = 1.34; 95% CI 1.07, 1.68), and an unexpected positive association with the presence of a piped sewer system (aOR=4.67; 95% CI 1.51, 14.45). In a contrast, those with leprosy were less likely to have household plumbing (versus a well or unimproved sources) (aOR=0.39; 95% CI 0.13, 1.18) or to treat their water (aOR=0.52; 95% CI 0.25, 1.06), although these did not reach statistical significance. These associations suggest that WASH factors could be related to leprosy and supports other emerging research in this field. Still, there is a need for further research on the association of WASH and leprosy disease, more specifically the potential mechanisms of bacterium exposure and viability of M. leprae in the environment.

9:21 – 9:27 am
#103 – Human bone marrow plasma cell survival is independent of APRIL
Doan Nguyen, Saney C, Sanz I, Lee FE

A fraction of the circulating antibody (Ab)-secreting cells (ASC) matures into long-lived plasma cells (LLPC) in the bone marrow (BM) microniches. Previous studies showed that ASC survival and longevity require APRIL, which upon binding its receptors, BCMA or TACI, activates PI3K/Akt (and its downstream mTOR) pathways and upregulates the expression of antiapoptotic proteins Mcl-1 and Bcl-2. Later work revealed that APRIL binding to SDC-1 (CD138), a cell-surface heparin sulfate proteoglycan (HSPG), also enables delivery of survival signals. Recently, we showed that APRIL is crucial in the ex vivo survival of early-minted human blood ASC. Here, using an in vitro cell-free BM microniche system, we demonstrate the differential roles of APRIL in the survival of human blood ASC and BM plasma cells (PC) and LLPC. APRIL substantially enhanced the survival of both CD138+ and CD138- ASC populations in the blood, which highly expressed BCMA. In contrast, it had no survival advantage on BM PC or LLPC, despite their high BCMA expression. Additionally, anti-CD138 Ab inhibited the survival of both blood ASC and BM PC and LLPC, including CD138- cell subsets, suggesting inhibiting the later CD138 upregulation also affects blood ASC survival. These data suggest that APRIL is important for the survival of early-minted blood ASC but not BM PC or LLPC. In conclusion, APRIL is an important survival and imprinting factor of blood ASC but is not required for LLPC maintenance.

9:27 – 9:33 am
#120 – An IL12-IFN driven regulatory axis attenuates transcriptional program during B cell development leading to generation of pathogenic autoreactive B cells in SLE
Saini Ankur, Meixue D, F. EHL, Christopher DS, Jeremy MB, Greg G, Iñaki S

SLE is a disease of B cell hyperactivity with generation of multiple autoantibodies. Physiologically, the danger of a pro-autoimmune B cell compartment is avoided by efficient enforcement of inactivation of autoreactive B cells of pathogenic potential. Our previous work has identified a subset of naïve B cells which are poised for activation and differentiation through TLR7-IFNg driven IL-21 mediated extra-follicular pathway into pathogenic autoreactive ASCs in active SLE. However, the regulatory program contributing towards the distinct priming of these naïve B cells in SLE remain poorly understood. Thus, we hypothesized that abnormal transcriptional program during early B cell development imprint the disease-associated molecular programs resulting in generation of pathogenic autoreactive naïve B cells in SLE. For this, Hematopoietic stem cells along with early B cell populations such as Pro-B, Pre-B, Immature and Transitional B cells were FACS purified from SLE and health control bone marrow (BM) along with naïve B cells from matched blood for single cell RNA-Seq. The data showed an upregulation of feedforward loop of IL-1- IL-12 causing high proliferation and transcription in early B cell developmental populations in SLE BM. More importantly, this loop upregulated type I and II interferon signaling pathways. This in turn enhanced the antigen processing and presentation, proliferation, activation, and survival pathways causing persistence of higher frequency of activated autoreactive B cells in SLE BM. Together, our data showed that an inter-regulatory interleukin-interferon network attenuating the transcriptional
program thereby supporting the survival of autoreactive B cells in SLE BM.

9:33 – 9:39 am  
**#150 – Basal TCR signaling drives the functional heterogeneity of naïve CD4+ T cells**  
Wendy Zinzow-Kramer, Weiss A, Au-Yeung B

T cells, a component of the adaptive immune response, protect the host from invading pathogens. In the thymus, T cells with weak reactivity to self-peptide presented by MHC Class II (self-pMHC) survive by positive selection. In the periphery, prior to activation with high affinity foreign pMHC, naïve CD4+ T cells experience weak “basal” T cell receptor (TCR) signals in response to self-pMHC. Here, we examine how diversity in the strength of basal TCR signaling influences responses of naïve CD4+ T cells. We used a combination of the Nur77-GFP reporter transgene and the surface protein Ly6C to visualize a broad range in the strength of basal TCR signaling. Cells experiencing the weakest basal TCR signals are GFP low Ly6C+, whereas cells experiencing the strongest basal TCR signals are GFP high Ly6C–. We find that there is functional heterogeneity in the naïve CD4+ T cell population, even if they express identical transgenic TCRs, such as the OT2 TCR. Cells experiencing higher basal TCR signaling mounted attenuated IL-2 responses, decreased sensitivity to TCR stimulation, and expressed proteins associated with anergy. This model is supported by RNA-seq analysis, which identified approximately 150 genes that were more highly expressed in cells experiencing strong basal TCR signaling, including anergy associated genes such as CD200, Helios, and Pdcd1. Furthermore, ATAC-seq analyses revealed over 3000 loci that were differentially accessible in cells experiencing strong basal TCR signals. We propose that naïve CD4+ cells exhibit phenotypic and functional heterogeneity, and that the source of their heterogeneity is due to the varying strengths of basal TCR signaling experienced by individual cells.

9:39 – 9:45 am  
**#107 – The intestinal microbiota restrains bone metastatic growth by promoting expansion of intestinal NK cells and Th1 cells and their homing to bone lesions in a melanoma mouse model**  

Osteolytic bone metastasis is a complication of malignant melanoma, an aggressive form of skin cancer. Antibiotics, which are often used in cancer patients, modify gut microbiome composition, leading to altered immune response. We hypothesized that antibiotic-induced gut microbiome depletion would alter intestinal immune cells leading to accelerated bone metastasis growth. Intracardiac or intratibial injections of B16-F10 melanoma cells were carried out in C57/BL6 mice to induce bone metastasis. In both models, antibiotic treated mice had more rapid bone metastatic growth compared to control mice. Flow cytometric analysis of Peyer’s patch and bone marrow (BM) cells within tumor lesions revealed that NK1.1 and Th1 cells were lower in antibiotic treated group, suggesting that the microbiome promotes intestinal NK1.1 and Th1 cells expansion and their migration to the BM. Direct measurement of NK1.1 and Th1 cells migration revealed that antibiotics decreased by ~8-fold the migration of NK1.1 and Th1 cells to the tumor site. The egress of NK cells and Th1 cells from the gut is mediated by S1PR5 and S1PR1 receptors, respectively. Demonstrating the functional relevance of immune cell trafficking, pharmacological blockade of either S1PR5 mediated egress of NK cells, or S1PR1 mediated egress of Th1 cells from the intestine mimicked the effects of antibiotics, preventing expansion of NK cells and Th1 cells in the BM, and causing accelerated bone metastasis growth. In summary, gut microbiome acts by promoting the expansion and activation of intestinal NK1.1 and Th1 cells and their migration to bone cancer lesions and restrain the growth of bone tumor.

9:45 – 9:51 am  
**#75 – Tet1 is required for stem cell regulation and secretory lineage specification**  
Nic Janto, Fonseca M, Hellen D, Gracz AD

Intestinal stem cells (ISCs) must balance roles in self-renewal, proliferation, and differentiation to replace short-lived differentiated cell lineages and maintain the intestinal epithelium. Understanding the regulatory mechanisms governing ISC differentiation has important implications for...
regenerative medicine, inflammatory disease, infection, tissue metaplasia, and cancer. One of the proposed regulatory mechanisms in ISCs is the DNA hydroxymethylation activity of the chromatin modifying enzyme ten-eleven translocation methylcytosine dioxygenase 1 (Tet1). Tet1 converts 5-methycytosine (5mC) to 5-hydroxymethylcytosine (5hmC) as the first step in demethylation, resulting in de-repression of previously methylated genomic elements. Tet1 expression is enriched in ISCs, and global 5hmC levels are generally higher in differentiated intestinal cells than in ISCs. We hypothesized that Tet1 would be necessary for ISC regulation. To test this hypothesis, we generated an inducible intestinal epithelial-specific Tet1 knockout mouse model (Tet1iKO). Tet1iKO mice produce significantly fewer tuft and enteroendocrine cells (EECs) and significantly more goblet cells and ISCs than the controls, suggesting Tet1 may be required for proper specification of tuft and EEC lineages. Tet1iKO mice also show reduced 5hmC levels at cell-type specific genes in progenitor and differentiated cells compared to controls, indicating that the requirement for Tet1 may be dependent on its catalytic role in hydroxymethylation rather than any non-catalytic functions. Together, our findings indicate that Tet1 is essential for regulating proper allocation of secretory lineages.

9:51 – 9:57 am
#8 – Bioactive silica nanoparticles stimulate autophagy, inhibit NF-kB signaling and osteoclastogenesis
Jing Z, Jamie Arnst, Cohen C, Ha S, Viggeswarapu M, Beck GR

Silica based nanoparticles have been demonstrated to be beneficial to bone, generating a positive effect on bone forming osteoblast lineage cells while simultaneously inhibiting the differentiation of bone resorbing osteoclasts. Studies in mice have demonstrated that intraperitoneal injection of silica nanoparticles has a beneficial effect on bone density suggesting the possibility that silica nanoparticles represent a dual action therapeutic however the mechanism(s) of action in osteoclasts remains to be fully defined. Understanding the mechanism will allow for enhanced design for increased therapeutic efficacy and specificity as well as potentially uncover novel insights into the basic biology of osteoclast differentiation. The goals of this study were therefore to investigate the cellular and molecular mechanisms by which silica nanoparticles inhibit osteoclastogenesis in a cell-based model. Spherical 50 nm silica nanoparticles strongly inhibited the early stages of the differentiation process and concomitantly inhibited early transcriptional regulators such as NfatC1 while stimulating expression of autophagy related genes p62 and Lc3b which required the ERK1/2 signaling pathway. The upstream biochemical pathways were also investigated, and the nanoparticles were found to stimulate autophagy while inhibiting both the canonical as well as non-canonical NF-κB signaling pathways. Collectively the results suggest a model in which silica nanoparticles compete for the autophagy apparatus which in turn inhibits the normally required function for osteoclast differentiation.

9:57 – 10:03 am
#64 – Activin A expression by PDFGRα-positive fibroadipocytic progenitors (FAPs) is necessary for endochondral heterotopic ossification in fibrodysplasia ossificans progressiva (FOP) mice
Michael Hohl, Elkins CE, Lyu H, Perrien DS

Fibrodysplasia ossificans progressiva (FOP) is a currently untreatable congenital disease characterized by episodes of endochondral heterotopic ossification (EHO) that lead to immobilization and disfigurement. In FOP, mutations in the Type 1 BMP receptor ACVR1/ALK2 cause aberrant BMP signaling in response to Activin A (ActA). This, in turn, triggers inappropriate chondrogenic differentiation of intramuscular fibro/adipogenitors (FAPs), leading to intramuscular EHO. ActA is expressed by FAPs and other cell types, but the necessary sources of ActA in FOP are not fully defined. This study tested the hypothesis that ActA expression by FAPs is necessary for injury-induced intramuscular EHO in FOP mice using FAP-conditional deletion of Inhba, which encodes ActA.

PdgfracreERt2/+;Acvr1R206H-FlEx/+;Inhba/-/ (ActAfAP/-/- FOP) and control PdgfracreERt2/+;Acvr1R206H-FlEx/+;Inhba+/+ (ActA+/+ FOP) mice received tamoxifen for 8 days to delete ActA in FAPs and/or induce expression of Alk2R206H, followed by a pinch injury of the lower hindlimb muscles to induce EHO. As expected, weekly in vivo radiographs revealed robust EHO in the hindlimb muscles of ActA+/+ FOP mice at 14- and 21-days post-injury (10.74±0.53 and 13.15±0.77, respectively). Strikingly, only insubstantial mineralization was seen in ActAFAP/-/- FOP mice on either day (respectively, 0.19±0.09; p<10–15 and 0.28±0.16; p<10-13 vs ActA+/+ FOP). Ex vivo μCT analysis confirmed that FAP-conditional deletion of ActA prevented EHO...
(ActA+/+ FOP=15.16±1.40 mm³ vs ActAFAP-/- FOP=0.28±0.18 mm³; p<10⁻⁶). These data demonstrate that autonomous expression of ActA by intramuscular FAPs is required for their chondrogenic differentiation and muscle-injury-induced EHO, and thus, identify FAPs as the necessary source of ActA in FOP mice.
11:30 – 12:30 pm Session II
(listed by order of presentations within groups)

Group IX: Covid-19 epidemiology & immunity

11:30 – 11:36 am
#3 – Examining antibody secreting cells resulting from the extra-follicular B cell responses through the lens of COVID-19
Fabliha Anam, Woodruff MC, Ramonell RP, Haddad N, Lee FE, Sanz I

In recently published work, our group described the expansion of the extra-follicular (EF) pathway for the first time in patients with severe COVID-19. Although well studied in mice, little is known about the B-cell selection process that accompanies activation of the EF pathway in humans – particularly how precursor affinity requirements differ from traditional germinal center activation. 55 B cell clonotypes were selected for monoclonal antibody production from a patient with severe COVID-19 and representative of EF response activation. As previously described, these clonotypes were class-switched but showed little evidence of ongoing somatic hypermutation. Resulting monoclonals were screened using a customized luminex-based assay to quantify specificity against a variety of SARS-CoV-2 antigens, with fine affinities assessed by surface plasmon resonance. Through monoclonal antibody screening, we identified more than 60% of clonotypes in the EF antibody secreting cell (ASC) compartment to have specificity to SARS-CoV-2, with nucleocapsid as the most common target. In addition, more than 10% showed specificity to the receptor binding domain, with some antibodies displaying affinities as high as 2.82 x 10-9 KD. ASCs derived from the EF response are largely antiviral specific, showing binding affinities on par with previous studies of germinal center responses and suggesting contribution to early neutralizing responses. However, the range of antibody affinities identified, and the lack of antiviral targeting by several clonotypes leaves open questions about the potential of this compartment for ‘misdirected’ antibody production.

11:36 - 11:42 a.m.
#50 – Estimating SARS-CoV-2 Seroprevalence from Spent Blood Samples, January–March 2021

Background: Measuring SARS-CoV-2 antibody prevalence in spent samples at serial time points can determine seropositivity in a diverse pool of individuals to inform understanding of trends as vaccinations are implemented. Methods: Blood samples collected for clinical testing and then discarded ("spent samples") were obtained from the clinical laboratory. A convenience sample of spent samples from inpatients and outpatients was collected one day per week from January-March 2021. Samples were matched to clinical data from the electronic medical record. In-house single dilution serological assays for SARS-CoV-2 receptor binding domain (RBD) and nucleocapsid (N) antibodies were developed and validated using pre-pandemic and PCR-confirmed COVID-19 patient samples. ELISA optical density cutoffs for seroconversion were chosen using receiver operating characteristic analysis. IgG profiles were defined as natural infection (RBD and N positive) or vaccinated (RBD positive, N negative). Results: A total of 2406 samples were collected from 2132 unique patients. Median age was 58 years (IQR 40-70). 210 (9.9%) patients ever had SARS-CoV-2 detected by PCR, and 191 (9.0%) received a COVID-19 vaccine within the health system. Nearly half (1186/2406, 49.3%) of samples were collected from inpatient units, 586 (24.4%) from outpatient labs, and the remainder from the emergency department or infusion centers. 17.0% had the IgG natural infection profile, while 16.2% had a vaccination profile. Prevalence estimates for IgG due to natural infection ranged from 24.0% in week 2 to 9.7% in week 5, and for IgG due to vaccine from 4.4% in week 2 to 32.0% in week 6. Conclusion: Estimated SARS-CoV-2 IgG seroprevalence among patients at a medical center from January-March 2021 was 17% by natural infection, and 16% by vaccination. Weekly trends likely reflect community spread and vaccine uptake.
11:42 – 11:48 a.m.

#66 – Occupational risk factors for SARS-CoV-2 infection among healthcare personnel: a 6-month longitudinal analysis of the COVID-19 Prevention in Emory Healthcare Personnel (COPE) study


Background and Aims: Healthcare personnel (HCP) may be at increased risk for SARS-CoV-2 infection. This study aimed to determine the incidence of SARS-CoV-2 infection among HCP and assess which occupational factors affect HCP risk for SARS-CoV-2 infection.

Methods: A longitudinal cohort study was conducted from May–December 2020. HCP working in four hospitals in a large academic healthcare system in Atlanta, GA completed monthly surveys regarding occupational activities. Serologic testing for SARS-CoV-2 IgG was performed at enrollment, 3 and 6 months. Multivariable logistic regression was used to identify occupational factors that increased the risk of SARS-CoV-2 infection. Results: Of the 304 HCP that were seronegative at enrollment, 26 (9%) seroconverted for SARS-CoV-2 IgG by 6 months. Participants self-identified predominantly as White (n=219, 73%), nurses (n=119, 40%), and working in inpatient medical/surgical floors (n=121, 40%). In a multivariable analysis, HCP who identified as Black were more likely to seroconvert than HCP who identified as White (odds ratio 4.5, 95% confidence interval 1.3–14.2). Increased risk for SARS-CoV-2 infection was not identified for any occupational activity, including spending >50% of a typical shift at a patient's bedside, working in COVID-19 units, or performing/being present for aerosol generating procedures (AGPs).

Conclusions: In our study cohort of HCP working in an academic healthcare system, <10% had evidence of SARS-CoV-2 infection over six months. No specific occupational activities were identified as increasing risk for SARS-CoV-2 infection.

11:48 – 11:54 a.m.

#56 – A mixed-methods study proposal for understanding racial disparities in COVID-19-related complications

Patel SA, Davis T, Patzer RE, Jagannathan R, Teunis L, Gander JC, Jessica Harding

Background: In the United States, the COVID-19 pandemic has magnified the disproportionate and long-standing health disparities experienced by Black communities. Unpacking the role of structural racism (through the multi-level processes that interact with one another to generate and reinforce disparities faced by racialized communities) on the risk of COVID-19 complications remains crucial to inform pandemic responses among Black communities. Here, we outline a mixed-methods approach to identifying and quantifying the specific modifiable factors that contribute to the dramatic disparity in COVID-19 complications in Black vs. White COVID-19 patients within Kaiser Permanente's (Georgia; KPGA) integrated healthcare system. Study Aims: 1. Quantitatively examine the individual, community, and structural factors contributing to disparities in COVID-19 complications (i.e., hospitalization) in more than 18,000 Black vs. White KPGA COVID-19 patients, using a variety of mixed-level data sources, including a novel COVID-19 survey and Emory Healthcare data, and decomposition analytic techniques. 2. Conduct semi-structured interviews among 10 Black and 10 White patients hospitalized with COVID-19 to understand factors that facilitate and impede health seeking behaviors.

Expected Outcomes: Results from this mixed-methods study will provide insights into the mechanisms underpinning racial disparities in COVID-19 to inform the development of multi-level strategies to reduce the burden of racial disparities in COVID-19 and its ongoing sequelae. Incorporating contextual information, elucidated from qualitative interviews, will increase the efficacy, adoption, and sustainability of such strategies.

11:54 a.m. – 12:00 p.m.

#145 – Mortality in an emergency-only hemodialysis population from COVID-19 in a large safety net

Yao Yao, Bhatia RD, Kasper L, Johnson SA

Background: The COVID-19 pandemic has shown to disproportionately impact certain populations highlighting health, economic and social disparities. An especially vulnerable group is the emergency-only hemodialysis (EoHD) patient population at Grady Health System, 91% of whom are Hispanic with a median age of 52. This population initially included 102 EoHD patients followed from 4/2020 to 5/2021. A COVID screening protocol was developed to assess disease prevalence, and patients who tested positive were isolated and treated accordingly. The aim of this study is to estimate the mortality rate in this at-risk population.
Methods: From 4/2020 to 5/2021, COVID PCR tests were administered either as scheduled screenings or diagnostically if a patient presented with symptoms; patients testing positive were isolated per health department and hospital policy recommendations. In total 494 PCR tests were performed, and 444 were screening; each patient received an average of 4.8 tests. Hospital admissions, complications, and mortality data were collected and analyzed using statistical software. Results: A total of 102 patients comprised the EoHD cohort at the onset of the study in 4/2020. Of this population, 58 (58%) patients tested positive for COVID and 19 (33%) of these COVID cases required hospitalization. The majority of positive cases (n = 32, 55%) were in asymptomatic patients and detected with screening tests while the remaining were diagnostic results. Eleven (11%) patient deaths occurred during the study, and two (2%) were attributed to COVID related complications. The remaining causes of death included hemorrhagic shock (1), cardiac arrest (1), heart failure (2), and unspecified, non-COVID related illnesses (5). The prevalence of COVID infection in patients who had diabetes and/or hypertension was non-significant (p-value = 0.2). Conclusion: Amongst the EoHD population, the risk of COVID-19 is disproportionately high compared to the general population possibly due to chronic exposure to healthcare settings and socioeconomic disadvantages. One would expect the mortality from COVID to be higher in this cohort as compared to the general population due to ESRD and associated comorbid conditions. However, our results show that COVID attributable deaths in the EoHD population was 2%, which is comparable to the 1.8% mortality rate observed in the general U.S. population.

From acute coronary syndromes to myocarditis to thromboembolism causing right ventricular dysfunction, COVID-19 can cause a wide array of cardiovascular complications. One must also consider stress-induced cardiomyopathy. A 62-year-old woman with a history of gastric cancer presented to the hospital with chest pressure and dyspnea on exertion, nausea with vomiting, and fever onset three days ago. Initial vitals were notable for an oxygen saturation of 93% and a heart rate of 115. Upon auscultation, there were decreased breath sounds on the left side. Cardiovascular exam showed tachycardia, but no murmurs or extra heart sounds. Chest x-ray showed left-sided pleural effusion. Computed topography of the chest was negative for pulmonary embolism. SARS-COV2 PCR test was positive. She was admitted and started on dexamethasone and Remdesivir, in addition to anticoagulation. Initial troponin was negative, then increased to 0.05. An electrocardiogram showed T-wave inversions in the anterolateral leads. Troponin continued increasing, peaking at 0.98. The patient was treated for non-ST elevation myocardial infarction. Echocardiogram showed left ventricular ejection fraction of 15%. Angiogram showed normal coronary arteries. A diagnosis of stress-induced cardiomyopathy was made. This case illustrates the importance of knowing COVID-19 is a systemic condition, with cardiovascular complications that convey increased mortality. With our patient’s case, acute coronary syndrome must be ruled out, as it can be life threatening. Luckily, patients with stress-induced cardiomyopathy see improvement in their left ventricular function. The question remains if increased psychological distress vs. direct injury via the virus causes stress-induced cardiomyopathy.

12:06 – 12:12 p.m.

#136 – Neurocognitive post-acute sequelae of SARS-CoV-2 in African Americans


Background: The impact of COVID-19 persists beyond the acute infection period, and 'long haulers' (i.e., persons more than 4 weeks post-acute infection) experience symptoms that negatively affect their activities of daily living and quality of life. Of these symptoms, the post-acute neurocognitive sequelae of the SARS-CoV-2 Infection (PASC) have not been systematically investigated, especially in groups identified as most vulnerable to poor outcomes from COVID-19 including African American adults. Towards this end, we examined the frequency and correlates of subjective complaints and objective neurocognitive symptoms of patients referred to the PASC Clinic established at Grady Memorial Hospital, an urban safety-net academic medical center in Atlanta Georgia. Methods: Forty one African American patients (mean age=54.0, range=22-74) were evaluated between January 14-April 22, 2021 in the Grady PASC clinic. They ranged from 1-10 months post positive SARS-_COV-2 antigen testing. Patients were administered a subjective cognitive complaint questionnaire (PROMIS Cognitive Function Scale) as well as cognitive screening.
measures including the Mini-Cog (3 item recall, clock) and the Digit Symbol Substitution Test (DSST; timed visuomotor sequencing). Mood was assessed via the Patient Health Questionnaire-9 (PHQ-9). Results: Twenty-seven (66%) of 41 patients reported experiencing clinically elevated symptoms of cognitive impairment on the PROMIS Cognitive Function Scale. Using a cutoff of > –1.5 SDs based on published norms, 19 (46%) of the 41 patients demonstrated age-adjusted impairment on one or both cognitive screening measures, with processing speed being impacted for more patients (83%) than memory/executive function (26%). Eight (53%) of 15 patients without subjective complaints had objective impairments. There were no significant (p>.05) differences in age or severity of initial COVID-19 symptoms (i.e., requiring vs. not requiring hospitalization) in either those with subjective complaints or objective cognitive findings. However, patients with subjective complaints were significantly less depressed (PHQ-9 m=6.7; SD=5.4) than patients without subjective complaints (PHQ-9 m=13.9; SD=6.3). Depression scores did not significantly differ between those with vs. without objective findings. Conclusions: Findings indicate a high frequency of subjective complaints and objective cognitive impairments in African American COVID-19 "long-haulers", and the data suggest that depression is not solely responsible for this elevated frequency. Cognitive screening should be routinely performed in African Americans in order to increase detection of neurocognitive PASC. Patients should be subsequently referred for detailed neuropsychological testing to fully characterize the specific domains that are impacted. Our ongoing prospective registry of African Americans and persons of other races/ethnicities will allow us to identify and to compare risk factors and mechanisms responsible for neurocognitive sequelae of PASC in a diverse sample.

12:12 – 12:18 p.m.

#142 – Relaxed peripheral tolerance drives broad de novo autoreactivity in severe COVID-19
Matthew Woodruff, Ramonell RP, Singh Saini A, Rudolph M, Lee FE, Sanz I

Background: Broad autoreactivity is an established feature in severe COVID-19 that may impact to disease pathology, however the origins of these responses remain unclear. Previously, we identified extrafollicular B cell activation as a shared immune feature between severe COVID-19 and active rheumatic disease. In autoimmune settings, this pathway is associated with relaxed peripheral tolerance and the generation of de novo autoreactive responses. Methods: To further investigate these responses in COVID-19, we performed single-cell B-cell repertoire analysis on 7 patients with severe disease to understand the nature of the antibody secreting cell compartment. We paired these data with cytometry-based and serological assays to detail the nature of these cells, and their contribution to antiviral, and autoreactive responses. Results: Through single-cell sequencing, we identify a unique low-mutation IgG1 fraction of the antibody secreting cell compartment. These cells are not memory derived, display very low levels of selective pressure, and are enriched for autoreactivity-prone V geneIGHV4-34. We identify B cell lineages that display specificity to both SARS-CoV-2 and autoantigens, and describe progressive, broad, clinically relevant autoreactivity within these patients including emerging reactivity against the glomerular basement membrane. Finally, we identify the contraction of this compartment post-recovery, re-establishment of tolerance, and concomitant loss of acute-derived responders irrespective of antigen specificity. Conclusions: In total, this study reveals the origins, breadth, and resolution of emerging autoreactivity in severe COVID-19, with significant implications in both acute-phase rheumatologic interventions and potential treatment of patients with post-COVID sequelae.

12:18 – 12:24 p.m.

#91 – Outbreak of SARS-COV-2 in hospitalized hemodialysis patients: An epidemiologic and genomic investigation

Background: Healthcare-associated transmission of SARS-CoV-2 is relatively rare and may be difficult to quantify. We performed an epidemiological investigation and SARS-CoV-2 genome sequencing to define the source and scope of a SARS-CoV-2 outbreak in a cluster of hospitalized patients. Methods: We conducted an outbreak investigation after identifying hospital-onset COVID-19 in patients receiving hemodialysis in January 2021. Electronic medical record review, staff interviews, review of employee schedule logs, and contact tracing were used to determine the outbreak timeline and identify exposed healthcare workers (HCW). SARS-CoV-2 genomes were sequenced from residual nasopharyngeal swab samples from 6 individuals in the outbreak.
investigation and compared to sequences from 14 patients in the same facility, 54 patients in nearby facilities, and 375 publicly available sequences from individuals in the state of Georgia. Results: Eight patients with hospital-onset COVID-19 were identified (Cases 1-8); all were receiving hemodialysis and 5 were bedded in a single inpatient nursing unit. Among 53 potentially exposed HCW, 29 underwent testing and 5 were positive (Cases 9-13). The suspected index patient (Case 1) was found to have been coughing and inconsistently wearing a mask during a hemodialysis session on the same day that 6 of the 7 other patients and one HCW (Case 10) were in close proximity in the hemodialysis unit (Figure 1A). Further investigation revealed lack of use of curtain barriers in the hemodialysis bays, inconsistent use of personal protective equipment by HCW, and overcrowding of staff breakrooms. Among the 6 samples available for phylogenetic analysis, SARS-CoV-2 sequences from 5 (4 patients and 1 HCW, Case 9) were identical and at least 4 SNPs removed from the next closest sequence in this study, supporting a transmission cluster (Figure 1B). The sequence from the sixth sample (HCW Case 10) was phylogenetically distinct, indicating an independent source of infection. Conclusion: Lack of appropriate respiratory hygiene led to SARS-CoV-2 transmission during a single hemodialysis session, based on clinical and genomic epidemiology. Use of appropriate PPE for both patients and HCW and other infection prevention measures are critical to prevent SARS-CoV-2 transmission.

Group X: Quality improvement - Disease prevention

11:36 – 11:42 a.m.
#94 – Successful Implementation of Universal HCV Screening at a Safety-Net Hospital’s Emergency Department During the COVID-19 Pandemic
Lesley Miller, Park BN, Taylor D1, Palacio A, Darby R, Shah B, Yaffee A

Background: In 2020, the USPSTF revised its hepatitis C (HCV) screening guideline to include universal screening. Grady Health System (GHS) has had an HCV screening program for baby boomers since 2012, with a high prevalence of chronic infection (5%). The program expanded to the Emergency Department (ED) in 2019. In 2020, we implemented new universal HCV screening in the GHS ED. We compare HCV prevalence and linkage to care between baby boomers (BB) and non-baby boomers (non-BB) during the first year of universal screening. Methods: We updated the electronic health record algorithm to flag all patients for screening aged 18-79 with no prior HCV test or diagnosis. ED triage nurses offered opt-out testing to flagged patients, which triggered an HCV antibody with reflex to HCV RNA order. We analyzed data from May 2020 to May 2021 for outcomes including HCV Ab and RNA prevalence and linkage to care. Results: 2,388 HCV Ab tests were performed in the ED, 78% among non-BB. The overall HCV Ab prevalence was 6%, with a
13% prevalence in BB and only a 4% prevalence among non-BB. 77% of all positive HCV Ab tests were followed by a reflex HCV RNA test, and 41% of BB and 62% of non-BB were RNA positive. The overall prevalence of chronic infection among all tested was 2.5%. Linkage to care occurred in 25% of ED patients and was double for BB (38%) versus non-BB (16%). Conclusion: Universal HCV testing in the GHS ED showed a high prevalence of HCV exposure and chronic infection. HCV Ab prevalence was higher among BB, while HCV RNA prevalence was higher among non-BB, likely reflecting more cleared or cured infection among BB patients. Overall, linkage to care rates were low, likely due in part to lack of in-person navigation and care access barriers associated with the COVID-19 pandemic.

11:42 – 11:48 a.m.
#110 – Using Active Surveillance to Identify Monoclonal Antibody Candidates Among COVID-19 Positive Veterans, Atlanta VA Healthcare System
Alexander Paras, Oliver NT, DeSilva KE, Epstein LH, Harris NM, Cartwright EJ, Moanna, A

Background and aims: Monoclonal antibody (Mab) infusions have reduced hospitalization and mortality among higher risk patients with mild to moderate COVID-19 symptoms. Using an interdisciplinary team approach, we created a clinical team to proactively screen and outreach patients with COVID-19 to equitably offer Mab. Methods: From December 28, 2020 - May 3, 2021, a clinical team consisting of an Infectious disease pharmacist and physician, reviewed each outpatient positive SARS-CoV-2 PCR test daily at the Atlanta VA Healthcare System (AVAHCS). Published Emergency Use Authorization criteria were utilized to determined eligibility. Eligible patients were prioritized using the Veterans Health Administration (VACO) Index for COVID-19 Mortality; and contacted via telephone to confirm eligibility and obtain verbal consent. Telehealth follow-up occurred at 1- and 7-days post infusion. Results: In total, 1,346 COVID-19 patients were identified; 86 (6%) patients were eligible, 48/86 (55%) received Mab infusions, and 31/48 (65%) were non-Caucasian. The median times for symptom-onset to positive COVID-19 PCR test result and positive COVID-19 PCR test result to Mab infusion were 6 days (0-9) and 2 days (0-8). SARS-CoV-2 IgG antibodies were detected in 4 of 24 (17%) patients tested. The most common comorbidities were hypertension (73%) and diabetes (42%). Five (10%) patients required hospitalization for worsening COVID-19 symptoms post infusion. No deaths occurred. Conclusions: This approach of combining laboratory surveillance and active screening minimized delay in symptoms onset to Mab infusion, thereby optimizing outpatient treatment of COVID-19 disease. Our approach successfully treated a more diverse patient population compared to clinical trials.

11:48 – 11:54 a.m.
#121 – Identifying Barriers to Vaccination in Veteran Patients with Advanced Liver Disease

Background and Aims: Patients with advanced fibrosis and cirrhosis are at high risk for vaccine-preventable conditions. Yet, many remain unvaccinated. The goal of our project was twofold: (1) identify barriers to vaccination, and (2) to formulate process improvement strategies to improve vaccination rates. Methods: An ad-hoc multidisciplinary quality improvement team was assembled to evaluate and improve upon vaccination efforts in VA GI and Liver clinics. Data was collected from providers through a 10-item questionnaire consisting of multiple choice, free response, and Likert scale questions. Results: 20 providers participated. 6 providers (30%) reported almost always addressing vaccination status with patients during an encounter in clinic. Data revealed that half of providers rarely or never perform post-vaccination serological testing. 13 (65%) providers had a note template for patients related to vaccinations, but 19 providers (95%) had interest in a standardized template. Providers believed that the most opportune time to address vaccinations was during patient intake with the clinic nurse (13, 65%) as opposed to during the encounter or check-in. Moreover, there was variability amongst providers in prioritizing the need for vaccination during patient encounters. Perceived barriers to vaccination included lack of time (65%), patients declining vaccinations (55%), and overlap of responsibility with PCPs (35%). Conclusions: Significant opportunities remain to improve vaccination rates among VAMC patients. Addressing opportunities and barriers such as provider education, standardizing a template for vaccination status and immunity in provider documentation, and engaging veterans during clinic intake could prove to be beneficial in improving vaccination rates.
#53 – Single Center Study on Vaccination Rates in Patients with Advanced Liver Disease in Liver & Gastroenterology Clinics
Thuy-Van Hang, Shah KP, Calderon LF, Shah AS.

BACKGROUND: Patients with advanced liver disease are immunocompromised and at increased risk of morbidity and mortality from vaccine-preventable diseases. This is a single center study aimed to assess the immunization rates in Digestive Diseases clinics and identify potential barriers to immunization. METHODS: Demographic and clinical data were collected on patients with advanced liver disease in the Gastroenterology, Liver, and Liver PharmD clinics at the Atlanta Veterans Affairs Medical Center. Vaccinations and immunity against influenza, tetanus, pneumococcal, hepatitis A virus (HAV), hepatitis B virus (HBV), and zoster were examined. Associations with being up to date or not with each vaccination were determined using chi squared test, Fisher’s exact test, and one way ANOVA, as appropriate. RESULTS: This study included 448 patients, with an average age of 67.17, and 96.88% were male. 52.90% were Black, 42.19% White, 1.56% Hispanic, 0.67% American Indian/Alaskan Native, and 2.46% unknown race. Overall, 62.9% were up to date with influenza, 73.7% tetanus, 57.1% pneumococcal, 83.5% hepatitis A, 60.9% hepatitis B, and 2.7% zoster. There was a difference in immunization rates for influenza, HBV, and zoster based on race (p=0.01, p=0.02, and p=0.02, respectively), as well as for influenza, HAV, and zoster based on clinic (p=0.00, p=0.03, and p=0.00, respectively). Child-Pugh Score/Class and Model for End-Stage Liver Disease Scores were associated with being up to date with HAV or not. CONCLUSIONS: Immunization rates in patients with advanced liver disease remains suboptimal. Interventions such as provider education, electronic medical record reminders, and patient-level interventions with paper reminders, are potential ways of addressing these missed opportunities.

#123 – Mission M.D.I (Malnutrition Diagnosing Initiative)
Yoo Mee Shin, Doster, J; Haeberlin, J; Lenner, B.

Background: Severe malnutrition is a frequently denied diagnosis. The Registered Dietitians (RD) and Clinical Documentation staff (CDS) started an initiative to improve the capture of malnutrition diagnoses in the medical record. Objective: The objective is to increase the capture rate of malnutrition diagnoses. Implementation: Four service lines were chosen to pilot: Emory Hospital Medicine Service, Kaiser Hospital Medicine Service, Otolaryngology and Surgical Oncology. The chiefs of service of each service line were informed of the project beginning November 1, 2020 and provided a short educational video. The process is below: 1. Patient who needs a nutrition consult is seen and assessed by RD. 2. If patient meets ASPEN criteria for mild, moderate or severe malnutrition AND the patient is currently on the service line included in the pilot, the RD will forward their note to the attending physician. 3. The attending physician will review the RD note and if they agree, they will cosign the document and add an addendum attestation statement (“I agree with the diagnosis of malnutrition”). 4. If the patient is not on the service line included in the pilot, our normal routine for CDI queries will take place. Data collection: We evaluated charts of only DRG payers. From the CDW (Clinical data Warehouse), encounters with a coded diagnosis of Severe Malnutrition (E43), Moderate Malnutrition (E44.0), Mild Malnutrition (E44.1), and Malnutrition, unspecified (E46) were manually analyzed. Conclusion: We noted an increase in compliance in physicians signing and adding attestation statements to the RD assessment notes and captured diagnoses of malnutrition. The number of CDI queries related to malnutrition has decreased.

#69 – Not Your Typical Obstructive Cardiomyopathy
Jingwen Huang MD, Brown MT, Williams BR III, Vega JD and Levit RD.

Introduction: Subaortic membrane is a congenital heart defect associated with other cardiac malformations in 50-65% of cases. Subaortic membrane may either cause rapid development of obstructive symptoms early in infancy or can remain asymptomatic for years. In this case, a symptomatic subaortic membrane mimicked hypertrophic cardiomyopathy (HCM) with left ventricular outflow tract (LVOT) obstruction. Case Description: A 57-year-old male with hypertension was newly diagnosed with HCM in the setting of new onset heart failure. He reported dyspnea but was hemodynamically stable and oxygenating well on room air. He had 3+ bilateral lower extremity edema, elevated jugular venous distention, and an apical holosystolic murmur on exam. Transesophageal echocardiography (TEE) demonstrated a subaortic membrane located in the basal interventricular septum, severe mitral
regurgitation (MR) due to thickening of the anterior mitral valve leaflet and moderate-severe aortic regurgitation (AR). Mean LVOT gradient was 14 mmHg with maximum of 32 mmHg. Despite aggressive diuresis, his dyspnea only mildly improved. He was referred for cardiothoracic surgery evaluation and subsequently underwent subaortic membrane resection with simultaneous bioprosthetic mitral and aortic valve replacements. Both mitral valve leaflets and the subvalvular apparatus were extremely thickened and both leaflets were tethered. Discussion: Subaortic membrane presentations are highly variable, from asymptomatic to recurrent syncope or heart failure symptoms due to fast, turbulent blood flow through the LVOT causing structural change. Echocardiography is the test of choice for diagnosis with TEE offering superior resolution to differentiate between alternative diagnoses like HCM with LVOT obstruction.

12:12 – 12:18 p.m.  
**#96 – Hospitalist Perspective of Communication with Subspecialty Consult Services**

Malik M, Watkins S, Amy Miller, Kim E, Hanna J, Geer BA, Leong T, Crichlow V.

Background: Communication with consultant teams is critical to hospitalists' workflow, especially in hospitals with multiple levels of hierarchy due to varying training backgrounds and experiences. We aimed to increase knowledge of the communication dynamic between hospitalists and consultant attendings in medical and surgical specialties. Methods: We surveyed Emory Division of Hospital Medicine physicians and Advanced Practice Providers to assess interactions with consultant attendings. Surveys were administered online using REDCap. Survey data was analyzed, and observational results are presented below. The survey was sent to 277 hospital medicine providers across all Emory Hospital Medicine sites and demographic information was collected. Results: A total of 87 completed surveys were analyzed. For medical subspecialties, cardiology, hematology/oncology, and neurology were services with the most pushback to hospitalist consults and 50% of providers felt that pushback negatively affected patient care. For surgical subspecialties, urology and neurosurgery were services with the most pushback. Male hospital medicine providers found it easy to determine how to contact the consulting attending 65% of the time and females 47% of the time (p=.004). Seventy percent of males and 40% of females reported they were "always" or "most of the time" comfortable with escalating a consult question to the attending (p<.001). Conclusions: We note that hospitalists experience pushback frequently and perceive that it negatively impacts patient care. Male and female hospital medicine providers have differing levels of comfort when it comes to discussing a consult with the attending provider. This is the first study to highlight communication barriers between hospitalists and their consultants.

12:18 – 12:24 p.m.  
**#134 – Improving naloxone prescriptions at discharge**

Meredith Trubitt

Aim Statement: To increase prescribing of nasal naloxone at discharge for patients at risk for opioid overdose. Background: Guidelines from HHS recommend co-prescribing naloxone for at-risk populations, and hospital discharge is an opportunity to reach this population. Baseline Conditions: Prior to this project, there had been no training for the hospitalists regarding naloxone prescribing, and there was no electronic system to prompt naloxone prescribing. Measures: Number of naloxone prescriptions / Number of opioid prescriptions whose OME warrants naloxone (based on guidelines provided). Actions/Tests of Change: All performed within the hospitalist group. PDSA 1: Introduced a “Controlled Substance Monitoring Note,” prompting providers to co-prescribe naloxone. PDSA 2: Provided written instructions on how to use “Controlled Substance Monitoring Note,” and guidelines on the populations who should receive naloxone. PDSA 3: In all hospital medicine workrooms posted aforementioned guidelines, and placed reminders on monitors to co-prescribe naloxone. Results: PDSA 1: After intervention, co-prescribing of naloxone was 0%. (0/9); PDSA 2: After intervention, co-prescribing of naloxone was 64%. (7/11); PDSA 3: After intervention, co-prescribing of naloxone was 33%. (1/4). Reflection/Follow-up: This project was started at the outset of the CoVID-19 pandemic, and our hospital medicine group was assigned to care for all CoVID-19 patients, resulting in decreased total prescriptions of opioids and naloxone. Thus, causing skewed data, as total prescriptions were low. Going forward, this project seeks to expand outreach to nurse case managers who assist in discharging patients to optimize a sustainable pathway forward.
Leptospirosis, a worldwide zoonotic infection caused by Leptospira spp. It has rodent primary and other mammalian secondary vectors and is transmitted by exposure to urine. It can present with multiorgan involvement, a condition known as Weil’s disease. A 61-year-old man with a history of gout and hyperlipidemia presented with fatigue and fevers and was found to have elevated CPK concerning for rhabdomyolysis. In the first 24 hours of his admission, he became progressively more tachycardic and short of breath, and was admitted to the intensive care unit on Day 2 of his hospitalization. During this same period, he had progressive elevation of his serum creatinine as well as elevation of transaminases and total bilirubin. Infectious disease was consulted; given the rapid progression of his symptoms as well as multiorgan involvement, a rapid diagnostic panel was sent which revealed Leptospirosis. The patient was treated with doxycycline and ceftriaxone. He had mild pulmonary hemorrhage and required brief intubation; however, his hepatic and renal failure did resolve, and he was discharged in stable condition. The patient had experienced a bicycle accident the week prior to admission with fracture of his right scapula and abrasions to his right arm. The abrasions sustained during the accident and exposure to standing road water were thought to be the route of infection. Discussion: This case illustrates a case of Weil’s disease associated with Leptospirosis infection, which can involve acute kidney failure, acute liver failure, rhabdomyolysis, and thrombocytopenia. Leptospirosis typically follows a biphasic course, with up to seven days of nonspecific symptoms (fever, myalgia) which may be followed by a mild anicteric phase (90% of cases) or, as in this case, an icteric phase which has 5-15% mortality without treatment. Diagnosis requires serological testing using polymerase chain reaction assay and/or detection of leptospiral antibodies. Mild cases are treated with oral doxycycline or amoxicillin, while severe cases are treated with parenteral high-dose penicillin G or ceftriaxone. Rapid decompensation in the hospital setting requires recognition of initial nonspecific biomarkers and knowledge of the pathological entity for early detection and treatment. Conclusion: Leptospirosis is an infrequent cause of multiorgan failure and can present a diagnostic challenge; practitioners must be familiar with the disease, consider it in their differential, and obtain appropriate testing in order to recognize infection.

Hypertension in pregnancy is common, but hypertension with associated hypokalemia is a rather unique entity in pregnancy and must be differentiated from more common causes such as preeclampsia as the pathophysiology is different. In 2000, Geller et al. reported a rare mutation in the mineralocorticoid receptor (MR) where progesterone, an MR antagonist, functionally activates the MR leading to hypokalemia and hypertension. Interestingly, this autosomal dominant trait only presents in the later stages of pregnancy when progesterone levels are highest. Since its discovery, the disease, termed Geller Syndrome, has been reported in very few cases. Herein we describe a case of recurrent pregnancy-induced hypertension and hypokalemia which resolved after infant delivery. A 33-year-old African American female with a past medical history of morbid obesity was evaluated for asymptomatic hypokalemia that was refractory to potassium supplementation. She was in the third trimester of her third pregnancy. It was noted on chart review that the patient had developed consistent hypokalemia while in the third trimester of her second pregnancy three years prior. She denied GI losses such as diarrhea or emesis and had not received insulin, albuterol, or diuretics. Blood pressure was elevated at 138/77. She appeared comfortable and euvolemic. Serum potassium was 2.4 mmol/L (3.5-5.1 mmol/L) with a random urine potassium of 47 mmol/L (high), serum magnesium 1.6 mmol/L (1.5 - 2.6 mmol/L), serum aldosterone level <1 ng/dl (low) and renin 0.25 ng/ml/h (low). Her hypokalemia did not resolve with aggressive potassium or magnesium supplementation until four days postpartum. This patient’s recurrent hypokalemia from non-aldosterone mediated renal potassium wasting during pregnancy (with normal potassium in a non-gestational state) is consistent with Geller Syndrome, however, a definitive diagnosis would require genetic analysis. While rare, it is important to recognize this disease’s presentation, as the MR antagonist spironolactone...
(which may inappropriately be chosen to decrease blood pressure and increase potassium) is strictly contraindicated due to unopposed progesterone activation and worsening of disease.

11:42 – 11:48 a.m.
#55 – Endometriosis Presenting as a Mass at the Hepatic Flexure
Amneet Hans, Sakaria S

Introduction: Endometriosis is a common gynecological disease defined as the presence of endometrial glands and stroma outside of the uterus. Bowel involvement can occur in 5-12% of women with the rectosigmoid colon involved in nearly 90% of cases. We report an extremely rare case of endometriosis presenting as a mass at the hepatic flexure. Case Description: A 49yo F presented to GI clinic for a second evaluation of a colon mass. Two months prior, she developed rectal bleeding and left lower quadrant abdominal pain and underwent a colonoscopy that a 2cm non-bleeding ulcerated mass at the hepatic flexure. This mass was biopsied, and pathology revealed chronic inflammation. A tattoo was placed adjacent to the mass. A CT scan did not reveal a colon mass, and repeat colonoscopy was recommended in three months. Due to persistent pain and bleeding, colonoscopy was repeated two months after the initial colonoscopy and revealed a 2.5cm ulcerated submucosal mass at the hepatic flexure. Biopsies again showed ulceration and granulation tissue. The patient was referred to surgery and underwent an extended right hemicolectomy. Surgical path showed 2.8cm of endometriosis involving colonic mucosa, submucosa, muscularis propria and pericolonic adipose tissue which was causing a mucosal polypoid lesion. At her most recent clinic visit, the patient denied any complaints. Discussion: To our knowledge, this is the second case of endometriosis presenting as a mass at the hepatic flexure. Colonic endometriosis is a rare diagnosis that may be difficult to make based on imaging and endoscopy with biopsies alone. Given the difficulty determining the diagnosis, postoperative histopathological examination may be necessary to establish a definitive diagnosis in these challenging cases.

11:48 – 11:54 a.m.
#116 – SARS-CoV-2 vaccine breakthrough infections in Atlanta, GA
Ludy Registre Carmola, Roebling A, Khosravi D, Wang E, Gulick D, Higginbotham D, Openo K, Segler S, Kraft C, Piantadosi A*, Babiker A* *equal contribution

We examined clinical and viral genomic data from vaccinated patients with SARS-CoV-2 infection to elucidate factors contributing to vaccine breakthrough. SARS-CoV-2 positive nasopharyngeal (NP) samples were collected from patients in the Emory Healthcare (EHC) system. Vaccinated patients were identified by the Georgia Emerging Infections Program (EIP) using Georgia Registry of Immunization Transactions and Services. SARS-CoV-2 genomes were sequenced and underwent lineage classification and phylogenetic analysis. Forty-eight vaccine breakthrough cases were identified between March 22 and July 16, 2021. The median time from final dose to positive test was 91 days (range 15-163). In a subset of 24 cases compared to 60 controls, there was no difference in median SARS-CoV-2 PCR cycle threshold (Ct) between cases (20.4, IQR 10.3) and controls (24.0, IQR 7.0; p=0.37). Twenty-four samples from vaccine breakthrough cases underwent SARS-CoV-2 genome sequencing and were compared to 116 surveillance sequences collected during the same time. Phylogenetic analysis did not show distinct clustering of sequences from breakthrough cases, which generally belonged to the predominant lineage circulating at the time. From March 22-June 19, B.1.1.7 (alpha) accounted for 78% of breakthrough cases and 78% of surveillance samples. From June 20-July 16, B.1.617.2 (delta) accounted for 86% of breakthrough cases and 72% of surveillance samples. No mutations in spike, including deletions, were over-represented among vaccine breakthrough cases compared to surveillance sequences. Overall, we did not observe differences in molecular or genetic characteristics of SARS-CoV-2 from vaccine breakthrough cases. Immunological studies may garner more insight into the mechanism of vaccine breakthrough infections.
11:54 a.m. – 12:00 p.m.

#88 – Late Presentation of a Large Secundum Atrial Septal Defect
Steven Lewis, Brown MT, McGorisk GM, Clements SD Jr.

Introduction: Atrial septal defects (ASDs) are one of the most common congenital heart defects with an estimated incidence of 1 per 1,859 births. The clinical course is variable and depends upon the size of the ASD. Patients with small ASDs may be asymptomatic. However, large ASDs (>10mm) can have significant hemodynamic effects and typically present by age 40. Case Presentation: A 75-year-old female with hypertension, hyperlipidemia, persistent atrial fibrillation on anticoagulation, and recent embolic cerebrovascular accident secondary to left atrial appendage (LAA) thrombus due to a newly discovered large secundum ASD was transferred for further management. She was hemodynamically stable without signs of JVD or peripheral edema. Cardiac exam was notable for irregularly irregular rhythm, fixed split S2, and III/V holosystolic murmur. Transesophageal echocardiogram confirmed a large ostium secundum ASD measuring 3.2 x 2.1 cm and a persistent LAA thrombus. Remarkably, she continued to have left to right shunting with only a modestly elevated RV systolic pressure of 47 mmHg and estimated pulmonary artery pressure of 18 mmHg. After much coordination, she underwent ASD closure with a 34 mm Amplatzer Occluder with plans for a Watchman LAA occlusion device later.

Discussion: Although ASDs are a common heart defect that often go undetected, patients with large ASDs typically present with symptoms early in life. This elderly female with a major ASD is an exceptional case, as she did not present with signs or symptoms until age 65 when she was diagnosed with atrial fibrillation. Her echocardiograms confirm continued left-to-right shunting with concomitant RV dysfunction but no Eisenmenger’s Syndrome, enabling her to undergo successful ASD closure without complication.

12:00 – 12:06 p.m.

#93 – Unintended Consequence of Cancer Therapy: A Case of Immune Checkpoint-Inhibitor Colitis
Ambreen Merchant, Shah KP, Obineme CG, Allamneni C, Sakaria SS

Introduction: The emergence of immune checkpoint inhibitors (ICIs) has transformed cancer therapy. However, immunotherapies can inadvertently lead to toxicity of multiple organ systems, including the gastrointestinal tract. Case Description: A 51-year-old woman with rheumatoid arthritis presented with dysarthria following several recent multifocal ischemic CVAs. Vital signs were significant for fever. Physical examination revealed left nasolabial fold flattening, left-sided weakness, and sustained clonus of the left upper and lower extremities. Initial laboratory work-up showed leukocytosis. CT of the head demonstrated a large intraparenchymal hemorrhage (IPH) within the right medial frontal lobe. Three sets of blood cultures were sterile, and routine infectious work-up was otherwise negative. Abdominopelvic imaging was performed to investigate new abdominal distention and revealed splenic and bilateral renal infarcts as well as a large left adnexal mass highly concerning for metastatic disease. Colonoscopy revealed congested erythematous mucosa with multiple erosions from the rectum to the descending colon in addition to contiguous areas of firm, raised, purple hemorrhagic nodules with surrounding inflammation. Endoscopic appearance raised concerns for ischemic colitis (especially with involvement of watershed areas) versus ICI-induced colitis. However, magnetic resonance angiography showed patent vessels. Pathology was inconclusive, but suggestive of an injury pattern consistent with ICI-induced colitis. Durvalumab was discontinued and the patient had multiple readmissions for grade 4 colitis, ultimately requiring steroids, infliximab, and vedolizumab.

Discussion: In patients receiving immunotherapy and presenting with diarrhea, clinicians must maintain a high index of suspicion for ICI-induced colitis, especially when infectious etiologies have been ruled out. While onset of symptoms is typically within months of starting therapy, our patient presented after completing one year of Durvalumab. The mainstay of treatment for ICI-induced colitis remains corticosteroids. However, as in our case, steroid-refractory patients may require second- and third-line treatment respectively with infliximab and vedolizumab. In grade 4 colitis, immunotherapy is permanently discontinued.

12:06 – 12:12 p.m.

#144 – Clonus, Cancer, and CVAs: A Case of Blood Culture-Negative Endocarditis
Adithya Yadalam, Damhorst GL

A 51-year-old woman with rheumatoid arthritis presented with dysarthria following several recent multifocal ischemic CVAs. Vital signs were significant for fever. Physical examination revealed left nasolabial fold flattening, left-sided weakness, and sustained clonus of the left upper and lower extremities. Initial laboratory work-up showed leukocytosis. CT of the head demonstrated a large intraparenchymal hemorrhage (IPH) within the right medial frontal lobe. Three sets of blood cultures were sterile, and routine infectious work-up was otherwise negative. Abdominopelvic imaging was performed to investigate new abdominal distention and revealed splenic and bilateral renal infarcts as well as a large left adnexal mass highly concerning for metastatic disease.
for malignant ovarian neoplasm. TEE was performed out of concern for endocarditis and revealed two large mitral valve vegetations and perforation of the anterior mitral valve leaflet. Mitral valve replacement was performed after stabilization of IPH. No bacterial DNA was detected on an operative specimen of the patient’s mitral valve vegetations, and thus following completion of an extensive infectious work-up, the diagnosis of nonbacterial thrombotic endocarditis (NBTE) was made. Systemic anticoagulation was considered but deferred due to recent IPH. Out of an abundance of caution, the patient was instructed to complete a four-week course of empiric antimicrobial therapy. This case demonstrates the challenges of approaching blood culture-negative endocarditis. Whereas blood culture-negative infective endocarditis (BCNIE) and NBTE both represent causes of blood culture-negative endocarditis, the management of these two clinical entities varies significantly, and thus timely differentiation between BCNIE and NBTE is of vital importance.

12:12 – 12:18 p.m.  
**#149 – Uncovering an atypical case of diabetes insipidus in diffuse large B-cell lymphoma**  
*Tony Zhuang, Ho J, Lalonde C, Haser G, Hassan Z, Veeraraghavan S*

A 47-year-old man with stage 4 diffuse large B-cell lymphoma (DLBCL) s/p R-CHOP presented with subacute weakness and encephalopathy. Head CT was revealing for new leptomeningeal disease and obstructive hydrocephalus without signs of infectious or autoimmune involvement. CSF cytology demonstrated monotypic atypical B cell involvement, confirming relapsed lymphoma with cerebral metastasis. On hospital day 38, urine output increased to >3L/day and labs were notable for Na 147, SOsm 265, UNa <20, and UOsm 170, consistent with central diabetes insipidus (DI) and raising concern for pituitary involvement of his malignancy. However, brain MRI demonstrated stable disease with intact pituitary anatomy. He was treated with dextrose-infused fluids and one dose of intravenous desmopressin, which normalized his hypernatremia and urine output. Unfortunately, he had no neurological improvement and the patient’s family decided to pursue comfort care. DI is characterized by a paradoxical imbalance of serum hypertonic hypernatremia with polyuric, hypotonic urine and decreased urine sodium. This physiology can be caused by vasopressin deficiency due to disrupted hypothalamic-pituitary axis (central DI) or resistance (nephrogenic DI). Acquired central DI is most commonly caused by altered anatomy due to trauma, surgery, or malignant or inflammatory infiltration of the hypothalamus or pituitary gland and is characterized by empty, compressive, or thickened infundibular sella on imaging. To our knowledge, there have been no reports of this condition with a normal pituitary axis anatomy as was seen in this case. DLBCL with cerebral metastases can rarely cause DI via pituitary infiltration even in the absence of radiographic abnormalities.

12:18 – 12:24 p.m.  
**#111 – Could your Vitamin B(12) any Lower?**  
*Mary Pelling, Kimura ST, Spencer ML, Han EJ, Shin YM*

Introduction: Anemia related to B12 deficiency is most frequently due to pernicious anemia and less commonly as a result of dietary deficiency. A deficiency leading to clinical consequences typically takes years to develop. Patients can develop pancytopenia and have neurologic consequences including paresthesias, ataxia and mental status changes. Case Description: A 39-year-old male with no past medical history presented with four days of paresthesias radiating from his fingertips through his elbows bilaterally, and months of shortness of breath, and fatigue. He reported feeling unbalanced and faint. Additionally, for seven months he experienced increased confusion including word finding difficulties. Further history taking revealed a strict vegan diet for 20 years with no additional vitamin supplementation. Vital signs were notable for a blood pressure of 85/48 mmHg, heart rate of 60 bpm with normal oxygen saturation. Physical exam showed sublingual pallor and slow conversational speech. Laboratory results revealed pancytopenia with a white blood cell count 1.7k/mcL, hemoglobin 4.5 gm/dL, mean corpuscular volume 103 fL, and platelets 111k/mcL. Additionally, indirect bilirubin was elevated at 1.74 mg/dL with a low reticulocyte index 0.1, elevated lactate dehydrogenase >3600 unit/L, and low haptoglobin < 3 mg/dL. Vitamin B12 level was undetectable at <50 pg/mL and folic acid level was normal. Thorough infectious and autoimmune workups were unremarkable. Intrinsic factor and parietal antibodies were negative. Imaging studies were unrevealing. Outcomes: Our patient’s symptoms of mental fog, ataxia and paresthesia improved rapidly with B12 supplementation. This case highlights the importance of vitamin B12 supplementation for patients following a strict vegan diet.
11:30 – 11:36 a.m.
#30 – Mental health services utilization among young Black gay, bisexual, and other men who have sex with men living with HIV

Background: Mental health (MH) comorbidities are prevalent among young Black gay, bisexual, and other men who have sex with men (YB-GBMSM) living with HIV. However, it remains unclear what factors are associated with utilization of MH services among YB-GBMSM engaged in HIV care.

Methods: We conducted a cross-sectional survey of YB-GBMSM from two HIV clinics. Utilization of MH services was defined as at least one self-reported MH visit in their lifetime. Psychological symptoms were assessed using the Generalized Anxiety Disorder assessment-7, Center for Epidemiologic Studies Depression scale, Primary Care Post-Traumatic Stress Disorder Screen, and self-reported substance use in the last six months. Multivariate logistic regression models were used to evaluate covariates of lifetime MH care utilization.

Results: Among 100 YB-GBMSM, over half (51%) reported utilizing MH services, and 40% had been referred to a MH provider in the past year. In multivariate logistic regression analyses, non- organizational religious activity (OR: 1.33, CI: 1.01-1.77), severe anxiety (OR: 5.23, CI: 1.08-25.26), and homelessness in the past three months (OR: 4.03, CI: 1.08-15.07) were associated with MH care utilization. HIV stigma, discrimination in medical settings, and other psychological symptoms (depression, trauma, substance misuse) were not associated with utilization of MH services.

Conclusions: Our findings that MH utilization was associated with homelessness, NORA, and severe anxiety suggest that service providers should consider promoting MH services to a wider range of YB-GBMSM clients, specifically to clients that do not present with psychological symptom complexes. Additionally, future research should explore the complex relationships between religiosity and MH.

11:36 – 11:42 a.m.
#48 – Examining Intersectional and HIV-related Stigma Among Youth Living with HIV in Atlanta, Georgia
Madeleine Goldstein, Moore S, Mohamed M, Byrd R, Zanoni BC, Camacho-Gonzalez A, Hussen SA

Background: HIV-related stigma has been identified as a barrier to engagement in care for youth living with HIV (YLH) and is associated with depression, anxiety, and poorer quality of life. We sought to examine experiences of stigma among YLH, as well as its possible influences on healthcare engagement. Methods: We conducted 20 qualitative interviews with YLH at a comprehensive HIV clinic in Atlanta, Georgia. Interviews examined how YLH experienced intersectional stigma, as well as enacted, anticipated, and internalized HIV stigma in healthcare and community settings.

Results: The mean age of participants was 28.5 years (SD 0.4). Most identified as African American (95%), male (80%), gay (75%), and acquired HIV horizontally (85%). Participants described stigma at intrapersonal, interpersonal, clinic, and community levels. Intrapersonal stigma was associated with delayed care seeking, isolation, and fear of disclosure. Stigma at the interpersonal level included discrimination from family and friends and avoidance of close relationships. At the clinic level, stigma included negative experiences with peers and staff, which contributed to decreased engagement in care. Stigma in the community included differential treatment within non-HIV healthcare settings and was associated with feelings of helplessness related to societal inequalities. Coping mechanisms for stigma included eliciting support from pediatric providers and peers.

Discussion: Our findings show intersecting stigmas contribute healthcare barriers at multiple levels for YLH, which has the potential to exacerbate existing health and social disparities. In order to improve engagement in care among YLH, future interventions should address the different mechanisms of stigma at community, clinic, and individual levels.
11:42 – 11:48 a.m.

#49 – The impact of churn on HIV clinical and care continuum outcomes in a Southern United States Cohort

Srinivasa Nithin Gopalsamy, Marconi VC, Armstrong WS, Colasanti JA

With effective HIV treatment available, retention in care and adherence to therapy are essential to increasing rates of viral suppression (VS), which improves clinical outcomes and reduces transmission. Persons with HIV (PWH) may experience a cycle of engaging and disengaging in care called “churn.” HIV churn has not been extensively studied in the South, where it is predicted to be more prevalent, and there are limited data on associated clinical outcomes. We conducted a retrospective cohort study involving patients newly establishing care at a HIV clinic in Atlanta, Georgia from 2012 to 2017. The primary exposure was experiencing churn, defined as having a ≥12-month gap between visits or viral load (VL) measurements. The outcomes evaluated from first visit onwards until 2019 included time to VS, proportion of VL measurements that are suppressed (<200 copies) or transmissible (≥1500 copies), and cumulative burden of AIDS-defining illness (ADI) per person. Of the 1305 PWH newly establishing care, 201 (15%) experienced churn. Adjusted for demographics and socioeconomic factors, the hazard ratio of VS was lower in the churn group (HR 0.66, 95% CI 0.55 – 0.79). The group also had increased odds of transmissible viremia (OR 1.85, 95% CI 1.69 – 2.03). The suppressed VL rate decreased from 42.7% on last measurement before disengagement to 17.7% on first measurement upon return to care. Churn was associated with greater ADI burden when the gap between encounters was at least two years (adjusted OR 2.68, 95% CI 1.44 – 5.01). In the first study focused on churn in the South, we found that churn was associated with poorer VL metrics and clinical outcomes. The increased rate of ADI and transmissible level of viremia underscores the impact of churn on individual and public health.

11:48 – 11:54 a.m.

#129 – A Novel Method to Detect CF Related Diabetes Using Changes in Voice Characteristics

Pichatorn Suppakijtanusant, Kasemkosin N, Ongphiphandanakul B, Weinstein S, Hunt WR, Sueblinvong V, Tangpricha V

Background: Cystic fibrosis related diabetes (CFRD) is among the most common extrapulmonary co-morbidities associated with cystic fibrosis (CF). The main complications of CFRD are worsened lung disease, poorer nutritional status, and increased mortality [1]. CFRD is usually clinically silent and patients may remain asymptomatic for years [2]. It is important to identify patients before the onset of CFRD to prevent complications. The standard test recommended by the CF Foundation for screening of CFRD is the oral glucose tolerance test (OGTT)[3]. This test requires multiple blood draws, a prolonged clinic visit, can be cumbersome to schedule, and for these reasons, may lead to a delayed diagnosis. We are interested in developing a novel technique to detect changes in glucose in humans by analyzing characteristics of the voice. High blood glucose levels cause laryngeal soft tissue swelling and lead to changes in voice characteristics [4]. Studies in patients with diabetes without CF have demonstrated a potential use of this technology [5]. The purpose of this study is to examine if changes in voice in patients without CFRD from patients without CFRD. Methods: A prospective cross-sectional study was performed in adults with CF recruited from the CF Clinic at Emory Healthcare from March to June 2021. We recorded 3-second voice samples of a sustained /a/ vowel. Voice parameters including fundamental frequency, jitter, shimmer, smoothed amplitude perturbation quotient, noise-to-harmonic ratio and relative average perturbation were analyzed using Computerized Speech Lab with the Multi-Dimensional Voice Program. Results: There were 22 patients with CFRD and 28 patients without CFRD included in this study (32 male and 18 female subjects). Patients with CFRD had a similar mean age to patients without CFRD (35 ± 13 vs 32 ± 13 years old, p=0.509). The mean HbA1c level in CFRD patients is 7.5 ± 2.4 %. An acoustic parameter analysis categorized by sex [Table1] shows fundamental frequency variation (vF0) in female individuals who have CFRD was significantly lower compared with those with CF alone (1.23 ± 0.52 % VS 1.80 ± 0.64 %, P < 0.05). Multivariate analysis showed that vF0 was not significantly associated with CFRD after controlling for age, body mass index, and presence of chronic sinusitis (P = 0.21). Conclusion: We present a novel screening tool for diabetes that may have potential use in the CF community. vF0 was lower in females with CFRD. Fundamental frequency is a function of mass, tension and length of acoustic apparatus. As a result of diabetic myopathy and neuropathy, the patients with diabetes have reduced muscular strength [5]. This can result in a decrease in fundamental frequency and its
variation. There is potential to use these technologies as a noninvasive test for earlier detection of undiagnosed CFRD.

11:54 a.m. – 12:00 p.m.
**#140 – Alcohol Exposure Impairs Multiple Avenues of Innate Immune Response to Mycobacterium Tuberculosis**  
Gregory Wigger, Sayegh L, Auld SC, Fan X, Guidot DM, Staitieh BS

Background and Aims: Alcohol use disorders (AUD) significantly impair lung immunity and increase the risks of bacterial pneumonia and tuberculosis (TB). The mechanism by which alcohol ingestion increases TB risk is unknown. We designed a series of experiments to determine how alcohol may predispose the lung to TB through its effects on the alveolar macrophage (AM).

Methods: Primary AM from control and alcohol-fed rats, along with a rat AM cell line (NR8383) were used. Expression of innate immune genes were assessed in NR8383 cells exposed ± 72h 60 mM alcohol and ± 24h Mycobacterium tuberculosis (Mtb). Primary AM were isolated by lavage and exposed ex vivo +/- 24h Mtb prior to assessment of gene and protein expression of innate immune factors by PCR and immunofluorescence (IF).

Results: Gene expression of cytokines responsible for innate immune response (TNFα, IFNγ, IL-1β, TLR2) were significantly (p<0.05) increased from baseline in response to Mtb exposure. However, when compared to controls, these factors did not rise appropriately in response to Mtb in either model system. Additionally, TLR2 levels were impaired in Mtb- and Mtb+ alcohol-fed AMs by IF. Similar effects were seen in IL-12, a key cytokine for adaptive immune activation. Activation state of AM from alcohol-fed rats was also impaired in response to Mtb, as reflected by a markedly diminished ratio of iNOS:Arg1 gene expression.

Conclusions: Alcoholic impairs multiple domains of the AM response to Mtb, including inflammatory cytokine release, adaptive immune activation, and macrophage activation state. Future studies will determine which of these domains play the larger role in predisposing people with AUD to TB.

12:06 – 12:12 p.m.
**#9 – Outcomes with Impella 5.5 and 5.0 in Cardiogenic Shock**  
Franck Azobou Tonleu, Zapata D, Daneshmand M, Laskar S, Staloch D, Agrawal A.

Background: Cardiogenic shock is associated with a mortality rate between 40-60%, and as high as 70% in the setting of ST-elevation myocardial infarction.1-5 In patients with cardiogenic shock, mechanical support is often needed for temporary support as a bridge to decision. The Impella 5.0 and 5.5 (Abiomed, Danvers, Massachusetts) microaxial pumps are left ventricular assist devices (LVAD) that pull blood from the left ventricle into the ascending aorta.6 We sought to describe outcomes and potential complications associated with extended Impella 5.5 and 5.0 in cardiogenic shock.

Methods: We retrospectively evaluated patients who underwent implantation of Impella 5.0 and 5.5 in the operating room due to cardiogenic shock between August 1st, 2018 and December 31st, 2020 at our institution. Hemolysis was defined as plasma free hemoglobin level > 50 mg/dL, a lactate
The mean left ventricular ejection fraction (LVEF) was 13.3 ± 6.8%, with 58% of patients with EF 10% or less. The etiology was acute decompensated heart failure in 14 patients and acute myocardial infarction in 5 patients. The average duration of Impella 5.5/5.0 support was 12.5 days (1, 40). 6 patients (32%) had the device for > 14 days. 4 patients had Impella CP placed prior to 5.5 for 4.75 days (1,8). Two patients required support with extracorporeal membrane oxygenation (ECMO), both after CP but prior to 5.0. Seven patients (37%) were successfully bridged to either left ventricular assist device (LVAD) or heart transplantation on average of 13 ± 10.8 days after Impella insertion with 43% (6/14) of the 5.5 cohort, and 20% (1/5) of the 5.0 cohort. Overall survival rate was 32% (6/19) with rate of 36% (5/14) for Impella 5.5 and 20% (1/5) for Impella 5.0. Overall hemolysis rate was 47%, with 60% (3/5) in the 5.0 cohort and 43% (6/14) in the 5.5 cohort. Other complications included significant upper extremity neuropathy (1), improper positioning (6), hematoma (3), thrombus (1), and stroke (2). Conclusion: There is high mortality associated with cardiogenic shock. The Impella 5.0 and 5.5 can provide additional cardiac support and help with bridging to LVAD or heart transplantation. About a third of the patients were successfully bridged, but serious complications do occur with extended support, including hemolysis, hematoma, thrombus, and stroke. Six patients survived to discharge.

12:18 – 12:24 p.m.
#138 – Optimization of the discharge medication process at Grady Memorial Hospital
Stacey Watkins, Walton T, McCord B, Foland N

Aim Statement: To increase the use of Grady’s Release Readiness Order (RRO) for discharge medications filled by the Senior Care Pharmacy (SCP) by Internal Medicine providers from 63% to 85% by January 1st, 2021. Background: Grady has an onsite pharmacy, SCP, that frequently provides medications to patients being discharged from the inpatient setting. It has been identified that the time to get these medications filled and brought bedside to discharging patients, is a barrier to throughput for early discharges. Baseline Conditions: For years, the process for obtaining discharge medications involved a multistep and time-consuming process to get a paper discharge form physically down to SCP. In an effort to improve this process, a new electronic order, called the Release Readiness Order (RRO), was created to utilize the electronic medical record and replace an archaic paper-driven process starting July 1st, 2020. Problem Analysis: the use of the RRO by Internal Medicine providers in July 2020, the first month this order was available, showed that the RRO was used for less than half of hospital discharges. A Pareto chart analysis helped to understand why the RRO was not used by providers, leading to reanalysis of the data with removal of all discharges that did not utilize SCP. This highlighted missed opportunities for order use and thus identified the target for our intervention. Actions Take/Tests of Change: Through pointed education, via the EMR, starting in November 2020, Internal Medicine providers were reminded weekly on how to properly use the RRO.

Results: Following this intervention, run chart analysis confirmed special cause variation and thus a successful education initiative, as Internal Medicine provider use increased to 86.5% in December 2020.

Group XIII: Molecular profiles in lab & clinic

11:30 – 11:36 am
#26 – In vitro liver metabolism of herbal medicine mixtures
William Crandall, Liu KH, Lee CM, Morgan ET, Jones DP

Many chemicals present in herbal medicines and supplements are not completely characterized, with their biotransformation products largely unknown. These chemicals and their metabolites may have important bioactivities. For example, Kratom (classically Mitragyna speciosa), a plant native to Southeast Asia, is used traditionally for its stimulant and pain-relieving medicinal properties and contains over 40 indole alkaloids with differing bioactivities. The most abundant compound of Kratom is the indole-alkaloid, Mitragynine. When metabolized, a hydroxylated product of Mitragynine becomes more potent at the μ-opiate receptor than morphine. Recently, Kratom has gained popularity as a recreational drug in Western countries and due to its deemed potential for abuse, may be banned or more heavily regulated by the FDA. Current methods for identifying metabolites from complex mixtures are limited, since in vitro studies of chemical biotransformation are usually...
performed one chemical at a time. To better understand the complexity of herbal medicine metabolites, experimental and computational methods were developed for the generation and identification of biotransformation products using LC-HRMS based targeted and untargeted metabolomics. Due to the relatively well-characterized metabolic profile of Kratom, it was selected for methods development in this study. We compared the in vitro metabolic products of three individual pure compounds to the products formed from entire mixture metabolism. Here, we show the capability of detecting multiple metabolite markers of a mixture in an untargeted manner. These methods could be applied for the creation of biomarker profiles for herbal medicines and supplements to assist in the detection of usage in the clinic.

11:36 – 11:42 am

#35 – High resolution metabolomics highlights differences in lipid and nutritional metabolism across the leprosy spectrum providing avenues for advances in leprosy host-pathogen research

Jessica Fairley, Ferreira JA, Ziegler TR, Jones DP, Fraga LA, Lyon S, Collins JM

High resolution metabolomics (HRM) has led to better understanding of host-pathogen interactions of many infectious diseases but has rarely been used in leprosy. Thousands of small molecules from endogenous metabolism, diet, the environment, medications, the microbiome, and pathogens can be detected through HRM and advanced data extraction. Our objectives were to identify unique metabolic signatures related to leprosy and to increase our understanding of associated nutrient metabolism. Between June 2018 and December 2019, adults newly diagnosed with leprosy and healthy controls were recruited from leprosy referral clinics in Minas Gerais, Brazil. Plasma samples were drawn, frozen, and shipped to the Clinical Biomarker Laboratory at Emory University. Metabolites were detected using an established HRM platform and characterized by accurate mass m/z and retention time. The Mummichog informatics package was used to compare metabolic pathway activity between groups. Additionally, select individual metabolites were quantified and compared. Analyses controlled for age and sex. Sixty-seven individuals with leprosy were enrolled of which 26 (62% of cases) were multibacillary (MB), 16 were paucibacillary (PB), and 25 were controls (including 16 household contacts). Exploratory analysis of metabolic pathways showed several statistically significant differences between groups: arachidonic acid metabolism between cases vs controls (p = 0.01); vitamin E (p=0.007) and retinol metabolism (p=0.04) between cases and contacts; and vitamin D3 metabolism between MB and PB (p=0.004). In addition, plasma tryptophan concentrations were lower in MB vs PB, consistent with an increase in catabolism by indoleamine-2,3-dioxygenase. These metabolic signatures provide insight into leprosy host-pathogen interactions that will improve our understanding of the pathophysiology of infection that could lead to improved diagnostics and therapeutics. HRM is, thus, an innovative tool for a neglected pathogen and these preliminary data provide a foundation for a wide range of future studies.

11:48 – 11:54 am

#28 – Clinical utilization of DiaSorin molecular PCR in pneumocystis pneumonia

Gregory Damhorst, Broder KJ, Overton EC, Rara R, Busch L, Burd EM, Webster AS, Kraft CS, Babiker A

Background: Pneumocystis jirovecii polymerase chain reaction (PCR) testing is a sensitive diagnostic tool but does not distinguish infection from colonization. Threshold cycle (Ct) may correlate with fungal burden and could be considered in clinical decision making. Clinical use of PCR and significance of Ct values have not previously been examined with the DiaSorin Molecular platform. Methods: Retrospective review of P. jirovecii PCR, Ct values and clinical data from 18 months in a multi-hospital academic health system. The diagnostic performance of PCR with respect to pathology and clinical judgment of the treatment team was examined. Results: Ninety-nine (9.8%) of 1,006 assays from 786 patients in 919 encounters were positive. Among 89 (9.6%) encounters in which PJP was treated, forty (45%) were influenced by positive PCR. Negative PCR influenced discontinuation of therapy in 35 cases. Sensitivity and specificity of PCR were 88% (CI, 79–94%) and 98% (CI, 97–99%) with respect to treatment decision and 93% (CI, 68–100%) and 94% (CI, 91–96%) with respect to pathology. Ct values from deep respiratory specimens were significantly different among treated patients (p=0.03) and those with positive pathology results (p & lt; 0.0001) compared to patients not treated and those with negative pathology, respectively, and was highly predictive of positive pathology results (AUC = 0.92).Conclusions: P. jirovecii PCR was a highly impactful tool in the diagnosis and management of PJP and use of Ct values may
have value in the treatment decision process in equivocal cases. Further investigation in a prospective manner is needed.

11:54 – 12:00 pm

**#102 – Plasma high resolution metabolomics links linoleic acid-related metabolic pathways with bone mineral density among postmenopausal women**


Background: Estrogen decline after the menopause can lead to osteoporosis, a risk factor for bone fracture. Using plasma high resolution metabolomics (HRM), we have previously shown that in a general population bone mineral density (BMD) is inversely correlated with the dietary fatty acid, linoleic acid. Here, we utilized plasma HRM to investigate if linoleic acid-related metabolic pathways are associated with BMD at specific sites in postmenopausal women without osteoporosis.

Methods: This cross-sectional study included 35 women (mean age: 58.3 ± 4.5 years). Fasting plasma samples were analyzed using hydrophilic interaction liquid chromatography and mass spectrometry. BMD at the lumbar spine, both femoral necks, and total hip were measured by dual energy X-ray absorptiometry and BMD T-scores derived. Linear regression was used to identify plasma metabolites significantly associated with each T-score. Pathway analyses were used to determine metabolic pathways that were significantly enriched with metabolites associated with each T-score. Results: Lumbar spine T-score was significantly associated with 388 metabolic features and four pathways, including linoleic acid and arachidonic acid metabolism. Femoral neck T-score was significantly associated with 383 metabolic features and four pathways, including linoleic acid and arachidonic acid metabolism. Total hip T-score was significantly associated with 482 metabolic features, linoleic acid metabolism and three other fatty acid-related pathways. Conclusion: Linoleic acid and arachidonic acid metabolic pathways are significantly associated with site-specific BMD T-scores in a population at risk for osteoporosis.

Further studies are needed to determine if these pathways are causal and/or potential indicators of postmenopausal bone health.

12:00 – 12:06 pm

**#106 – Markers of beta-cell death and insulin secretion in Ketosis-Prone Diabetes (KPDM)**


Half of obese Black individuals present with diabetic ketoacidosis (DKA) at new-onset of diabetes achieve insulin remission (fasting blood glucose [FBG<130mg/dl and HbA1c<7%, off insulin therapy>1 week) with intensive insulin treatment due to improved pancreatic beta-cell secretion. Controversy exists whether KPDM is type 1 or type 2 diabetes and if beta-cell death leads to DKA and beta-cell secretion. Circulating unmethylated/methylated insulin DNA ratio (unMeth/MethINS) was correlated with beta-cell death and beta-cell secretion in patients at high risk for type 1 diabetes. We hypothesized that higher circulating unMeth/MethINS at presentation of DKA correlates with decreased beta-cell secretion.

Obese Black individuals presenting with DKA without GAD-65 antibodies had serum unMeth/MethINS levels measured 3-4 days after hospital discharge (Visit 1, n=22). Beta-cell secretion was measured with glucagon stimulation tests performed at Visit 1 and Visit 2 (insulin remission, n=19) and calculated as 6-min (maximum [Max]) and Delta (Max-baseline) C-peptide levels. At Visit 1, mean age was 38±12 years and 7(32%) were female. Mean BMI was 39.4 ±10.6 kg/m2 with mean baseline HbA1c of 12.4±1.8%. C-peptide levels increased significantly from Visit 1 to Visit 2 with median (minimum and max): Max (Visit 1: 2.94 [0.65, 12.07] vs Visit 2: 5.87 [1.83, 12.11] ng/ml, p=0.011) and Delta (Visit 1: 1.57 (0.24, 6.88) vs Visit 2: 2.80 [0.46, 9.01], p=0.047). UnMeth/MethINS at Visit 1 was not significantly correlated (Spearman) with C-peptide levels at Visit 1 to Visit 2 with median (minimum and max): Max (Visit 1: 2.94 [0.65, 12.07] vs Vis...
12:06 – 12:12 pm

#119 – Descriptive case series of FIB-4 and APRI values HIV/Chronic Hepatitis B (CHB)-coinfected patients with positive hepatitis B surface antigen and anti–HBs Antibodies (sAg+ Ab+)
Eudora Olsen, Raha Sadjadi, Lee F, Nguyen MLT

Background: 10 – 25% of patients with chronic hepatitis B (CHB), defined as detectable surface antigen (sAg) or viral DNA for > 6 months, may have persistently positive sAg and sAb. FIB-4 and APRI scores are surrogates for chronic advanced liver disease used by clinicians serving HIV patients. We describe longitudinal FIB-4 and APRI in patients with HIV and CHB with sAg+ sAb+.

Methods: This is an IRB approved case series of HIV/CHB co-infected patients with sAg+ sAb+. Emory’s Center for AIDS Research registry was queried for demographics, medication adherence, HBV serologies, and HIV metrics from 2006–2018. Mean values with standard error are reported; paired t-test found no significance in aggregate and subgroup analysis. Results: Of 10,331 HIV positive patients queried, 338 (3%) had CHB, of which 26 (7.7%) had coexistent sAg+ sAb+. 5 (19%) had persistent sAg+ and sAb+: 13 (50%) became sAg negative; and 8 (31%) became sAb negative. These cohorts had similar demographics. Average time between first and last serologic data was 107 months (range 30–176 months; SD 44.2; SE 8.86). Mean FIB-4 score was greater than 1.3 in all cohorts at first sAg+. This decreased, though not significantly, in all cohorts except those with persistent sAg+ sAb+. This group also had the lowest ARV compliance. Average APRI scores remained stable. Conclusion: The prevalence of sAg+ sAb+ among our HIV/CHB coinfected patients was 7.7%. While most had high FIB-4 and APRI scores at the time of first detected HBsAg+, FIB-4 decreased over time except in those who remained sAg+ and sAb+. This may be related to ARV compliance, as the chronic sAg+ sAb+ cohort had the lowest ARV compliance. Future studies may inspect degree of hepatic fibrosis, risk of hepatic decompensation, and HCC incidence in this population.

12:12 – 12:18pm

#86 – Atorvastatin and blood flow regulate expression of distinctive sets of genes in mouse carotid artery endothelium
Sandeep Kumar, Sur S, Perez J, Demos C, Kang DW, Kim CW, Hu S, Xu K, Yang J, Jo H

Background: Hypercholesterolemia is a well-known pro-atherogenic risk factor, and statin is the most effective anti-atherogenic drug that lowers blood cholesterol levels. However, despite systemic hypercholesterolemia, atherosclerosis preferentially occurs in arterial regions exposed to disturbed blood flow (d-flow), while the stable flow (s-flow) regions are spared. Methods: Given their predominant effects on endothelial function and atherosclerosis, we tested whether 1) statin and flow regulate the same or independent sets of genes and 2) statin reverses d-flow-regulated genes in mouse artery endothelial cells in vivo. To test the hypotheses, C57BL/6J mice (8-week-old male, n=5 per group) were pre-treated with atorvastatin (10mg/kg/day, Orally) or vehicle for five days. Thereafter, partial carotid ligation (PCL) surgery was performed to induce d-flow in the left carotid artery (LCA), and statin or vehicle treatment was continued. The contralateral right carotid artery (RCA) remained exposed to s-flow to be used as the control. Two days or two weeks post-PCL surgery, endothelial-enriched RNAs from the LCAs and RCAs were collected and subjected to microarray gene expression analysis. Results: Statin treatment in the s-flow condition (RCA+statin versus RCA+vehicle) altered the expression of 667 genes at 2-day and 187 genes at a 2-week time point, respectively (p<0.05, fold change (FC) > ±1.5). Interestingly, statin treatment in the d-flow condition (LCA+statin versus LCA+vehicle) affected a limited number of genes: 113 and 75 differentially expressed genes at 2-day and 2-week time points, respectively (p<0.05, FC > ±1.5). Moreover, statin treatment did not reverse d-flow-regulated genes except for a small number of genes. These findings indicate that both statin and flow play important independent roles in atherosclerosis development and highlight the need to consider their therapeutic implications for both.
Introduction: Medication non-adherence is a major barrier amongst renal transplant recipients, and improvement can be seen after reduction in pill burden. Belatacept versus tacrolimus-based immunosuppression has shown renal preservation and improved cardiovascular and metabolic outcomes. We aimed to compare the daily pill burden in patients on belatacept versus tacrolimus-based regimens. Methods: We performed a single center retrospective analysis of kidney transplant recipients who were transplanted January 2017 through January 2019. Patients with failed allograft, death, or <1 year of follow-up were excluded from the study. Using t-tests and ANOVA, we compared 4 groups based on immunosuppression regimen: belatacept, tacrolimus, tacrolimus to belatacept conversion, and belatacept to tacrolimus conversion. Results: 432 patients were included in this study: belatacept (n=74), tacrolimus (n=330), conversion to belatacept (n=21), and conversion to tacrolimus (n=7). All groups were similar in demographics. (TABLE1). The number of oral medications and daily pill burden at discharge was similar across all groups. A significant reduction in number of medications [Median 8 (IQR 6-11) pills, p = 0.001] and pill burden [Median 11 (IQR 9-15) pills, p<<0.001] was observed amongst recipients on belatacept. A reduction in number of medications [Median 7(IQR 5-9) pills, p = 0.001] and daily pill burden [Median 11 (IQR 7-15) pills, p<0.001] was also observed in patients converted from tacrolimus to belatacept. Conclusion: Belatacept should be the immunosuppression of choice amongst all eligible kidney transplant recipients to reduce pill burden and potentially improve medication adherence.

Background: Numerous heavy metals contribute oxidative stress and interact with endogenous thiols, such as the glutathione (GSH) and cysteine (Cys) systems, which are important to antioxidant defense. Phytochelatins are a class of plant-derived metal chelating agents found in a variety of plant-based foods, and they are formed from polymerization of GSH. Despite their well-defined protective properties in plants, the impact of dietary phytochelatins against heavy metal exposures in an animal system is poorly understood. Aim: To determine the impact of phytochelatins on thiol oxidation driven by presence of heavy metals. Methods: Bovine aortic endothelial cells were cultured in 6-well plates. Cells were exposed for 2 hours to either Cd2+, Ag1+, Hg2+ or AsO2- at 5 and 10 μM concentration, with a no metal control. Additionally, cells were co-incubated with the prior doses alongside 10 μM phytochelatin 2, the simplest and most ubiquitous phytochelatin. After exposure, cells were assayed for GSH, glutathione disulfide, Cys and cysteine disulfide by HPLC as S-carboxymethyl, N-dansyl derivatives with γ-glutamyl-glutamate as internal standard. Redox potentials of thiol systems were calculated using the Nernst equation. Redox potentials were compared by Student’s T-test, with a Bonferroni-corrected α set at 0.0025. For all groups, n = 3. Results: Addition of phytochelatin 2 resulted in increased reduction of the GSH pool in cells exposed to 5 and 10 μM Ag1+ by 22.5 (p < 0.0001) and 37.6 mV (p < 0.0020), respectively. Conclusions: Phytochelatin demonstrates a protective effect against oxidation of thiols due to Ag1+ exposure, likely due to phytochelatins' capacity for chelation of silver. This suggests that dietary phytochelatins are protective against dietary exposures to silver.

Lymphatic drainage inherently modulates cardiac function by maintaining the immune response and tissue-fluid homeostasis. During cardiac transplantation, the lymphatic collecting vessels are severed at the time of donor heart excision and not surgically reconstructed in the recipient. We hypothesize disruption of lymphatic drainage after cardiac transplantation potentiates chronic inflammation by impeding the egress of immune cells out of the myocardium exacerbating transplant rejection. Methods: A heterotopic abdominal heart transplant (HAHT) rodent model permitted evaluation of lymphatic drainage via intramyocardial injection of 2000 kDa fluorescein isothiocyanate (FITC)-dextran. The fluorescently...
Candida auris is an emerging, highly virulent fungal pathogen that is often resistant to multiple classes of antifungals. Echinocandins are the recommended first-line treatment for systemic C. auris infections, followed by a switch to amphotericin B for isolates that fail echinocandin therapy. However, echinocandin resistance has increasingly been observed. We hypothesized that the combination of micafungin and amphotericin B would be effective in inhibiting C. auris clinical isolates. Using 10 C. auris isolates from the CDC/FDA AR Bank, we assayed for 1) their MICs to micafungin alone or in combination with amphotericin B using broth microdilution, 2) tested for synergy using the checkerboard assay, and 3) tested the effect of micafungin pretreatment on the efficacy of micafungin/amphotericin B combination treatment. We observed that the micafungin and amphotericin B combination caused a significant reduction (up to 64-fold) in the MIC of all the isolates compared to micafungin alone. The combination was synergistic in 8 out of the 10 isolates, with FICs ≤ 0.5. Finally, the combination was effective against the isolates that were grown in the presence of micafungin. These findings suggest that addition of amphotericin B to initial micafungin therapy may be more effective than a switch to amphotericin B monotherapy in cases of echinocandin failure, and that micafungin/amphotericin B combination therapy may have clinical utility against broadly resistant C. auris isolates.
of long-lasting protective immunity and responses to re-infections.

12:06 – 12:12 pm

#6 – TGFβ2-mediated cardiac fibroblast activation is dependent on BET bromodomain proteins

Andrew Antolic, Jiao Z, Ijaz T, Burke MA

Background: Cardiac fibrosis is a key feature of dilated cardiomyopathy (DCM). Stress signaling triggers activation of quiescent fibroblasts to myofibroblasts. Bromodomain and extraterminal (BET) epigenetic reader proteins integrate stress-responsive signaling. We explored the role of BETs on inflammatory signaling in cardiac fibroblasts.

Methods: Fibroblasts were isolated from wild type (WT) hearts using the Langendorff procedure. Cells were treated with vehicle, the BET inhibitor JQ1, or siRNA targeting Smad3 or Rela (to inhibit TGFβ and NFκB pathways) followed by TGFβ2 stimulation. Gene expression was assessed by QPCR, α-smooth muscle actin (αSMA) was quantified by ICC, and NFκB transcription was evaluated by luciferase reporter assay. The interaction between BRD4 (a BET protein) and SMAD3 was assessed by coimmunoprecipitation (coIP) in WT or DCM mice treated with JQ1 or vehicle.

Results: TGFβ2 activated fibroblasts (increased expression of: Acta2, 9.0-fold; Col3a1, 3.6-fold; Postn, 12.8-fold; and increased αSMA 1.5-fold; p<0.05 vs. vehicle for all). This was ablated by JQ1 and Smad3 siRNA. CoIP demonstrated an interaction between BRD4 and SMAD3 in DCM hearts that was prevented by JQ1. By contrast, Rela siRNA alone induced myofibroblast gene expression (Acta2, 6.9-fold; Col3a1, 7.0-fold; Postn, 11.2-fold; and increased αSMA 3.4-fold; p<0.05 vs. vehicle for all). This effect of Rela siRNA was potentiated by TGFβ2 (increased expression of: Acta2, 17.1-fold; Col3a1, 7.1-fold; Postn, 42.5-fold; and increased αSMA 2.7-fold; p<0.05 for all vs. vehicle). Finally, TGFβ2 inhibited NFκB-driven gene transcription (-2.9-fold; p<0.05 vs. vehicle).

Conclusions: These data identify a critical role for BETs in TGFβ2-mediated cardiac fibroblast activation and suggest that NFκB may modulate this response.

12:12 – 12:18 pm

#117 – Regulation of the horizontally transferred ispD gene in the Neisseria meningitidis Urethral Clade US_NmUC

Emilio Rodriguez, Tzeng YL, Stephens DS

The exclusively human pathogen Neisseria meningitidis (Nm) causes over a million cases of meningococcal disease annually, resulting in 135,000 deaths. Nm typically colonizes the nasopharynx but since 2013 there have been an increase in cases of meningococcal urethritis, originally presumed to be caused by the urogenital pathogen Neisseria gonorrhoeae (Ng). This emerging group of urethral Nm has been designated the US Nm urethritis clade, US_NmUC. Whole genome sequencing of over 200 US_NmUC isolates revealed that the Nm ancestor underwent recombination with Ng, including the integration of a 3.3 kb segment of gonococcal DNA into the meningococcal genome; the 3.3 kb segment contains 5 genes that are part of a larger 9-gene operon. Preliminary data showed that one of the recombined gonococcal alleles, the terpenoid precursor synthesis pathway gene ispD, has a 50-fold higher expression in US_NmUC isolates compared to non-US_NmUC meningococci, while the genes flanking ispD do not have altered expression. To determine if the increased expression of ispD in US_NmUC was the result of newly created promoters, LacZ reporters of variable promoter lengths spanning the beginning of the operon to the 5’ region of ispD were used to measure promoter activities by a β-galactosidase assay. Translational reporters of clade and non-clade Nm upstream sequences of ispD showed comparable activity, suggesting that the difference in ispD expression was not a result of increased transcription in US_NmUC isolates. IspD has been shown to be essential in several gram-negative bacteria including E. coli and Salmonella enterica. Viable ispD deletion mutants were only successfully generated in a strain with ispD complemented at a distinct genomic location, indicating that ispD was essential in the clade. The biological consequence of integrating the gonococcal ispD into US_NmUC remains under investigation.
#20 – An IgD- CD27- (DN) B cell subset lacking expression of CD21- and CD11c- expands in SLE and is enriched in antibody secreting cell precursors

Background: The induction and maturation of antibody secreting cells (ASCs) is a hallmark of systemic lupus erythematosus (SLE). However, the origins of these ASCs, in which many are autoreactive, is still poorly understood. The recent elucidation of the extrafollicular B cell pathway (mostly activated naïve and DN B cell subsets) and their importance in the disease pathogenesis of SLE has generated a novel paradigm of targetable therapeutics. One such DN subset that remains to be characterized is a population (coined DN3) lacking CD21 and CD11c expression; canonical markers of DN1 and DN2 subsets respectively.

Aims: To determine disease associated attributes of DN3 expansions in SLE patients and characterize the functionality of the subset with respect to other DN B cell populations.

Methods: PBMCs were isolated from SLE patients and underwent FACS analysis, as well as UMAP dimensionality reduction on surface phenotypes. DN3 B cells were FACS sorted and cultured for Ig ELISpot analysis.

Conclusions: DN3 B cells significantly expand in SLE and weakly correlate with patient disease activity. The expanded phenotype of a subset of these cells reveals increased expression of HLA-DR, negative regulators, CD38, and a reduction/lack of B cell defining characteristics such as CD20 and Ig surface expression. Additionally, as well as displaying increased size and granularity, a significant proportion of DN3 B cells exhibit ad libitum Ig secretion, a feature attributed to ASCs. These data identify DN3 B cells as a source of ASC development and a novel therapeutic targeting opportunity in the treatment of SLE.

#24 – Implementation of long-acting injectable Cabotegravir/Rilpivirine for HIV-1 treatment at a Ryan White-funded clinic in the U.S. South
Lauren Collins, Corbin-Johnson D, Asrat M, Rankins T, Harrison L, Condra A, Sumitani J, Smith BL, Armstrong WS, Colasanti JA

Introduction: In January 2021, the first ever long-acting injectable (LAI) antiretroviral therapy (ART), cabotegravir/rilpivirine (CAB/RPV), was approved for maintenance HIV-1 treatment in select patients with virologic suppression. LAI-ART has the potential to improve ART adherence, reduce HIV stigma, and promote equity in care outcomes, however, implementation in real-world settings has yet to be evaluated.

Methods: We launched a pilot LAI-ART program at the largest Ryan White-funded HIV clinic in the Southeast. From 4/14/21 to 5/14/21, providers referred patients interested and willing to switch to LAI-CAB/RPV who met screening criteria. Our interdisciplinary LAI team (Clinician-Pharmacy-Nursing) verified clinical eligibility (HIV-1 <200 c/ml ≥6 months and no history of virologic failure, resistance to either drug, or chronic HBV infection) and pursued medication access for 28-day oral lead-in and monthly injectable CAB/RPV.

We describe demographic and clinical variables of referred PWH and early outcomes in accessing LAI-ART.

Results: Among 42 referrals, median age was 40.5 (Q1-Q3, 32-52) years, 83% were men, and 76% Black. Payor source distribution was 26% Private, 19% Medicare, 10% Medicaid, and 45% ADAP. At the time of referral, median CD4 count was 583 (Q1-Q3, 422-742) cells/mm3 and median sustained HIV-1 RNA <200 c/ml was 1427 (Q1-Q3, 961-2534) days. A total of 35 patients (74%) met clinical eligibility for LAI-CAB/RPV, including 4 patients who required a transition off proton pump inhibitor therapy to accommodate oral RPV. Ineligible PWH were excluded due to evidence of RPV resistance (n=5), possible RPV hypersensitivity (n=1), and HIV non-suppression (n=1). The table summarizes the process of pursuing LAI-ART access for the initial 10 enrollees by insurance status.

Conclusions: Our experience implementing LAI-ART at a Ryan White-funded HIV clinic in the Southern U.S. has been challenged by substantial human resource capital to attain drug, delayed therapy initiation due to insurance denials, and patient ineligibility primarily due to concern for potential RPV
resistance. These barriers may perpetuate disparities in ART access and virologic suppression among PWH and need to be urgently addressed so that LAI-ART can be offered equitably.

11:36 – 11:42 am
#131 – Adherence to institutional diagnostic stewardship tool for Clostridioides difficile testing
Joseph Torrisi, Drwiega E, Rab S, Advani S, Kandiah S

Grady Health System (GHS) implemented a C. difficile infection (CDI) diagnostic stewardship tool to improve accurate diagnosis of infection and prevent unnecessary treatment in colonized patients. The components of this tool include questions about patient stool burden, receipt of laxatives, and initiation of tube feeds that must be answered prior to ordering the C. difficile test. This study aims to assess providers’ adherence to the CDI diagnostic tool at GHS. A retrospective chart review of 250 C. difficile tests performed between February 18, 2019 and February 17, 2020 was conducted. The primary outcome was the percent of C. difficile tests ordered that met composite adherence to the diagnostic stewardship tool. Composite adherence was defined as patients having > 3 stools in 24 hours without receipt of laxatives for 48 hours or initiation of tube feeds in 72 hours. Of the 250 evaluable tests, 67% (n = 167) met composite adherence to the diagnostic stewardship tool. The most common reasons for non-adherence included a lack of stool documentation (n = 62) or the receipt of laxatives (n = 34). Forty-one (89%) of the 46 patients with positive tests that didn’t meet composite adherence for testing, received CDI treatment. Patients with positive CDI tests not meeting composite adherence had a median infection-related length of stay of 13 days compared to 6 days for those meeting adherences. Providers maintained adherence to the diagnostic stewardship tool for most CDI tests. Education to providers about laxative discontinuation prior to testing and nursing about the importance of quantifying stools in the medical chart is an area of improvement that may reduce the number of inappropriate CDI tests.

11:42 – 11:48 am
#137 – Susceptibility and exposure to Leprosy: An examination of nutrient deficiencies, parasitic coinfection, and WASH conditions

Despite extensive control measures and a declining number of human reservoirs, continued incidence of leprosy in excess of 200,000 new infections each year suggests that alternative pathways may play a role in continued endemicity. Nutritional deficiencies, parasitic coinfection, and limited WASH have been suggested to predispose individuals to M. leprae infection. To further explore this hypothesis, leprosy cases and uninfected controls were recruited from areas around North Gondar, Ethiopia throughout 2019. Participants completed dietary and WASH surveys in addition to providing stool for Kato Katz, urine for Schisto POC-CCATM rapid diagnostic testing and blood for micronutrient biomarker testing. A total of 80 men (59%) and women (41%) participated in this study with an average age of 40 (SD 15.0 years). Most leprosy cases were multibacillary (93.3%). There was a high prevalence of undernutrition among cases and controls, with 32.1% of participants classified as underweight. Food shortage [OR 4.57, 95% CI (1.62, 12.89)] and fewer meals consumed per day [OR 3.85, 95% CI (1.17, 12.67)] were both significantly associated with leprosy in the univariate analysis. Additionally, 64.1% of the study population tested positive for a helminth and WASH insecurities were widespread. On multivariate analysis, lack of soap [aOR 2.53, 95% CI (1.17, 5.47)] and lack of toilet facilities [aOR 2.32, 95% CI (1.05, 5.12)] were significantly associated with leprosy. Positive directionality was identified for a number of other inputs, including helminth infection [aOR 3.23, 95% CI (0.85, 12.35)]. Taken together, these findings strengthen previous research conducted in 2018 implicating WASH as a driver of leprosy infection. Subsequent micronutrient results will be integrated to further explore nutritional risks and build upon the significant macronutrient findings from this analysis. Given that leprosy remains the leading infectious cause of disability in the world, future research should explore all of the above susceptibilities in more depth in order to curtail the global burden of disease.
#132 – Pioglitazone improves impaired oxygen utilization in platelets from patients with precapillary pulmonary hypertension
Aaron Trammell, Smith MR, Murphy TC, Gillespie JE, Yeligar SM, Sutliff RL, Hart CM

Background and Aims: Pulmonary hypertension (PH) is defined as elevated pressure in the pulmonary circulation. It frequently complicates chronic lung disease (PH-CLD) and rarely results from obliteration of small pulmonary vessels, so-called pulmonary arterial hypertension (PAH). Patients with PH survive about 4 years and common forms of PH including PH-CLD have no effective treatment. Altered cellular energy metabolism is implicated in development and progression of PH. Therapeutic correction of disturbed energy metabolism in PH has not been widely explored as a treatment approach. In this translational study, we measured parameters of mitochondrial respiration in platelets from humans with PH and assessed response to the metabolically active drug pioglitazone. Methods: We enrolled participants with chronic lung disease with PH and healthy controls, collected blood, and isolated platelets by centrifugation. Platelet mitochondrial respiration at basal state and in the presence of mitochondrial inhibitors was determined by extracellular flux analysis. The effect of acute ex vivo pioglitazone was assessed at concentrations comparable to therapeutic dosing in humans. Results: We measured oxygen consumption of platelets in 16 participants: 12 with PH and 4 healthy controls. We observed reduced mitochondrial oxygen consumption among participants with PH compared to controls. Among those with PH, acute ex vivo treatment of platelets with pioglitazone 1 μM increased basal oxygen consumption (paired Wilcoxon signed rank test P=0.042). Conclusions: These preliminary results suggest that impaired mitochondrial energy metabolism tightly associated with the pathogenesis of PH-CLD may be improved with pioglitazone, a safe and clinically available metabolic therapy.

#112 – Examine the role of slc2a3b+ cells in macrophage clearance and heart regeneration
Elizabeth Peterson, Sun J, Wang J

Background: Cardiac injury rapidly induces stress and injury responses in both mammals and zebrafish. However, mammals undergo heart remodeling while zebrafish quickly induce regeneration programs. As successful heart restoration requires transitioning to regeneration and immune cells quickly mobilize to the injury site, we speculated that these cells and their regulators are critical for this transition. Methods: To determine when cardiomyocyte (CM) proliferation starts, we conducted Mef2/PCNA staining with heart sections after cardiac injury. We also used the mpeg1:mCherry reporter and IB4 immunostaining to examine the macrophage response. We conducted scRNA-seq on the spleen before and after cardiac injury. We created the slc2a3b:EGFP BAC fluorescence reporter to perform histological and transcriptional assays with slc2a3b+ cells after cardiac injury. We also generated several genetic tools to examine the phagocytic slc2a3b+ immune subpopulation. Results: Macrophages mobilized to the injury site and then disintegrated from 1-3 dpa, which coincided with CM proliferation starting at 3 dpa. To identify macrophage clearance factors, we analyzed the spleen with scRNA-seq and found expansion of slc2a3b-expressing cells after injury. With our slc2a3b:EGFP reporter we found that slc2a3b+ cells accumulated and engulfed macrophages at the injury site in a "Cell-in-Cell" structure between 1 to 3 dpa. scRNA-seq of slc2a3b+ cells revealed a phagosome-enriched leukocyte cluster, with specific cathepsin D (ctsd) expression. We identified several founder fish for ctsd reporter and mutant lines for future studies. Conclusions: slc2a3b expression correlates with early cardiac regeneration, labels immune cells, and engulfs early macrophages in a structure suggestive of efferocytosis.

#128 – Zebrafish hearts regenerate after genetic coronary injury
Jisheng Sun, Jiao C, Wang J

Zebrafish fully regenerate after heart damage. Different injury models for cardiac tissues have been developed in the past 20 years. Although coronary endothelial dysfunction is present in most patients with acute coronary syndrome, methods to injury zebrafish coronary vasculature have not been established, due to the surgery difficulty of tiny coronary vessels and the lack of genetic tools to specifically manipulate coronary cells. To remove this roadblock, we first identified that the Notch ligand deltaC gene regulatory sequences specifically drive gene expression in coronary endothelial cells. With this genetic element, we established a coronary endothelial genetic ablation methodology. We found that severe coronary
endothelial cell loss resulted in fish death, while fish with mild coronary cell loss can survive. In the survived fish with coronary dysfunction, compact muscle loss happened, and ventricular wall was disorganized. Regeneration responses have been triggered in myocardial, endocardial, epicardial, and immune cells. The damaged cardiac is fully restored within several days. Furthermore, utilizing the advantage of deltaC:EGFP reporter showing coronary vessels without endocardial background, we adapted an ex vivo system for high resolution live image of coronary growth and re-growth. We visualized robust coronary growth in juvenile heart surface and coronary re-growth in the wounded area of adult heart. Coronary growth ex vivo reflects in vivo coronary vascularization because the growth can be inhibited by the reported vascular growth antagonist VEGF inhibitor, demonstrating the efficacy of this novel transgenic line for screening small molecules for coronary growth. Our work revealed coronary dysfunction-caused heart damage can be fully recovered in adult zebrafish and deltaC regulatory elements can be used for high resolution coronary experiments.

12:06 – 12:12 pm

#65 – Multi-year analysis of bone marrow plasma cells in systemic lupus erythematosus patients shows distinct patterns of persistent clones that may drive disease flares
Jennifer Hom, Tipton CM, Fucile CF, Rosenberg AF, Sanz I

Working with a longitudinal analysis of B cells in the bone marrow of individuals with systemic lupus erythematosus (SLE) over 5 years, we have discovered a strong bias in the persistence of specific plasma cell clones from year to year. The diversity in several SLE B-cell compartments in the marrow is heavily reduced and punctuated by expanded clones but display less SHM than healthy individuals. Remarkably, a large number of clones in SLE bone marrow plasma cells could be identified up to 5 years apart. A high number of VH4-34 clones were found in SLE patients, in some cases reaching 15% of the entire repertoire in SLE patients compared to less than 2% in healthy individuals. Also, a majority of identified VH4-34 clones were found to persist in the bone marrow plasma cells from year to year, and often with unmutated hydrophobic patches; a finding not replicated in healthy individuals. We conducted 10x single cell sequencing for gene expression analysis coupled to VDJ analysis of the bone marrow plasma cells and are in the process of examining differential gene expression between persistent and non-persistent plasma cell clones. In addition, we are synthetically producing several of the identified persistent clones and will conduct autoreactivity testing. By identifying specific longitudinal and potentially autoreactive clones in the bone marrow plasma cells of SLE patients, we can potentially begin to understand the underlying causes of intermittent disease flares, disease progression, identify new therapeutic targets, and develop novel diagnostics for the prediction of flares in disease activity.

12:12 – 12:18 pm

#77 – B cell subset composition as a potential predictor of Systemic Lupus Erythematosus flare

Background: B cells are a primary driver of Systemic Lupus Erythematosus (SLE), an autoimmune disease characterized by abundant autoantibodies. B cell homeostasis is perturbed in SLE patients, with an expansion of extrafollicular effector B cells (EXF). While patients with expanded EXF are more likely to have active disease, but it is unclear if this is a stable phenotype or transitory change during flaring disease activity. Methods: PBMC from SLE patients (n=422) and healthy control donors (HCD) were stained with an 11-color flow cytometry panel to identify B cell subpopulations. Hierarchical clustering was used to group patients by B cell phenotype. 32 SLE patients at risk for flare were also studied every 2 months over 1 year for B cell phenotype or transitory change during flaring disease activity. Results: SLE patients could be grouped into four clusters; C1, predominately class switched B cells; C2, expanded EXF; C3, HCD like; and C4; predominately immature transitional B cells. 2/3 of at-risk patients flared and 21% had a severe flare. Most patients with severe flares were in C2 (57%) and C1(28%) at baseline. Only 1 patient in C4(14%) and no C3, HCD like; patients experienced a severe flare. B cell phenotype remained stable during the study and changed little at time of flare. Conclusions: These results support a model in which B cell subset composition is stable and severe flares are more likely in patients with an expanded EXF. This is true even in patients already at risk for flare. Resting naïve B cells are already epigenetically dysregulated in lupus patients and stable epigenetic programs likely control both B cell phenotype and clinical characteristics. B cell subset composition may be a
useful biomarker for understanding SLE pathogenesis.

12:18 – 12:24 pm

#73 – Extrafollicular preference and faded memory in Multisystem Inflammatory Syndrome in Children (MIS-C) B cells
Yusho Ishii, Cashman KS, Anam FA, Sanz I

Background: Multisystem inflammatory syndrome in children (MIS-C) is a SARS-CoV-2 infection-associated condition with severely inflamed tissues and organs with similarity to Kawasaki disease whose pathogenesis can involve autoreactive antibody production. However, the relationship between MIS-C and B cells is still unclear. Aims: To figure out how B cells affect the pathogenesis of MIS-C, we assessed B cell populations and antibody production for SARS-CoV-2 specific antigens in MIS-C. Methods: Flow cytometric analysis and enzyme-linked immunosorbent assay (ELISA) were performed with samples from pediatric healthy controls (PHC), adult healthy controls (AHC), adult acute SARS-CoV-2 infection patients (ACA) and MIS-C patients. Results: MIS-C exhibited a trend of elevated transitional B cells and a high ratio of DN2 (IgD-/CD27-/CD11c+/CD21-)/DN1 (IgD-/CD27-/CD11c-/CD21+) B cells, suggesting a shift towards the extrafollicular B cell pathway, which is related to autoreactive B cell development. Moreover, memory B cells were significantly restricted in MIS-C. In memory B cells, IgA+ and IgD-only populations were expanded, along with repression of unswitched memory B cells. In line with this, the SARS-CoV-2 specific antibody was increased after the infection, but the antibody was attenuated few months after the infection. Furthermore, IgA ratio is increasing in the antibody for RBD antigen, which is different from adult. Conclusions: The severe inflammatory conditions in MIS-C skew B cell responses towards a similar pattern to flaring lupus; with high transitional and extrafollicular B cells and faded memory in B cells, suggesting a risk of autoreactive antibody production and the susceptibility to SARS-CoV-2 re-infection.

Group XVI: Novel methods in diagnostics, treatment, & management

11:30 – 11:36 am

#63 – Developing transgenic patient derived organoids for studying biliary pathophysiology
Connor Hogan, Gracz A

Mouse models have contributed significantly to the basic understanding of liver disease, but findings in these models may not translate directly to human patients. Patient derived organoids (PDOs) are generated from adult tissues and present an opportunity to supplement conventional mouse models in studies of liver injury and disease as well as capture patient-specific phenotypes. While PDOs facilitate more accurate modeling of in vivo phenotypes, they currently lack the powerful genetic tools available in mouse models. We hypothesized that CRISPR-Cas9 gene editing could be used to generate transgenic human intrahepatic cholangiocyte organoids (hiCOs). We utilized the CRISPPaint platform to generate transgenic “reporter” hiCOs for monitoring gene expression in living cells. CRISPPaint is a Cas9 dependent tagging system that allows for precise addition of universal molecular tags to specific genes of interest. To validate our approach and test the ability of CRISPPaint to generate transgenic hiCOs, we generated a novel universal donor plasmid expressing a fluorescent protein timer, FastFT. FastFT fluoresces blue upon translation and matures to red after an hour. We used FastFT to monitor proliferation in HepG2 and hiCOs by tagging HIST14HC, a gene encoding a core histone protein. We also generated a panel of guide RNAs targeting Sox9, a key biliary transcription factor, to monitor Sox9 expression dynamics and cellular heterogeneity in hiCOs. These studies provide proof-of-concept for transgenic hiCOs as tools for understanding biliary pathophysiology.

11:36 – 11:42 am

#68 – Biliary epithelium demonstrates distinct subpopulations that require Sox9 for proper morphology
Hannah Hrncir, Janto N, Chopra P, Gracz AD

The burden of liver disease impacts an estimated 50 million people globally, and effective treatments for liver failure are limited. Ductular reaction (DR) is a common phenotype of liver disease and injury that involves the proliferative expansion of biliary epithelial cells (BECs) and contributes to liver regeneration. BEC heterogeneity, including the precise nature of BECs contributing to DR, is poorly
understood due to the lack of robust biomarkers for BEC subpopulations. Our lab recently applied a Sox9EGFP transgene to define BEC heterogeneity based on EGFP expression levels, which are distinct between two subpopulations of BECs as well as peribiliary hepatocytes. Here, we hypothesized that BECs exhibit further heterogeneity within Sox9EGFP populations. We performed single cell RNA-sequencing, which revealed five distinct BEC clusters. To explore the functional role of Sox9 in BEC heterogeneity, we generated Sox9 conditional knockout mice (Sox9cKO; Sox9fl/fl:AlbCre). Sox9cKO mice undergo complete ablation of SOX9 in hepatoblasts during development, which persists into adulthood. Adult Sox9cKO mice demonstrate ductal paucity, which is a previously undescribed phenotype. This loss of normal bile duct anatomy suggests that Sox9 plays a role in regulating proper BEC numbers. These results demonstrate that BECs are heterogenous and dependent on Sox9 to establish a proper ductal network.

11:42 – 11:48 am

#78 – Differentially expressed circular RNAs in the lungs of sickle cell disease mice
Viranuj Sueblinvong, Chang SS, Park C, Benza RL, Archer DR, Sutliff RL, Hart C, Kang B

Rationale: Circular RNA (circRNA) regulates gene expression through binding to miRNAs. Pulmonary hypertension (PH) is a complication of sickle cell disease (SCD). We assessed the expression profiles of circRNAs and mRNAs in lungs of sickle cell (SS) mice that spontaneously develop PH. Methods & Results: CircRNA and mRNA profiles were analyzed in the lungs of 5 SS mice and 5 littermates (AA) using the Arrystar™ circRNA array V2 and Arraystar™ array. For circRNA, Agilent Feature Extraction software was used to analyze acquired images. Data were normalized in quantile method, processed, then volcano plot filtering was used to screen for differentially expressed (DE) circRNAs (Fold Change >1.5, p< 0.05). 21 circRNAs were upregulated and 127 circRNAs were downregulated in lungs of SS mice compared to AA mice. For mRNA, raw signal intensities were normalized in quantile method. Volcano plot filtering was used to screen for DE mRNAs (Fold Change >2.0, p< 0.05). 1,753 mRNAs were upregulated, and 1,455 mRNAs were downregulated in lungs of SS mice compared to AA mice. Database for Annotation, Visualization and Integrated Discovery bioinformatics analysis was used for Gene Ontology (GO) enrichment including biological process (BP), molecular function (MF), and cellular component (CC), and pathway analysis. GO analysis showed that the altered mRNAs were distinct to negative or positive regulation of BP, ion binding or organic cyclic compound binding in MF, and membrane-bounded organelle and vesicle and non-membrane-bounded organelle and intracellular organelle in CC. Pathway analysis revealed that MAPK pathway was associated with upregulated mRNAs, whereas C-type lectin receptor pathway was associated with downregulated mRNAs. circRNA-mRNA co-expression network analysis was evaluated by Coding-Non-coding gene co-expression network analysis and generated. Conclusions: These results identify new potential targets for therapeutic intervention in SCD and provide new insights into SCD pulmonary vascular dysfunction and PH pathogenesis.

11:48 – 11:54 am

#42 – Direct comparison of five AAV serotypes for intramuscular inoculation in rhesus macaques
Matthew Gardner, Farzan M

Use of adeno-associated virus (AAV) vectors in non-human primates is complicated by host immune responses that can limit transgene expression. Here we compared the expression of and anti-drug antibody (ADA) responses against the rhesus macaque derived, anti-SIV antibody ITS01 when delivered by AAV vectors from five different serotypes. We first observed that ITS01 expressed two-fold more efficiently in mice from AAV vectors in which heavy and light-chain genes were separated by a P2A ribosomal skipping peptide, compared with those using F2A or T2A peptides. We then measured the preexisting neutralizing antibody responses against three traditional AAV capsids in 358 rhesus macaques and observed that 8%, 16%, and 42% were seronegative for AAV1, AAV8, and AAV9, respectively. Finally, we compared ITS01 expression in seronegative macaques intramuscularly transduced with AAV1, AAV8, or AAV9, or with the synthetic capsids AAV-NP22 or AAV-KP1. We observed at 30 weeks after inoculation that AAV9- and AAV1-delivered vectors (2.5 x 1012 vg/kg) expressed the highest concentrations of ITS01 (224 µg/mL, n=5, and 216 µg/mL, n=3, respectively), whereas the remaining serotypes expressed an average of 34-73 µg/mL. Notable, ADA responses against ITS01 were only observed in six of the 19 animals. Importantly, the expressed ITS01 antibody was fully active, neutralizing SIVsmE660 pseudovirus with similar efficiency as recombinant ITS01. Overall, our data
suggest that the AAV9 capsid and the P2A peptide can improve expression of antibodies from muscle tissue.

11:54 – 12:00 pm

#147 – One-hour glucose during Oral Glucose Tolerance Test (OGTT) predicts hyperglycemia relapse in black obese patients with hyperglycemic crises

Zohyra Zabala, Jagannathan R, Smiley DD, Stefanovski D, Umpierrez GE, Vellanki P

Half of Black individuals with unprovoked diabetic ketoacidosis (DKA) or severe hyperglycemia (SH, blood glucose [BG]>400 mg/dl without ketosis) at new-onset of diabetes achieve near-normoglycemia remission (FBG < 130 mg/dl, HbA1c < 7%) with intensive insulin treatment. After remission, many patients experience hyperglycemia relapse (HR). We tested whether 1-h PG at remission predicts HR in obese Black individuals presenting with DKA or SH. Seventy-three Black individuals presenting with DKA (n=40) or SH (n=33) underwent a 2-h 75-gm OGTT after achieving remission and followed for a median of 58 weeks until HR (FBG>130 mg/dl, random BG>180 mg/dl, or HbA1c>7%). Insulin sensitivity (Si) was calculated from the oral minimal model. Disposition index (DI) was calculated by Si and area under the curve for insulin. The mean age was 47±10 years, mean BMI was 36.1±9.5 kg/m2, and 1-h PG 192±48 mg/dl. One-h PG was moderately correlated with Si (r=-0.26; P=0.02) and DI (r=-0.28; P=0.02). The highest Youden index for 1-h PG was 0.38, corresponding to an optimal cut-point of 199 mg/dl with 64% sensitivity and 71% specificity. Adjusted Cox hazards model showed that 1-h PG level>199 mg/dl was independently associated with increased HR (Hazard ratio: 2.61 [95% CI: 1.13-6.01]). In a multivariate model, adding 1-h PG level improved prediction of hyperglycemia relapse than 2-h PG level, with significant improvements in C index (Δ:+0.07; P=0.04) net reclassification index, and integrated discrimination index. 1-h PG at the time of remission is a better predictor of HR than fasting or 2-h PG among obese Black individuals presenting with DKA or SH. 1-h PG can identify individuals at high risk of developing hyperglycemia relapse.

12:00 – 12:06 pm

#97 – Performance evaluation of dexcom G6 continuous glucose monitoring and capillary blood glucose after hospital discharge in patients with diabetes


The efficacy of continuous glucose monitoring (CGM) after hospital discharge in patients with diabetes (DM) has not been established. This prospective pilot study compared glycemic outcomes between capillary blood glucose (CBG) and CGM after hospital discharge. At discharge, a blinded Dexcom G6 CGM was inserted in 82 patients with DM. Patients were asked to perform CBG testing (3-4/d) and to return the CBG logs and CGM device after 10 days of discharge. Patients were treated with insulin ± oral antidiabetic agents and followed by their primary care team. A total of 65 patients (73.3%) returned their CGM and were included (age 58.3±11 years, 56% Males, HbA1c 8.7±2%, 98% DM2). Only 42 patients (51.2%) returned CBG logs (mean 3.01±0.9 CBG/d). CGM detection of hypoglycemia < 70 mg/dl (46% vs. 26%, p=<0.001) and < 54 mg/dl (32% vs. 11%, p=<0.001) and nocturnal hypoglycemia (16% vs. 0%) was significantly higher compared to CBG testing. Glycemic outcomes are shown in Table 1. The results of this pilot prospective observational study indicate that use of CGM provides a better assessment of glycemic control than CBG after hospital discharge, with higher detection of overall and nocturnal hypoglycemic events, which are frequently undetected by CBG. Prospective studies are needed to determine the efficacy of real-time CGM in preventing hypoglycemic events after hospital discharge.

12:06 – 12:12 pm

#108 – FreeStyle libre in inpatient COVID-19 units

Reeni Pandya, Sukkari MA, Darin O

Background and Aims: Continuous glucose monitors (CGM) have demonstrated accuracy in outpatients and were accurate with pilot data using blinded systems in inpatients. Libre CGMs were approved and donated to hospitals for use during the COVID-19 to minimize exposure and PPE use.
We made a prospective plan to assess accuracy of the Libre on inpatients admitted to COVID units during an initial “validation phase”. Methods: Fingerstick blood glucose (FSBG) was checked for the first three days after placing the sensor and compared to Libre values within the next 1-15 minutes. Patients were instructed to scan the sensor after each FSBG, and at other times as clinically warranted. FSBG values were recorded from the medical record (CPRS) and compared to Libre values downloaded to LibreView. The mean absolute relative difference (MARD) between FSBG and Libre was calculated for each patient for one to three days. The average MARD across all patients was calculated. Accuracy was further assessed using the Bland-Altman Plot and error grid analysis using web-based tool. Results: Of the 21 patients assessed in the validation phase, 19 had at least one day of data and 11 had at least three days. The mean MARD was 11.2% after one day, and 12.5% after three days. Four patients after one day and three patients after three days had a MARD of 15-20% where use of the Libre was continued with confirmatory FSBG. In 15/19 (78%) patients with one day of data and 8/11 (73%) of patients with 3 days of data had a MARD <15% and continued using the Libre without further FSBG. One patient had a MARD >20% that did not improve with changing the sensor, and Libre was discontinued. In 16 of 19 patients, the Libre values were lower than FSBG. No adverse events relating to Libre use were identified. Error grid analysis showed that most patients had no values outside the A and B ranges, and very few values outside of the clinically accurate range, occurring in 2 of the 19 patients (9% of values in the “slight risk” zone in 9% in one and 6% in the other). Summary: The Libre was well-accepted by patient and nursing staff, but did not have measurable effect on glycemic control, hypoglycemic events, or hospitalization measures. The libre was deemed a useful intervention in inpatients, but it can be inaccurate or only moderately accurate compared to FSBG in enough patients to require checking accuracy for at least 1-3 days. Inaccurate Libre values were mostly lower than FSBG requiring confirmatory measures of low Libre values with FSBG in our experience.

12:12 – 12:18 pm
#115 – Bridging the gap in PrEP provider training: An implementation science study
Aditi Ramakrishnan, Sales JM, McCumber M, Psioda MA, Powell L, Sheth AN

Background: Training healthcare providers in various settings to deliver pre-exposure prophylaxis (PrEP) is a key component of the Ending the HIV Epidemic (EHE) initiative. Self-efficacy, the individual’s belief in their ability to carry out steps of PrEP delivery, is essential to provider training and successful PrEP implementation. We characterized self-efficacy among providers from non-PrEP family planning (FP) clinics to inform provider training strategies. Methods: We surveyed providers from FP clinics in 18 Southern states (Feb-June 2018, N=325 respondents) using self-efficacy questions (overall and grouped into PrEP delivery steps: screening, initiation, and follow-up). We compared self-efficacy scores (5-point Likert scale) by self-efficacy regarding insurance navigation with no significant difference by prescriber status. The mixed model demonstrated overall self-efficacy was positively associated with favorable PrEP attitudes among non-prescribers, PrEP knowledge among prescribers, and contraception self-efficacy in both groups. Insurance navigation on-site was not significant but remained in the model (Figure). Conclusion: FP providers reported low confidence in PrEP initiation. Provider training targeting this step is critical to improve PrEP implementation and EHE initiatives. Alternatively, programs employing referral or telehealth models to support PrEP initiation can successfully bridge this gap.
Acknowledgements

We would like to thank our poster judges, session moderators, and abstract reviewers for their contributions to this event.

Planning Committee Members
Viranuj Sueblinvong, MD, Faculty Chair
Cecile Lahiri, MD, Faculty Vice-Chair
Kathy Griendling, PhD
Charles Searles, MD

Special Thanks
We would like to thank the Strategic Advisory Research Team (StART), Amy Davis, Alia Kamel, Lauren Marshman, Sarah McClellan, and Katie Plaia for their help.

Tag your posts about today’s event:
#DOMResearchDay

This event is sponsored by:
The Department of Medicine’s Strategic Advisory Research Team (StART) and The Department of Medicine’s Office of Research

Find research resources, guidance, and events at
https://med.emory.edu/departments/medicine/research/index.html