DOXORUBICIN CARDIOTOXICITY IN HUMAN ORGANOTYPIC CARDIAC SLICES IS MODULATED BY P38 MAPK INHIBITION IN A SEX- AND ISOFORM-SPECIFIC MANNER

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Purpose of study Doxorubicin (DOX), an anthracycline used in anti-cancer therapy, has significant cardiotoxic effects that cause cardiomyopathies. Activation of stress signaling molecules, including p38 MAP kinase isozymes p38α, p38β, p38γ and p38δ, has been implicated in the development of cardiotoxic effects. We previously demonstrated that p38δ deletion provides cardioprotection during DOX treatment in female but not in male mice. We hypothesized that DOX cardiotoxicity can similarly be attenuated by p38 inhibition in an isoform- and sex-specific manner in human organotypic cardiac slices.

Methods used Slices (400 μm) were prepared from the left ventricle of human donor hearts that were not used in transplantation. Slices were cultured for 24 hours in the presence of DOX (0, 0.5, 1, 5, 10 and 50 μM) and 1) SB203580 (p38α/b inhibitor, 10 μM), 2) Compound62 (pan p38 inhibitor, 1 μM) or 3) p38 isoform-specific siRNA. Slices were optically mapped and conduction velocity (CV) was determined. Slices were fixed and RNAseq was performed.

Summary of Results CV was reduced with increasing DOX dose, with 62% male slices and 29% female slices viable at the highest DOX dose of 50 μM. However, at 5 μM DOX, CV was reduced by 22% in males (21.7 to 16.7 cm/s) and 5% in females (21.0 to 20.0 cm/s). RNAseq revealed 1652 differentially expressed genes (DEGs) in male versus female DOX-treated slices while only 71 DEGs were observed between male versus female control slices. SB203580 failed to prevent DOX-induced CV slowing in mice of both sexes (19% and 18% CV reduction in males and females, respectively). On the other hand, Compound62 + 5 mM DOX, preserved CV, preferentially in females (10% vs 3% CV reduction in males and females, respectively). Finally, preliminary data from p38δ isoform-specific siRNA-treated slices revealed preservation of CV in the presence of DOX only in slices with p38δ knockdown.

Conclusions These findings reveal sexual dimorphism in DOX-induced cardiotoxicity in human organotypic cardiac slices via a mechanism that involves differential sex-specific gene expression changes. Furthermore, DOX cardiotoxicity is mitigated by inhibition of specific p38 MAPK isoforms in a sex-specific manner.

2VALIDATION OF A MODIFIED RESPONSE EVALUATION CRITERIA IN SOLID TUMORS AFTER STEREOTACTIC ABLATIVE RADIOSURGERY FOR LUNG CANCER

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Purpose of study Stereotactic ablative radiosurgery (SABR) is an emerging modality of treatment for patients with lung neoplasms. The evaluation of response after treatment with ablative therapies is challenging due to a residual scar and post-treatment inflammation. Recently, the value and ideal timing of PET-CT imaging for grading response to ablative therapy have been debated. The objective of this study is to validate our previously described modified response evaluation in solid tumors (RECIST) criteria, which incorporate PET scans to evaluate response after ablative therapy.

Methods used We retrospectively reviewed outcomes of 35 patients with lung neoplasm treated with SABR which included only patients receiving pre-treatment and post-treatment (2-6 months following SABR) PET/CT scans. Responses were graded using our modified RECIST criteria: complete response (CR), partial response (PR), stable disease (SD), or progressive disease (PD). Patients were followed in the clinic and monitored for progression. We stratified the overall survival (OS) and progression free survival (PFS) based on response to treatment for patients with primary neoplasm and recurrent neoplasm. We performed landmark Kaplan Meier analysis for survival and recurrence, and times were offset by six months to correct for immortal time bias.

Summary of results Thirty-five patients (primary lung tumors n=14; recurrent lesions n=21; median age 71 years) were treated with a median dose of 48 Gy. Responses were graded as: 3 CR, 17 PR, 7 SD, and 8 PD. Modified PET/CT responses were dichotomized as CR/PR vs SD/PD. Among 14 patients treated for primary lung cancer, patients with CR/PR had equivalent OS (p = 0.90), but improved PFS by a median of 7 months (p = 0.02) (figure 1). Among 21 treated for recurrence, those with CR/PR had significantly improved OS vs. SD/PD, with a median improvement of 9 months (p = 0.02). Similarly, PFS was significantly better for CR/PR vs. SD/PD (p = 0.006), with a median improvement of 8 months.

Conclusions In this study, we demonstrate the potential validity of our modified RECIST criteria incorporating PET scans 2-6 months after SABR, as an early surrogate for response to treatment and progression and survival. Further studies examining other factors predictive of response to SABR may improve patient selection and treatment efficacy.
### 3 SAFER USE OF ASPIRIN IN OLDER ADULTS, NEED FOR A CONSENSUS

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**Purpose of study** Aspirin has been the mainstay of primary prevention of cardiovascular diseases (CVD) for decades. In 2019, the new guideline came as a ‘revolution’, backing off aspirin for primary cardiovascular prevention, recommending against the use of aspirin in those over age 70. We conducted a quality improvement project aiming to decrease the risk associated with aspirin use in older patients and inquire physicians’ opinion on the current guideline.

**Methods used** The study took place at a community hospital. We identified patients older than 70 through electronic medical records, who were prescribed aspirin within the months of April, May and June 2019. We reviewed each chart, identified CVD, CV risk factors (Hypertension, Diabetes, Hyperlipidemia), anemia, gastrointestinal bleed and Chronic Kidney Disease. Excluding patients on aspirin for secondary prevention, we shared the list of patients electronically with their respective geriatrician. Finally, we anonymously surveyed 3 geriatricians, 3 internal medicine (IM) physicians and 3 cardiologists.

**Summary of results** We found that 375 patients were prescribed aspirin and 159 of them were for primary prevention. The mean age was 80.63% had 3 CV risk factors, 25% anemia or GI bleed. Our survey revealed 67% of geriatricians, 67% of IM physicians, 100% of cardiologists were aware of the new guideline. 33% of geriatricians, 67% of IM physicians, 67% of cardiologists would feel comfortable discontinuing aspirin in patients with high CV risk factors. 67% of geriatricians, 67% of IM physicians, 100% of cardiologists agreed to first screen for symptoms of angina or PAD and wait to complete the work up if symptoms were present.

**Conclusions** Our study revealed that most physicians, while being aware of the new guideline, would be cautious discontinuing aspirin without screening for symptoms of angina or PAD. This reveals that clinicians facing new guidelines keep their clinical judgment to make the best decision for their patients. Our project would help highlighting patients at high risk of bleed and bring the providers attention to those cases. The limitation of our project is not including smoking as a risk factor, not identifying the etiology of anemia, and not capturing patients taking OTC aspirin. The next step of our project would be to organize a Geriatrics-IM-Cardiology conference for a consensus on aspirin use for primary prevention in our high risk population.

### 4 EFFICACY OF FACEMASKS IN PREVENTION OF COVID-19: A SYSTEMATIC REVIEW

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**Purpose of study** The efficacy of facemasks in prevention of disease transmission is widely debated with a paucity of underlying evidence. In the face of COVID-19, officials began considering potential benefits of facemask use, such as preventing transmission to others or protecting health care workers interacting with infected individuals. However, the efficacy of facemasks in the context of COVID-19 is not well studied and its impact on transmission has not yet been fully elucidated.

**Methods used** A systematic review was conducted in PubMed, Web of Science, Embase and Cochrane library from database inception up until August 2020 to analyze the efficacy of facemasks, regardless of type, on the prevention of SARS-CoV-2 transmission in both healthcare and communal settings. Only English language articles were retrieved, and conference proceedings were omitted. Results were reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) criteria.

**Summary of results** Of the 2720 articles that were identified, 27 studies were included based on predetermined criteria. Of these, ten had complete data. Of 1200 subjects, 953 (79.4%) reported wearing masks while 246 (20.5%) did not. Of the 228 (19.0%) who received a positive COVID test, 73 (32.0%) wore masks and 155 (68.0%) did not. Health care settings comprised 829 subjects, 692 (83.5%) reported wearing masks while 136 (16.4%) did not, and 114 (13.8%) received a positive COVID test. Of these, 50 (43.9%) wore masks and 64 (56.1%) did not. In 371 subjects in non-health care settings, 261 (70.4%) reported wearing masks while 110 (29.7%) did not. Of these, 114 (30.7%) received a positive COVID test, while 23 (20.2%) wore masks and 91 (79.8%) did not.

**Conclusions** Wearing a facemask was associated with lower COVID-19 rates in both healthcare settings and non-healthcare settings. From the current data, it appears that a lower percentage of healthcare workers tested positive for COVID-19 compared to subjects in non-healthcare settings, regardless of mask usage. Study limitations include limited data regarding the types of mask worn, level of exposure risk, and other personal protective measures taken.

### 5 PRACTICE PATTERNS OF RAPID INFLUENZA DIAGNOSTIC TEST

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**Purpose of study** Influenza is a common acute respiratory infection that causes significant morbidity and mortality worldwide (1). Empiric treatment may be initiated based on clinical suspicion alone or a positive laboratory test (2). While the rapid molecular assay is recommended, the rapid influenza diagnostic test (RIDT) continues to play an important role in clinical decision-making due to rapid resulting time, relative simplicity of use, and low cost (3). We aimed to survey pediatric urgent care provider practice surrounding RIDT.

**Methods used** A 25 questions survey regarding provider background and practice surrounding RIDT was created and distributed via email to members of the Society for Pediatric Urgent Care (SPUC). We sent a reminder 2 weeks after the initial recruitment. Respondents did not receive material incentive for their involvement.

**Summary of results** Of the 333 (17%) of recipients completing our survey. Many of these sites continue to use RIDT (figures 1, 2). During influenza season, clinicians report an overall higher confidence in their diagnosis of influenza with the aid of a positive RIDT, especially among those who...
practice in urban communities and urgent cares within a hospital or emergency department (ED) (figure 3). 15 of 56 respondents (27%) report higher likelihood of prescribing antiviral medications to patients >2 years of age without comorbidities if an RIDT is positive (figure 4).

Conclusions Among respondents of various training backgrounds and practice sites, more providers report higher confidence in diagnosing influenza based on a positive RIDT than clinical symptoms alone. The responses also show that in cases where the American Academy of Pediatrics does not provide specific guidelines for treatment with antivirals, RIDT results may influence the providers’ clinical decision making process.

Respondents come from different training backgrounds and communities, 29/56 respondents report using RIDT at their facilities. Providers in urban and hospital/ED facilities report higher confidence in influenza diagnosis based on RIDT than clinical symptoms. Across different communities and facilities, there are providers who report increased likelihood of prescribing antiviral medications if a positive RIDT supports their clinical diagnosis.

**EQUITY AND INCLUSION IN PATIENT CENTERED OUTCOMES RESEARCH: LESSONS FROM THE ADAPTABLE STUDY AT MONTEFIORE SITE**

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**Purpose of study** ADAPTABLE is the first pragmatic multicenter trial in US, conducted by Patient Centered Outcomes Research (PCOR) Network, comparing the effectiveness of two aspirin doses for secondary prevention of atherosclerotic cardiovascular disease. Novel features include patients’ representation as research partners, leveraging of electronic health records, participation via internet and low cost. Direct patient engagement can improve research impact and provide access to minority populations, often less represented in clinical research. We aim to analyze the recruitment and patient follow up data from Montefiore Hospital in Bronx, NY, serving a community of socioeconomically disadvantaged minorities.

**Methods used** A computable phenotype linked patient lists with clinic schedules, and invitations were sent by voice, text, and email to eligible patients prior to their appointments. Out of 6047 eligible patients, 85.8% were contacted about the study, 16.5% requested not to be contacted further and golden tickets numbers (GTN) were emitted for those willing to enroll. Patients were then enrolled online with the help of a

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**Abstract 5 Figure 1**

**Abstract 5 Figure 2**

**Abstract 5 Figure 3**

**Abstract 5 Figure 4**
A SOLUTION TO DECREASE POTENTIALLY INAPPROPRIATE MEDICATIONS (PIM) USE DURING HOSPITALIZATION

Purpose of study The use of PIM in older adults can lead to serious adverse events. The American Geriatrics Society BEERS criteria is an explicit list of PIM to be avoided, if possible, in older adults. Diphenhydramine from the class of anticholinergics may cause cognitive impairment and behavioral changes and yet it is still used as a sleeping aid. Our study aimed to understand why diphenhydramine was prescribed during hospitalization and highlight the importance of concerted strategies for educating patients about the value of participation and equal representation in clinical studies. These efforts are crucial for ensuring equity and inclusion in PCOR and reflect our commitment to our patients, our community and our future.

Methods used The study took place in a community hospital and in-clinic efforts helping them overcome the challenges to their inclusion. Combined local and national collaboration supported EOS completion. Similar mortality rates denoted equal level of care. These results represent authentic lessons to conducting PCOR among populations lacking access and knowledge about the internet and clinical research and highlight the importance of concerted strategies for educating patients about the value of participation and equal representation in clinical studies. These efforts are crucial for ensuring equity and inclusion in PCOR and reflect our commitment to our patients, our community and our future.

Summary of results Out of 516 patients randomized at Montefiore, representing 77.48% from the GTNs emitted, 87.5% were nonwhite. The non-internet enrollment after 2 years was 57.3% compared to the national non-internet rate of 17.4% (p<.01). That increased to 69% by the end of the study (EOS). The EOS completion at Montefiore was 61.82% compared with 78.98% nationally. At the end of the study we observed 5.8% vs. 4.1% withdrawals and a similar, slightly lower, percentage of deaths: 2.9% vs. 3.7% at Montefiore site vs. nationally. EOS data and characteristics associated with lower retention and lower mortality will be analyzed further.

Conclusions For Montefiore Site’s patients, recruitment depended on direct physician involvement and in-clinic efforts helping them overcome the challenges to their inclusion. Combined local and national collaboration supported EOS completion. Similar mortality rates denoted equal level of care. These results represent authentic lessons to conducting PCOR among populations lacking access and knowledge about the internet and clinical research and highlight the importance of concerted strategies for educating patients about the value of participation and equal representation in clinical studies. These efforts are crucial for ensuring equity and inclusion in PCOR and reflect our commitment to our patients, our community and our future.

8 PREDICTORS OF MISPERCEPTIONS, RISK PERCEPTIONS, AND PERSONAL RISK PERCEPTIONS ABOUT COVID-19 BY COUNTRY, EDUCATION AND INCOME

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Purpose of study Government interventions, such as mandating the use of masks and social distancing, play a crucial role in controlling the spread of disease during a pandemic. Currently, there is a disconnect between policy and public adherence. The Health Belief Model states health initiatives will be successful if they can target perceived barriers, benefits, self efficacy, and threats. Our goal was to explore the roles of education, income, and country on misperceptions, risk perceptions, and personal risk perceptions about COVID-19.

Methods used The data used in this study were supplied by Pennycook et, al. Data were extracted from three pre-registered surveys conducted by the polling firm Prolific. Binary logistic regressions were conducted to investigate the roles country, education, and income had on outcome variables.

Summary of results Across the United States (USA), Canada, and United Kingdom (UK), individuals in the highest income quartile were significantly less likely to hold misperceptions (OR=0.61) and less likely to perceive personal risk (OR=0.38) regarding COVID-19 compared to individuals in the lowest income quartile. When comparing these income quartiles in the USA, the difference in perceived risk was heightened (OR=0.21). Citizens of the UK were more likely to have risk perceptions compared to citizens of the USA (OR=1.50). Citizens of Canada were less likely to perceive personal risk compared to citizens of the USA (OR=0.40).

Conclusions Public health initiatives can induce maximal behavior change if they successfully target perceived barriers, benefits, self efficacy and threats. Proper risk perception and understanding of COVID-19 is necessary in order for the public to adhere to government initiatives. People of the lowest income quartiles were shown to have more...
misperceptions and personal risk perceptions across all three countries. This highlights the socioeconomic impact COVID-19 has on the global community. Our findings support past research on the importance of education and income in affecting health perceptions and outcomes. Further research is needed to explore interventions to minimize misperceptions, accurately shape risk perception, and effectively communicate science.

9 COGNITIVE FUNCTION AND THE CONSUMPTION OF PROBIOTIC FOODS IN OLDER ADULTS: AN NHANES STUDY

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Purpose of study Fermented foods such as yogurt contain multiple species of probiotic organisms, e.g. lactobacilli and bifidobacteria. Few studies have examined the link between probiotics consumption and cognitive function in older adults. We used data from the National Health and Nutrition Examination Survey (NHANES) 1999-2000 cohort to determine if there is a relationship between consumption of probiotic foods and cognitive function test performance in older adults.

Methods used Using R, NHANES consumption behavior data were merged with data on cognitive function, BMI and demographics for participants ≥60 years old. Data was sorted on whether respondents reported eating yogurt as part of a weekly dairy consumption question (yogurt/dairy). The outcome variable was the Wechsler Adult Intelligence Scale, Third Edition (WAIS III) Digit-Symbol Substitution Test (DSST). Higher scores indicate greater cognitive function. Linear regressions were used to quantify associations between variables of interest. Models were adjusted for age, sex, race, BMI, education level and poverty-to-income ratio.

Summary of results Weekly yogurt/dairy intake was positively associated with WAIS III scores in an unadjusted model (β=4.32, 95%CI 1.2 to 8.1, p=0.02; n=1,834). The full model of WAIS III scores regressed on yogurt/dairy consumption, age, gender, race/ethnicity, education, poverty-to-income ratio and BMI identified only age, education, and poverty-to-income ratio as significant covariates. After adjusting for significant covariates, weekly consumption of yogurt/dairy was positively associated with WAIS III scores (β=2.39, 95%CI 0.02 to 4.60, p=0.069; n=1,834). Those who reported weekly yogurt/dairy consumption trended towards higher WAIS III scores (mean=46.49, standard error=0.78) than those who did not (mean=41.84, standard error=1.80).

Conclusions This study identified a positive association between yogurt/dairy consumption and higher cognitive function scores in older adults after controlling for age, education and income level. The difference in the weighted average cognitive function score sorted by yogurt/dairy consumption (4.65 points), as measured by the DSST, is clinically relevant. Regular yogurt/dairy intake may be an important contributor to higher cognitive function in older adults. More direct evidence is needed to determine a causal relationship whereby yogurt/dairy consumption can help maintain healthy cognition in older adults.
Summary of results 360 patients successfully completed a telemedicine visit between April 2020 and September 2020 with an average visit show rate of 52%. Primary language was English in 89%. These patients were most frequently classified as having mild-persistent asthma and were assessed as well-controlled. Satisfaction survey response rate was 33%; overall average satisfaction was high. In the comparison group, 701 patients successfully completed an in-person clinic visit between April 2019 and September 2019 with a visit show rate of 39%. Primary language was English in 84%. These patients were most frequently classified as having mild-persistent asthma, not well-controlled. Healthcare utilization data for both groups six months prior to their visit are displayed (Table 1).

Conclusions The use of telemedicine provides IMPACT DC a feasible and adoptable model to continue caring for children with asthma, with overall high patient satisfaction. This model addresses access barriers during the pandemic, and promises to be an adjunctive tool for reaching families with low show rates and high healthcare utilization.

Abstract 11 Table 1

<table>
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<tr>
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<th>Telemetry Cohort</th>
<th>In-Person Clinic Cohort</th>
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<tbody>
<tr>
<td>Emergency Department visit(s)</td>
<td>56%</td>
<td>67%</td>
</tr>
<tr>
<td>Hospital admission(s)</td>
<td>15%</td>
<td>26%</td>
</tr>
<tr>
<td>Oral corticosteroid course(s)</td>
<td>49%</td>
<td>61%</td>
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Purpose of study The mitochondria function as the major regulators of energy metabolism and apoptosis in eukaryotic cells. It is hypothesized that a primary cause of apoptosis is the opening of the Mitochondrial Permeability Transition Pore (mPTP), a large, nonselective leak channel that depolarizes the inner mitochondrial membrane and causes mitochondrial matrix swelling, bursting of the outer membrane and the release of cytochrome c into the cytosol. Formation of the mPTP is a proposed mechanism of cell death in neurodegenerative diseases, stroke, and post-ischemic injury. The Jonas laboratory is working to elucidate the structure of the mPTP which is hypothesized to be composed of a ring of c-subunits within the FO subunit of ATP Synthase.

Methods used Patch clamp technique was used to probe the requirement for the c subunit in forming the mPTP. Mitochondria isolated from WT mouse embryonic stem cells and from cells depleted of ATP synthase c-subunit by CRISPR were tested for membrane permeability. Mitochondria were visualized using a Zeiss microscope; patch clamping was performed on mitochondria (mitoplasts) using high resistance borosilicate electrodes. Currents were filtered and acquired with an Axopatch 200B amplifier.

Summary of results We found that the peak conductance of the patches was lower in mitochondria (mitoplasts) depleted of the ATP synthase c-subunit compared to mitochondria of the WT mouse cells. These studies showed decreased average peak conductance in the mitochondria depleted of the c subunit.

Conclusions These data are consistent with the hypothesis that the c-subunit forms the largest non-selective conductance of the mitochondrial inner membrane. Based on this work, future studies could interrogate the regulation of the mPTP using reagents (small molecules or antibodies) that specifically activate or inhibit the ATP synthase c-subunit large, multiconductance channel.

Purpose of study A bioresorbable pacemaker implanted via bio-adhesive can deliver electrotherapy while also addressing issues such as bleeding complications, pathological tissue reaction, and re-operation for device removal. We aim to demonstrate the feasibility of a fully bioresorbable battery-free and bioadhesive system for temporary pacemaking (A-D).

Methods used Pacing capabilities of the device were confirmed by far-field ECG recordings and optical mapping of ex vivo mouse and human cardiac tissue. Long-term pacing was verified by implanting the device into rats using an electrically conductive bioresorbable hydrogel adhesive (n = 22) and monitored daily via ECG. Resorption of device was monitored by computed tomography (CT) over the course of 7 weeks. Assessment of biocompatibility was performed with serology tests, echocardiography, and Masson’s trichrome staining.

Summary of results In mouse hearts and human ventricular slices, ECG or optical action potential traces show ventricular activation synchronous with the delivered electrical stimuli (E-F, left). The membrane potential activation originates from the site of the electrode pad, which demonstrates that the device drives the activation of the heart (E-F, right). For chronic pacing, the bioresorbable pacemaker was implanted onto the epicardium via the bioadhesive (G) and achieved capture of the heart for 8 days (H). The pacemakers resorbed over the course of 7 weeks (I), and physiological serologies were maintained (J). The mechanical output of the heart was not impaired as evidenced by an unchanged ejection fraction following implantation (K). No significant increase in fibrosis was found in the myocardium near the site of pacemaker attachment (L). Overall, the implanted pacemaker and bioadhesive are highly biocompatible.

Conclusions This fully bioresorbable pacemaker and adhesive system is implantable and can acutely and chronically capture
the heart. This technology offers potential in future innovations for patients with short-term pacing requirements.

**Purpose of study** Obesity has been associated with attenuated vaccine responses and an increased risk of contracting pneumococcal pneumonia, but no study to our knowledge has assessed the impact of obesity and genetics on 23-valent pneumococcal vaccine (PPSV23) efficacy. We assessed the relationship of obesity and stimulator of interferon genes (STING1) genotype on PPSV23 efficacy.

**Methods used** Nonobese (BMI 22–25 kg/m²) and obese participants (BMI ≥30 kg/m²) were given a single dose of PPSV23. Blood was drawn immediately prior to and 4–6 weeks after vaccination. Serum samples were used to assess PPSV23-
specific antibodies. STING1 genotypes were identified using PCR on DNA extracted from peripheral blood samples.

**Summary of results** Forty-six participants were categorized as nonobese (n = 23; 56.5% women; mean BMI 23.3 kg/m2) or obese (n = 23; 65.2% women; mean BMI 36.3 kg/m2). Obese participants had an elevated fold change in vaccine-specific responses compared with nonobese participants (P < 0.0001). The WT STING1 group (R232/R232) had a significantly higher PPSV23 response than individuals with a single copy of HAQ-STING1 regardless of BMI (P = 0.0025). When WT was assessed alone, obese participants had a higher fold serotype-specific response compared with nonobese participants (P < 0.0001), but no difference was observed between obese and nonobese individuals with 1 HAQ allele (P = 0.693).

**Conclusions** These observations demonstrate a positive association between obesity and PPSV23 efficacy specifically in participants with the WT STING1 genotype. Sebastian M et al. Obesity and STING1 genotype associate with 23-valent pneumococcal vaccination efficacy. JCI Insight 2020;5(9). doi:10.1172/jci.insight.136141

**The Perceived Impact of the COVID-19 Pandemic on Medical Students’ Future Careers**

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**Purpose of study** The COVID-19 pandemic disrupted medical education on multiple levels, and medical students have been forced to adjust to distance learning, altered clinical opportunities, and standardized testing inconsistencies. We sought to identify the effects of these dramatic deviations on medical students’ career plans.

**Methods used** We conducted a cross-sectional online survey of Johns Hopkins medical students between 7/13/2020 and 9/9/2020 in order to assess the implications of the COVID-19 pandemic on students’ career decisions. The survey items were developed to cover topics ranging from physical and emotional well-being during the pandemic, as well as perceptions of the effects on career development. Respondents rated statements according to a 5-point Likert scale, with a score of 1 representing ‘strongly disagree’, 2 ‘somewhat disagree’, 3 ‘neutral’, 4 ‘somewhat agree’, and 5 ‘strongly agree’. Descriptive statistics were calculated for all variables.

**Summary of results** Of the 76 respondents, 61% strongly agreed that they view the field of medicine more positively since the onset of the COVID-19 pandemic (3.60 ± 1.09). Respondents somewhat agreed that they would be unable to explore other specialties and find their best fit (3.55 ± 1.32), but they felt neutral regarding level of competitiveness for their desired field (2.71 ± 1.08). We found that the majority (4/66, 6%) of students had considered changing their specialty. Students felt neutral in terms of their Step 1 (3.25 ± 1.03) or Step 2 (2.81 ± 1.02) score deterring them from future career opportunities.

**Conclusions** The majority of medical students have experienced barriers in their career pathway as a direct cause of COVID-19 restrictions on medical education, including the ability to explore different specialties to discover their best fit or find a chance to network with mentors. However, despite these obstacles, most students remain committed to medicine.

**Long-Term Prognostic Value of Left Ventricular Mass on Cardiac Magnetic Resonance Imaging in Anthracycline-Treated Cancer Survivors**

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10.1136/jim-2021-ERM.16

**Purpose of study** Cancer survivors treated with anthracycline-based chemotherapy are at risk for long-term adverse cardiovascular outcomes. Clinical and imaging risk factors for these outcomes are unknown. Left ventricular (LV) mass has been described in small studies to have prognostic relevance in cancer survivors, with lesser LV mass shown to be associated with worse outcomes. We aimed to determine the prognostic influence of LV mass on cardiovascular magnetic resonance imaging (CMR) on long-term adverse outcomes in a large cohort of cancer survivors treated with anthracycline-based chemotherapy.

**Methods used** Consecutive cancer survivors treated with anthracycline-based chemotherapy who underwent clinical CMRs for known or suspected anthracycline-related cardiomyopathy were studied. The primary endpoint was a composite of death or major adverse cardiac events (MACE): aborted cardiac arrest, heart transplantation, left ventricular assist device implantation, or heart failure hospitalization.

**Summary of results** Among 249 survivors who underwent CMR at a median of 2.9 years after cancer treatment, the median LV mass index was 51.6 (interquartile range 43.7, 59.9) g/m2. At a median follow-up time after the CMR of 2.7 years, 105 survivors experienced the composite endpoint of all-cause death or MACE. There were 89 deaths, 41 heart failure hospitalizations, 2 heart transplantations, 2 left ventricular assist device implantations, and 1 resuscitated asystolic cardiac arrest. On Kaplan-Meier analyses, there was a significant difference in the cumulative incidence of death or MACE when survivors were stratified by the median value of LV mass index (p=0.001), with a higher incidence in those with greater LV mass index. On Cox proportional hazards regression univariable analyses, LV mass index was associated with death or MACE [hazard ratio (HR) 1.34 per 1 standard deviation (SD); 12.1 g/m2 increase; 95% confidence interval (CI) 1.14–1.58; p=0.001]. However, on multivariable analyses, LVMI was not associated with death or MACE (HR 1.15 per 1 SD increase; 95% CI 0.96–1.38; p=0.13) after adjustment for age, type of cancer, time between anthracycline treatment and CMR, cumulative anthracycline dose, chest radiation...
therapy, trastuzumab, and heart failure diagnosed before the CMR.

**Conclusions** In anthracycline-treated cancer survivors undergoing CMR for suspected cardiotoxicity, LV mass was not independently associated with the long-term incidence of death or MACE.

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**Abstract 17**

**A SYSTEMATIC REVIEW OF RADIOFREQUENCY ABLATION FOR THE TREATMENT OF RECURRENT NSCLC**

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**Purpose of study** Despite advancements in lung cancer treatment, twenty-five to seventy percent of patients who undergo initial treatment for lung cancer have disease recurrence. Treatment for this group of patients is challenging, and results of reoperation for recurrence have not been encouraging, with a reported estimated 2-year survival of 23%. Radiofrequency Ablation (RFA), a relatively newer modality of treatment may be applicable in these patients. The purpose of this study is to synthesize the literature on the effectiveness of using RFA to treat recurrent non-small cell lung cancer (NSCLC) while identifying knowledge gaps in this subject.

**Methods used** Articles were obtained from Pubmed and Embase databases. Search terms ‘radiofrequency ablation and recurrent non-small cell lung cancer’, ‘radiofrequency ablation and recurrent lung tumor’ and ‘radiofrequency ablation and lung tumor’ were used. Studies involving patients who were treated with RFA after being previously treated for primary NSCLC tumors were included. Full text articles published from January 2000 - July 2020 with outcomes reported in at least five patients were included.

**Summary of results** An initial search yielded 4,585 titles and abstracts. About thirteen full text articles were suitable for an initial screening. Out of this search we found six relevant papers with a total of 226 patients diagnosed with recurrent NSCLC who received RFA treatment. All six studies were retrospective cohort studies. Table 1 provides a summary of these articles’ results.

**Conclusions** RFA is a viable option for recurrent NSCLC patients with acceptable one-year outcomes. Additional studies need to be done with a larger patient population and longer follow up times to fully evaluate the outcomes of RFA in recurrent NSCLC patients.

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**Abstract 18**

**MEASURING THE IMPACT OF AN EMPIRIC ANTIBIOTIC ALGORITHM FOR PULMONARY EXACERBATION IN CHILDREN AND YOUNG ADULTS WITH CYSTIC FIBROSIS**

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**Purpose of study** Pulmonary exacerbations (PEx) contribute to significant morbidity in persons with cystic fibrosis (CF), but there are not national consensus guidelines regarding optimal antibiotic treatment. We sought to decrease the unwarranted use of broad-spectrum antibiotics and assessed the impact of an empiric antibiotic algorithm using quality improvement (QI) methodology.

**Methods used** We assembled a multidisciplinary team of pulmonologists, infectious disease (ID) physicians, and pharmacists with expertise in CF. We assessed baseline antibiotic use for
PEx and developed an algorithm to guide antibiotic therapy based on microbiologic and antibiotic resistance history. We included persons with CF treated with IV antibiotics for PEx between Jan 2017 and Mar 2020. Our primary outcome measure was reducing unnecessary broad-spectrum antibiotic use as measured by use consistent with the algorithm. The intervention was the initiation of an empiric antibiotic algorithm. Secondary outcomes and process measures included documentation/justification for broad spectrum antibiotic use, the use of ID consult, hospital days, antibiotic days, and readmission in 30 days.

Summary of results 56 persons with CF had a total of 226 PEx events. The mean (±SD) age at first PEx was 12±6.7 years; 55% female, 80% white, and 29% Hispanic. After initiation of the algorithm, the rate of antibiotic use consistent with the algorithm increased from 46.2% to 79.5%. Documentation/justification for broad-spectrum antibiotics increased from 56% to 85%. Use of ID consults increased from 17% to 54%. There were no differences in hospital days, antibiotic days, or readmission in 30 days.

Conclusions Initiation of an empiric antibiotic algorithm led to an increase in the use of antibiotics per the algorithm, documentation/justification of broad-spectrum antibiotic use, and ID consult without an increase in treatment failure. QI initiatives can be beneficial in fostering positive working relationships between divisions and in standardizing care.

A TRAUMATIC PANDEMIC: HIGH ACUITY PEDIATRIC TRAUMA IN THE COVID-19 ERA

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Purpose of study COVID-19 has shifted the utilization of health care resources. Gaps remain in our understanding on how COVID-19 affects trends in pediatric trauma, the leading cause of mortality and morbidity during childhood and adolescence. We identified trends in the numbers and types of traumas presenting to a Level 1 Pediatric Trauma Center during the COVID-19 pandemic compared to prior years.

Methods used We compared high acuity trauma visits (defined as traumas requiring admission, emergent surgical intervention or resulting in a fatality) presenting between January 1st and August 31st, 2020 to corresponding months in 2017-2019. We also evaluated the changes in mechanisms of injury during this time period. Data were analyzed using longitudinal time series analyses and t-tests.

Summary of results Of 480 traumas presenting from January to August 2020, 227 (47.3%, 95%CI 42.7%-51.9%) were high acuity traumas. High acuity traumas declined significantly, as a state of emergency was declared, to a nadir of 16 in April 2020 (compared to the 2017-2019 mean of 38.3, p<0.001). As restrictions were lifted, high acuity traumas increased and surpassed previous years to a peak of 40 visits in August 2020 (2017-2019 mean 35.7, p<0.001). High acuity traumas as a proportion of total Emergency Department visits were higher from March to August 2020 compared to prior years (figure 1). There were more visits for high acuity assaults and child abuse but fewer for falls, drownings, and motor vehicle accidents from March to August 2020 compared to prior years, while visits for animal attacks remained stable (table 1).

Abstract 19 Table 1 High Acuity Traumas by Type, Number, and Significance

<table>
<thead>
<tr>
<th>Trauma Type</th>
<th>2017-2019 Mean</th>
<th>95% Confidence Interval</th>
<th>2020 Count</th>
<th>Percent change (%)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assaults</td>
<td>6.7</td>
<td>5.2–8.2</td>
<td>10</td>
<td>+49.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Motor Vehicle</td>
<td>77.3</td>
<td>76.3–78.3</td>
<td>63</td>
<td>−18.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Accidents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falls</td>
<td>68.7</td>
<td>66.7–70.7</td>
<td>51</td>
<td>−25.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Drowning</td>
<td>8.7</td>
<td>7.8–9.5</td>
<td>6</td>
<td>−31.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Child abuse</td>
<td>10.0</td>
<td>8.7–11.3</td>
<td>15</td>
<td>+50.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Animal Attack</td>
<td>5.7</td>
<td>4.1–7.2</td>
<td>5</td>
<td>−12.3</td>
<td>0.38</td>
</tr>
</tbody>
</table>
Conclusions This analysis provides insight into how the COVID-19 pandemic has affected high acuity trauma in an inner-city pediatric population. Findings may be used to guide public health measures on safety and injury prevention as the pandemic continues and further restrictions are debated.

Abstract 19 Figure 1  High acuity traumas as a proportion of all emergency department visits

**Purpose of study** Cystic fibrosis (CF), a life-limiting autosomal recessive disease, is characterized by recurrent pulmonary exacerbations (PEx) and lung function decline. PEx are usually caused by infections and treated with antibiotics. Antibiotic therapy has been shown to affect the lung microbiome of patients with CF. However, little is known about its cumulative long-term effect over time. The purpose of this study was to evaluate changes in the lung microbiome and lung function in CF patients over one-year following an initial pulmonary exacerbation (iPEx).

**Methods used** Twenty pediatric patients with CF had respiratory samples and spirometry obtained at quarterly visits and 1 year after iPEx. Visits were designated as Well (W), Sick (S), or Hospitalization (H). Shotgun sequencing was performed, and bacterial taxa were assigned using MetaPhlAn 2.0. Taxonomic count tables, imported into Rstudio v3.6.1, were analyzed using vegan v.2.5-6 and phyloseq v.1.28.0. Baseline lung function was considered the best spirometric parameter in the 12 months preceding iPEx.

**Summary of results** The mean (±SD) age of study participants at iPEx was 10.6±5.1 years; 55% male, 50% White, 20% Black, and 30% Hispanic. Thirty-five percent were homozygous and 55% heterozygous for F508del. There were 5.6±3.1 PEx visits; 76% were treated with oral antibiotics. The forced expiratory volume in the first second (FEV1) was below baseline in 55% of patients; 90% had returned baseline at 1 year. Sequencing was successful in 98/106 respiratory samples. Richness was not different at 1 year compared to iPEx (40.3 vs 39.3, p=0.9) but was significantly increased compared to end of antibiotic treatment (40.3 vs 23.8, p<0.001). Mean Shannon diversity index was significantly higher at 1 year compared to iPEx (2.8 vs 1.6, p<0.001) and after antibiotic treatment (2.8 vs 1.3, p<0.001), while the inverse Simpson index was significantly increased at 1 year compared to end of antibiotic treatment (5.1 vs 2.8, p<0.001).

**Conclusions** There was a significant increase in species richness and alpha diversity at 1 year compared to samples following antibiotic therapy for iPEx. Lung function significantly increased compared to iPEx, and most participants had return of lung function by 1 year. Whether longitudinal changes in microbial diversity are predictive of the future course is not known.

**Purpose of study** Endothelial adenosine monophosphate-activated protein kinase-alpha (AMPKα) deficiency potentiates hyperoxia-induced experimental bronchopulmonary dysplasia and pulmonary hypertension

**Methods used**

**Summary of results**

**Conclusions**
Purpose of study Bronchopulmonary dysplasia (BPD) is the most common chronic lung disease of preterm infants, with pulmonary hypertension (PH) being a common life-threatening sequela of the disease. Further, BPD-associated PH lacks curative therapies. We showed that hyperoxia increases lung AMPK activation in neonatal mice. Whether this alteration is a compensatory or contributory phenomenon in hyperoxia-induced experimental BPD is unclear. Thus, we hypothesized that endothelial AMPK-deficient neonatal mice would be more susceptible to hyperoxia-induced experimental BPD and PH than their wild-type littermates.

Methods used To determine the necessary role of endothelial AMPKα signaling in neonatal lung injury, we decreased endothelial AMPK expression by breeding AMPKα-1floxflox mice with Tie-Cre mice, and exposed endothelial AMPKα-1 sufficient or deficient mouse pups to air (21% FiO2) or hyperoxia (70% O2) from PND1 to PND14. Lung morphometric studies and echocardiographic (echo) studies were done on PND28 to determine the effects of AMPKα-1 gene and hyperoxia on alveolarization, pulmonary vascularization, pulmonary vascular remodeling, and PH. To determine the sufficient role of AMPK signaling in neonatal lung injury, C57BL6J wild-type mice were treated with daily i.p. injections of 1 mg/kg of the AMPK agonist, aminoimidazole-4-carboxamide ribonucleotide (AICAR), or the vehicle, while they were exposed to air or hyperoxia through PND1-PND14. Lung morphometric studies were done on PND14 to determine the effects of hyperoxia and AMPKα activation on alveolarization and pulmonary vascularization.

Summary of results Hyperoxia induced alveolar simplification, as evidenced by decreased radial alveolar counts and increased mean linear intercepts. Additionally, hyperoxia decreased lung angiogenesis. Further, hyperoxia induced pulmonary vascular remodeling and PH, as evidenced by increased medial wall thickness index of resistance lung vessels, decreased pulmonary acceleration time/ejection time ratio, and increased right ventricular systolic pressure. However, these effects of hyperoxia were augmented in the presence of endothelial AMPKα-1 deficiency. By contrast, AICAR-mediated AMPKα activation attenuated hyperoxia-induced lung injury.

Conclusions These findings support our hypothesis that AMPKα signaling mitigates hyperoxia-induced experimental BPD and PH in neonatal mice. We propose that AMPKα is a potential therapeutic target for BPD infants with PH.

Abstract 22 Figure 1 TNFRI & TNFRII concentrations (quartiles) at 3 months post-hospitalization and kidney disease progression over 4.5 years in the ASSESS-AKI cohort

Conclusions Plasma TNFRI/2 measured 3 months after discharge were independently associated with kidney disease progression, HF, and death; regardless of AKI status in the index admission. Evaluating TNFRI/2 may assist with risk stratification of patients in a timely manner prior to the development of long-term kidney and cardiovascular sequelae.
CONVALESCENT PLASMA TREATMENT OF SEVERE COVID-19 CASES IN THE BRONX, NY

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Abstract 22.5

Junior Physician Investigator Award Recipient

Purpose of study Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is the causative agent of the Coronavirus disease 2019 (COVID-19) pandemic. Convalescent plasma obtained from recovered persons was used for previous respiratory pandemics. Convalescent plasma with severe acute respiratory disease coronavirus 2 (SARS-CoV-2) antibodies (CCP) was proposed as an option that may hold promise as treatment for COVID-19. Our aim was to retrospectively evaluate the efficacy of CCP treatment of patients with severe to life-threatening COVID-19 hospitalized at Montefiore Medical Center (MMC) in the Bronx, NY between April 13 to May 4, 2020.

Methods used We administered CCP as part of the Mayo Clinic expanded access investigational new drug (IND) program for hospitalized patients. We compared the mortality and clinical outcome of 73 patients with COVID-19 who received 200 mL of CCP with a Spike protein IgG titer ≥1:2,430 (median 1:47,385) within 72 hours of admission to 1:1 propensity score-matched controls. Matching criteria for controls were age, sex, body mass index, race, ethnicity, comorbidities, week of admission, oxygen requirement, D-dimer, lymphocyte counts, corticosteroids, and anticoagulation use (figure 1). We...
additionally measured Spike protein IgG and neutralizing antibody titer in CCP and pre- and post-transfusion Spike protein IgG, IgM and IgA titer in CCP recipients. The primary outcome was all-cause mortality at day 28 post-CCP. The secondary outcomes were improvement in oxygenation status or mortality at day 28 post-CCP. Exploratory outcomes were associations between pre-CCP SARS-CoV-2 antibody titers and mortality at day 28.

**Summary of results** There was no difference in mortality or oxygenation between CCP recipients and controls at day 28. When stratified by age, compared to matched controls, CCP recipients < 65 years had 4-fold lower mortality and 4-fold lower deterioration in oxygenation or mortality at day 28 (figure 2, 3). There was no association between CCP IgG or neutralizing antibody titer and clinical outcome. For CCP recipients, pre-transfusion Spike protein IgG, IgM and IgA titers were associated with mortality at day 28 in univariate analyses but not in multivariable analyses. Pre-transfusion Spike protein IgG titer was significantly correlated with D-dimer and detected viral load measured by cycle threshold (Ct) value of nasopharyngeal SARS-CoV-2 reverse-transcriptase-polymerase-chain-reaction (figure 4). No adverse effects of CCP were observed.

**Conclusions** We report that CCP administration within 72 hours of hospitalization demonstrated a possible signal of reduced mortality in patients < 65 years. Pre-transfusion IgG titer may be a proxy for disease severity that may be useful in identifying those who are more likely to respond to CCP. Data from controlled trials is needed to validate this finding and establish the effect of ageing on CCP efficacy.

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**Abstract 22.5 Figure 3** Day 28 outcomes for CCP recipients (n=73) vs matched controls (n=73) presented by odds ratio and 95% confidence intervals using a logistic regression model. A. All age groups (n = 73 cases vs 73 controls). B. Age < 65 Years (n = 34 vs 34). C. Age ≥ 65 years (n = 39 vs 39). CCP, COVID-19 convalescent plasma; CI, confidence interval; OR, odds ratio.

**Abstract 22.5 Figure 4** SARS-CoV-2 spike protein IgG titers determined by ELISA at baseline (Day -1 or D-1) and 1, 3 and 7 day after transfusion (D1, D3 and D7) in CCP recipients. (A) Age <65 years. (B) Age ≥ 65 years. (C) Alive at day 28. (D) Died by day 28. (E) Not intubated on day of transfusion. (F) Intubated on day of transfusion. Correlation between baseline spike protein IgG titer and (G) D-dimer and (H) cycle threshold (Ct) value from intial nasopharyngeal SARS-CoV-2 RT-PCR in CCP recipients. The median titers and interquartile ranges are shown on the y-axis for each time point shown on the x-axis (A-F). X-axis shows days relative to convalescent plasma transfusion (A-F). Open circles show patients who died by day (G, H). r: Spearman’s correlation coefficient. Ct value, cycle threshold value.
Purpose of study A 32-years old male with known multi-system sarcoidosis in remission for 5 years off treatment presented to the emergency room with complaints of generalized weakness, hematemesis, epistaxis, and bruises. Physical examination was notable for petechiae, ecchymosis along with papules and plaques suggestive of active sarcoid skin lesions on his extremities. Laboratory workup was significant for thrombocytopenia 3000/μL, acute kidney injury with sub-nephrotic proteinuria. Peripheral blood smear did not show evidence of hemolysis and direct Coombs test was negative. Infectious workup including COVID-19, HIV, and hepatitis serologies were negative. Computed Tomography (CT) of chest, abdomen, and pelvis showed mild splenomegaly and an increased number of sub-centimeter hilar and mediastinal lymph nodes. The patient was treated with dexamethasone 40 mg daily for 4 days and intravenous immunoglobulins (IVIG-2 gm/kg) for possible Immune Thrombocytopenic Purpura (ITP) with improvement in platelet count to 42000/μL by day 3. His workup for AKI and sub-nephrotic proteinuria was negative apart from a positive ANA (1: 160) with low complements. The anti-phospholipid antibody panel was negative. The ACE level was markedly elevated (>80U/L). The patient could not get a renal biopsy due to severe thrombocytopenia. He was discharged but was re-admitted in 15 days for severe thrombocytopenia of 1000/μL, epistaxis, and bruising. We continued high dose steroids along with IVIG 1 gm/kg for refractory ITP with minimal response and started anti-CD20 agent (Rituximab) 375 mg/m2 weekly with thrombopoietin-receptor agonist (Eltrombopag). His platelets count improved in response to treatment and subsequent renal biopsy showed focal and segmental glomerulosclerosis along with mild interstitial fibrosis, tubular atrophy thought to be from long standing sarcoidosis. There was also evidence of focal arteriosclerosis with no evidence of granulomas, immune complex, complement, or IgG4 deposition. Given skin lesions, thrombocytopenia, extensive lymphadenopathy, and renal involvement with markedly elevated ACE levels the overall picture was consistent with active multi-system sarcoidosis. His platelet count increased to 177,000/μL at the time of discharge. Currently, the patient is on slow steroid taper along with Eltrombopag 25 mg every other day without any recurrence of his symptoms so far.

Methods used We described one case of sarcoidosis with hematologic and renal involvement.

Summary of results Our patient developed hematologic and renal complications approximately 6 years after being diagnosed with sarcoidosis. Initially, he did not demonstrate sufficient clinical response to IVIG and high dose steroids. However, after a course of anti-CD20 agent (Rituximab) and with the addition of thrombopoietin-receptor agonist (Eltrombopag) he showed improvement of platelet count and stabilisation of the renal function. Currently, the patient is receiving maintenance therapy with Prednisone 7.5 mg daily along with Eltrombopag 25 mg twice weekly with no recurrence of ITP.

and stable renal function. A further decision on whether the patient needs another cycle of Rituximab will be determined by the patient’s clinical course.

Conclusions Highly variable manifestations of Sarcoidosis can pose a significant diagnostic and therapeutic challenge as can be seen from our case. ITP is a rare hematological manifestation of sarcoidosis and addition of anti-CD20 agents should be considered in refractory cases.
Abstracts

ANTI-NMDA RECEPTOR ENCEPHALITIS MASQUERADING AS A SEIZURE DISORDER

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Purpose of study Anti-NMDA receptor (NMDAR) encephalitis is an autoimmune disorder with a variety of neuropsychiatric symptoms including decreased consciousness, delusional thinking, hallucinations, seizures, speech disturbances, movement disorder, autonomic dysfunction and central hypoventilation. The wide range of symptoms often leads to a diagnostic challenge. We report a case of anti-NMDA receptor encephalitis that was initially misdiagnosed as a seizure disorder. A previously healthy 35-yo male presented with behavioral changes, and 3 episodes of generalized stiffness in the last month lasting for 2-3 minutes without convulsions, tongue biting and bladder/bowel incontinence. Confusion, inability to recognize family members, anorexia and insomnia were reported for one month. Vitals signs were significant for tachycardia of 114 bpm. Physical exam was unrevealing, except disorientation. Initial baseline labs, urine toxicology, microbiology were unremarkable. The MRI brain and EEG were normal. During hospitalization, the patient became less responsive. Urinary retention and resistance to passive movement of the extremities were noted. CSF analysis showed protein 77 mg/dL, glucose 55 mg/dL and 140 WBCs/HPF with 96% lymphocytes. Empirical antiviral and antibacterial treatment failed to show improvement. The patient also developed episodes of diaphoresis, facial flushing and tachycardia. He was intubated for airway protection on day 9 of hospitalization and was started empirically on solumedrol 1 gram daily for 5 days and Intravenous immunoglobulin 2 g/kg for 4 days under the impression of NMDAR encephalitis. NMDAR antibody titers in CSF and serum came back 1:160 and 1:20 respectively. Further imaging ruled out any occult malignancy. Patient’s mental status did not show any meaningful improvements in 5 days. On day 15, Rituximab 375mg/m2 weekly was started, and solumedrol was down titrated to 40mg every 8 hours. Patient was transferred to an outside neuro-critical care unit for further treatment. He recovered from the acute phase and is now receiving rehabilitation therapy at home.

Methods used

Summary of results Before the discovery of NMDAR antibodies in 2007, many patients were misdiagnosed as psychiatric illness. The natural course of the disease progresses through the prodromal phase, psychotic phase, unresponsive phase and hyperkinetic phase. Majority of the patients with NMDAR encephalitis present at psychotic stage and upto 40% of them are still misdiagnosed as psychiatric illness. Recurrent seizures is another common manifestation in 80% of the patients. The presence of both psychotic symptoms and seizure-like activity should prompt the suspicion of autoimmune encephalitis syndromes. Anti-NMDA receptor encephalitis is frequently associated with underlying tumors and often referred to as paraneoplastic encephalitis. Diagnostic work up should rule out tumors especially testicular and ovarian tumors. The primary treatment is either immunotherapy or removal of tumor whenever possible. Multiple poor prognostic factors such as severe symptoms on presentation, delayed diagnosis and treatment, lack of improvement, high serum and CSF titers, GCS level 8 or less, changes in mental status, intubation to protect the airway and prolonged hospitalization and its related complications increase the morbidity and mortality of the condition.

Conclusions A high index of suspicion for anti-NMDA receptor encephalitis in the presence of seizure and psychotic features is warranted, as earlier diagnosis and treatment is associated with better outcomes and decreased morbidity and mortality.
Purpose of study We report a case of a 50-year-old male emigrated from Guyana and previously worked in agriculture, with a past medical history epididymitis, and Mycobacterium tuberculosis (MTB) infection who presented with recurrent episodes of hematuria, urinary frequency and urgency over the past 3 years and 10lb unintentional weight loss. Physical exam was unremarkable. Labs were significant for BUN 97 Cr 7.70, HIV negative, Positive Quantiferon TB. Urinalysis showed proteinuria (100 mg/dL), large leukocyte esterase, >50 WBC, no bacteria. Initial CXR (figure 1) and CT Chest (figure 2) showed findings consistent with prior MTB. CT Abdomen/Pelvis without contrast (figure 3) showed non-obstructed 2.3 mm calculus at the left ureterovesical junction, and thickening of the left ureter, left renal collecting system, and urinary bladder wall along with cystic structures resulting in renal parenchymal thinning bilaterally. Patient underwent cystoscopy, left retrograde pyelogram, and left ureteroscopy with stone removal, and white material was coating the left renal pelvis, left ureter, and urinary bladder wall. Biopsy and AFB culture of the bladder was positive for MTB and patient was started on Rifampin, Isoniazid, Pyrazinamide, and Ethambutal (RIPE) therapy.

Methods used Literature review.

Summary of results Urogenital tuberculosis (UGTB) is the second most common form of extrapulmonary tuberculosis after lymph node involvement. Mycobacterium Tuberculosis (MTB) reaches the genitourinary tract through hematogenous spread to the kidneys and accessory organs followed by descension into the ureters, bladder and urethra. Over time, bladder wall thickening may lead to vesicoureteral reflux, ureterohydronephrosis and ultimately obstructive uropathy resulting in end stage renal disease. Due to this insidious pattern of spread within the genitourinary tract, disease burden is typically advanced at initial presentation, as seen in our patient. Clinical presentation is similar to a urinary tract infection; urinary frequency, nocturia, urgency (50%), hematuria (35.6%), and flank or low back pain (34%), thus many are treated with antibiotics without clinical response. Abnormal urinalysis is seen in 90% of patients, most commonly sterile pyuria. Isolation of MTB in urine is the diagnostic gold standard however, a minimum of three early morning urine cultures are typically required to isolate MTB. Imaging findings of simultaneous kidney and bladder lesions, infundibular stenosis with subsequent dilation of renal calyces are highly suggestive. Treatment includes RIPE therapy for a minimum of four months. Surgery may be considered in patients with intractable pain, non-functioning kidney, serious or persistent
hematuria, and/or persistent non-MTB infection from obstruction. Complications include infertility, renal failure, and abscess or fistula formation.

Conclusions Due to its insidious, progressive, and destructive nature, Urogenital Tuberculosis must be considered in the differential diagnosis of patients presenting with sterile pyuria, recurrent urinary tract infections, and hematuria since early diagnosis and treatment may prevent permanent complications of a treatable, communicable disease.

Bilateral Upper lobe opacities and nodular densities, Bilateral Fibrotic Changes and calcified granulomas, Non-obstructed 2.3 mm Calculus at left uretovesical junction, thickening of left ureter, left renal collectig system and urinary bladder wall.

Purpose of study Since mid-April 2020 in Europe and North America, clusters of pediatric cases with a newly described severe systemic inflammatory response with shock have appeared. Patients had persistent fevers >38.5 C, hypotension, features of myocardial dysfunction, coagulopathy, gastrointestinal symptoms, rash, and elevated inflammatory markers without other causes of infection. The World Health Organization, Centers for Disease Control, and Royal College of Paediatrics associated these symptoms with SARS-CoV-2 as multisystem inflammatory syndrome in children (MIS-C). Cardiac manifestations include coronary artery aneurysms, left ventricular systolic dysfunction evidenced by elevation of troponin-T (TnT) and pro-B-type natriuretic peptide (proBNP), and electrocardiogram (ECG) abnormalities. We report the clinical course of three children with MIS-C while focusing on the unique atrioventricular (AV) conduction abnormalities. Case #1: 19-year-old previously healthy Hispanic male presented with abdominal pain, fever, and non-bloody diarrhea for three days. He was febrile and hypotensive (80/47 mmHg) requiring fluid resuscitation. Symptoms, lab findings, and a positive COVID-19 antibody test were consistent with MIS-C. Methylprednisolone, intravenous immunoglobulin (IVIG), and enoxaparin were started. He required epinephrine for shock and high flow nasal cannula for respiratory distress. Initial echocardiogram demonstrated a left ventricular ejection fraction (LVEF) of 40% with normal appearing coronaries. Troponin and proBNP were 0.41 ng/mL and proBNP 15,301 pg/mL respectively. ECG showed an incomplete right bundle branch block. He eventually became bradycardic to the 30s-50s and cardiac tracing revealed a complete AV block (figure 1a). Isoproterenol, a β1 receptor agonist, supported the severe bradycardia until the patient progressed to a type 2 second degree AV block (figure 1b). A second dose of IVIG was administered improving the rhythm to a type 1 second degree AV block. An IL-6 inhibitor, tocilizumab was given as the rhythm would not improve, and the patient soon converted to a first-degree AV block. Cardiac magnetic resonance imaging showed septal predominant left ventricular hypertrophy and subepicardial enhancement along the basal inferior/anteroseptal walls typical for myocarditis. Case #2: 9-year-old previously healthy Hispanic male presented after three days of daily fevers, headaches, myalgias, diffuse abdominal pain, and ageusia. He was febrile, tachycardic, and hypotensive (68/39 mmHg). Hypotension of 50s/20s mmHg required 3 normal saline boluses of 20 ml/kg and initiation of an epinephrine drip. Severe hypoxia required endotracheal intubation. After the MIS-C diagnosis was made, he was treated with IVIG, methylprednisolone, enoxaparin, aspirin, and ceftriaxone. Due to elevated inflammatory markers by day 4 and patient’s illness severity, a 7-day course of anakinra was initiated. Initial echocardiogram showed mild tricuspid and mitral regurgitation with a LVEF of 35–40%. Despite anti-inflammatory therapy, troponin and proBNP were 0.33 ng/mL and BNP of 25,335 pg/mL. A second echocardiogram confirmed poor function so milrinone was started. Only, after two doses of anakinra, LVEF soon normalized. Despite that, he progressively became bradycardic to the 50s. QTc was prolonged to 545 ms and worsened to a max of 592 ms. The aforementioned therapies were continued, and the bradycardia and QTc improved to 405 ms. Patient #3: 9-year-old African American male presented with...
four days of right sided abdominal pain, constipation, and non-bilious non-bloody emesis. He had a negative COVID test and unremarkable ultrasound of the appendix days prior. His history, elevated inflammatory markers, and positive COVID-19 antibody were indicative of MIS-C. He was started on the appropriate medication regimen. Initial ECG showed sinus rhythm with normal intervals and echocardiogram was unremarkable. Repeat imaging by day three showed a decreased LVEF of 50%. ECG had since changed to a right bundle branch block. Anakinra was started and steroid dosing was increased. By day 5, he became bradycardic to the 50s and progressed to a junctional cardiac rhythm. Cardiac function normalized by day 7, and anakinra was subsequently stopped. Thereafter, heart rates ranged from 38-48 bpm requiring transfer to the pediatric cardiac intensive care unit for better monitoring and potential isoproterenol infusion. He remained well perfused, with continued medical management, heart rates improved.

Methods used: Retrospective Chart Review.

Summary of results: Non-specific T-wave, ST segment changes, and premature atrial or ventricular beats are the most often noted ECG anomalies. All patients initially had normal ECGs but developed bradycardia followed by either PR prolongation or QTc elongation. Two had mild LVEF dysfunction prior to developing third degree heart block and/or a junctional escape rhythm; one had moderate LVEF dysfunction that normalized before developing a prolonged QTc. Inflammatory and cardiac markers along with coagulation factors were the highest early in disease course, peak BNP occurred at approximately hospital day 3-4, and patient’s typically had their lowest LVEF at day 5-6. Initial ECGs were benign with PR intervals below 200 milliseconds (ms). Collectively the length of time from initial symptom presentation till when ECG abnormalities began tended to be at day 8-9. Patients similarly developed increased QTc intervals later in the hospitalization. When comparing with the CRP and BNP trends, it appeared that the ECG changes (including PR and QTc elongation) occurred after the initial hyperinflammatory response.

Conclusions: Although the mechanism for COVID-19 induced heart block continues to be studied, it is suspected to be secondary to inflammation and edema of the conduction tissue. Insufficiency of the coronary arterial supply to the AV node and rest of the conduction system also seems to play a role. Although our patients had normal ECG findings, two developed bundle branch blocks prior to more complex rhythms near the peak of inflammatory marker values. Based on the premise that MIS-C is a hyperinflammatory response likely affecting conduction tissue, our group was treated with different regimens of IVIG, steroids, anakinra, and/or tocilizumab. Anakinra, being an IL-1 inhibitor, has been reported to dampen inflammation in viral myocarditis and tocilizumab has improved LVEF in rheumatoid arthritis patients. Based on our small case series, patient’s with MIS-C can have AV nodal conduction abnormalities. The usual cocktail of IVIG and steroids helps; however, when there are more serious cases of cardiac inflammation, adjuvant immunosuppressants like anakinra and tocilizumab can be beneficial.
have a colonoscopy, 36% of interested patients reported it wasn’t offered. 49% of surveyed patients weren’t interested in having a colonoscopy and when asked why, the most common response was that it didn’t seem necessary (22%). 67% of patients who declined colonoscopy were interested in the FOBT alternative. 60% of patients who declined both colonoscopy/FOBT stated they simply had no interest at all in CRCs. 20 healthcare staff were surveyed. When asked what colonoscopy appointment instructions are given to patients at its referral time, 60% of providers said to call GI, 43% and 100% of nursing and clerical staff respectively stated to go to GI department. The providers, nursing and clerical staff believe that while the main barriers to CRCs was lack of information/understanding about the importance of screening (50%, 71%, 100%, respectively), fear of the procedure as stated by 43% of nursing staff, and difficulty in obtaining a colonoscopy appointment (40% of providers and 67% of clerical staff respectively) were also contributing factors. 

Conclusions 
Our study revealed knowledge-based, provider-centric, and logistical barriers to CRCs. Allocating more time during a wellness visit for sharing materials on the importance of CRCs and changing the colonoscopy scheduling workflow to have the scheduler contact patients instead may help overcome those barriers. The next step of our project will be to measure the impact of our suggested interventions on the CRCs rate on our ACO patients.

Further investigations with adequate measures of treatment adherence are needed to better define the impact of cART in HIVAN and HIVICK.

# IMPACT OF FAMILIAL CONTACT ON THE QUALITY OF LIFE OF PATIENTS WITH MENTAL ILLNESSES

**Purpose of study**
Family is considered to be the primary social support network and one of the most important influences in a person’s life. People with serious mental disorders often live with their primary family members or have some ongoing contact with their family. Although people with mental illnesses may report family interactions to be less satisfying than interactions with other social networks, they are still likely to seek help from relatives during difficult times. Family members serve a substantial role in the recovery and management of these individuals, from early recognition of behavioral changes to aiding and encouraging a person to seek mental health services. The primary objective of this study aimed to determine whether the frequency of primary family contact had a direct relationship with the quality of life in patients with mental disorders. The Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q-SF) was used in conjunction with the Family Contact Time (FCT) in an outpatient psychiatric setting. We hypothesized that patients with a history of mental disorders who have increased FCT amongst primary family members would show higher QOL scores. Being that the mother-infant bond is the most permeating social bond in all mammals, we anticipated contact with the mother to be the most significant familial impact on QOL of patients with mental illnesses.

**Methods used**
84 participants, 35 which were male, all over the age of 18, who had a primary diagnosis of generalized anxiety disorder, major depressive disorder, bipolar disorder, schizophrenia, or schizoaffective disorder took a self-administered two-instrument (Q-LES-Q-SF, FCT) survey. The Q-LES-Q-SF is a 16-item questionnaire, scaled from 1 (very poor) to 5 (very good), designed to obtain measures of the degree of patient satisfaction and enjoyment in daily functioning. Incomplete Q-LES-Q-SF surveys were omitted from the analysis. The FCT is a 5-item questionnaire, scaled from daily/once a week/once a month/once every 6 months/yearly/never on social interactions with spouse/partner, mother, father, sibling(s), children over the past year. To clarify if empty responses on FCT indicated deceased/not applicable from never, the administrator of the scale would review the answers with the patient to ensure the accuracy of their response.

**Summary of results**
Results showed an r² value of 30%, representing no clear indication that the variation in total QOL scores was attributable to FCT. The analysis was refined with two parameters: a threshold for total QOL percent set to 65% (a value above the mean, 59%) while comparing only the extremes of FCT, never vs daily, for each primary family member. Results showed a direct relationship for QOL with ongoing contact with their family. Although people with mental illnesses may report family interactions to be less satisfying than interactions with other social networks, they are still likely to seek help from relatives during difficult times. Family members serve a substantial role in the recovery and management of these individuals, from early recognition of behavioral changes to aiding and encouraging a person to seek mental health services. The primary objective of this study aimed to determine whether the frequency of primary family contact had a direct relationship with the quality of life in patients with mental disorders. The Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q-SF) was used in conjunction with the Family Contact Time (FCT) in an outpatient psychiatric setting. We hypothesized that patients with a history of mental disorders who have increased FCT amongst primary family members would show higher QOL scores. Being that the mother-infant bond is the most permeating social bond in all mammals, we anticipated contact with the mother to be the most significant familial impact on QOL of patients with mental illnesses.

**Conclusions**
CART appeared to reduce the risk of progression to ESRD or death in patients with both HIVAN and HIVICK.
participants who stated daily interaction (n=28) had QOL >65% 58% more participants who stated no interaction (n=6) had QOL <65% Spouse/Partner: 30% more participants who stated daily interaction (n=13) had QOL >65% 25% more participants who stated no interaction (n=23) had QOL <65%.

Conclusions Despite the small size of the studied population, a trend was shown revealing a direct relationship between QOL and FCT with one’s father, children, and spouse/partner. QOL with mother had an inverse relationship with participants who stated no interaction, possibly due to impaired mother-infant bonding. Further direction includes increasing the sample size as this may be the correction needed to show a direct relationship for the mother.

Purpose of study For many years hypotonic intravenous fluid (IVF) has been the standard of care for hospitalized patients. However, the use of isotonic fluid reduces the risk of hypotension in children aged 28 days and older. All children on maintenance IVF are at risk for volume overload and associated complications. The goals of this project are to 1) increase the rate of isotonic fluids used in pediatric patients to > 80% and 2) decrease the proportion of time spent on IVF by 10% from baseline.

Methods used This project was part of a national quality improvement collaborative led by the American Academy of Pediatrics’ (AAP) Value in Inpatient Pediatrics network. The use of isotonic IVF at our institution both prior to and after the release of AAP IVF guidelines in December 2018 was assessed using chart review and monthly data tracking on run charts. In January 2020, multiple interventions were implemented including 1) a maintenance IVF pathway for providers to use in selecting tonicity of fluids 2) order set changes to make isotonic fluids the most readily available IVF choice and 3) note template changes requiring rationale for continuation of IVF.

Summary of results The rate of isotonic fluid use in pediatric patients at our institution was above the national goal rate (80%) during 75% of the pre-intervention period. During the post-intervention period, the rate of isotonic fluid use was sustained above goal rate (80%) for 100% of the post-intervention period. Additionally, on Days 2-4 of hospital admission, the proportion of time spent on IVF was 61% during the pre-intervention period and 62% during the post-intervention period.

Conclusions In conclusion, the rate of isotonic fluid use was already above goal during the majority of the pre-intervention period. Implementation of a clinical pathway, order set optimization and physician documentation for the rationale of continuation of IVF was associated with meeting national goals for isotonic IVF use in pediatric inpatients. However, these interventions did not significantly change the proportion of time spent on IVF during Days 2-4 of hospitalization. Further investigation on the appropriateness of IVF during Days 2-4 will be targets for future efforts.
HOSPITAL IN CRISIS: THE STORY OF MASS COMMUNICATION EFFORTS DURING THE COVID-19 PANDEMIC

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Purpose of study The COVID-19 pandemic led to an unprecedented rapid transmission of healthcare information. This information was critical to enact frequently changing patient care protocols and to inform staff about redistribution of hospital resources at New York University Langone Hospital—Long Island. In this investigation, we analyze our hospital clinicians’ methods of mass communication to front-line health care workers, with particular interest in assessing how communication was informed by real-time clinical findings. At the height of the pandemic (March 25th- April 15th), a mass broadcast email disseminated daily from the Director of Pulmonary and Critical Care was effective in informing treatment protocols that were clinically observed to improve patient outcomes. We analyzed over thirty broadcast emails and identified three major categories of information that were routinely addressed and/or updated: (i) reallocation of resources, (ii) clinical protocol changes, (iii) recommended lab tests for monitoring patient clinical course. We also interviewed key hospital clinicians and administrators on their experience working during the height of the pandemic. We found treatment protocols in these emails included information regarding the use of steroids and monoclonal antibody therapy, ventilators, and patient repositioning. In addition, the hospital’s first autopsy results on COVID related deaths gave further insight into the disease process and manner of death for many patients (diffuse alveolar damage and evidence of hypercoagulability). So, too, did clinical findings around this time support what was seen grossly on autopsy—patients with more severe disease often presented with serial d-dimer levels >6x the normal limit. The information through these different conduits was synthesized and subsequently communicated in the aforementioned mass emails as an anticoagulation treatment protocol. Through continuous input of data, this protocol was updated and adjusted over the course of three weeks. We found that real-time communication amongst hospital staff regarding patient treatment protocols was a dynamic process that required synthesis of lab values, autopsy findings, and observed response to treatments. Successful treatment of patients depended on continuous review and communication of this information.

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Conclusions We found that real-time communication amongst hospital staff regarding patient treatment protocols was a dynamic process that required synthesis of lab values, autopsy findings, and observed response to treatments. Successful treatment of patients depended on continuous review and communication of this information.
CASE REPORT: COMMUNITY ACQUIRED METHICILLIN RESISTANT STAPHYLOCCUS AUREUS HEPATIC LIVER ABSCESS

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Case report A methicillin resistant Staphylococcus aureus (MRSA) liver abscess is a rare infection that if not recognized and treated early can be fatal. There is limited literature demonstrating possible etiologies of MRSA liver abscesses, whether nosocomial or community acquired. We present a 45-year-old Guyanese male with a 30 pack-year smoking history. The patient presented with both generalized abdominal pain and a productive cough on two separate occasions. Laboratory results on his second presentation revealed leukocytosis and an increased ALT. Imaging revealed a multiloculated abscess in the inferior aspect of the liver, measuring 5.1 cm x 3.4 cm x 4 cm, and chest x-ray (CXR) revealed developing consolidation within the right perihilar region. The patient underwent percutaneous liver drainage via pigtail catheter. Fluid cultures grew methicillin resistant Staphylococcus Aureus. The patient was placed on vancomycin for a period of 3 weeks. Symptoms resolved without recurrence. Pyogenic liver abscesses have an incidence of 0.5-0.8%, with only 10% of these abscesses being caused by Staph aureus, and even fewer being caused by MRSA. Clinically, patients will present with symptoms such as RUQ pain, fever, chills, vomiting, and nausea.
Laboratory diagnosis will primarily consist of decreased albumin, increased white blood cell counts, alkaline phosphatase, aspartate aminotransferase, and bilirubin levels. Several imaging modalities such as abdominal x-ray and CT scan may be used to provide further insight into the condition. First line therapy for MRSA infection is intravenous vancomycin. Therapeutic intervention includes percutaneous drainage with the administration of empiric antibiotics. If the liver abscess is not treated with antibiotics aggressively for 2 to 3 weeks parenterally, followed by 2-4 weeks orally along with a percutaneous drain, then prognosis may be fatal due to sepsis, peritonitis, or empyema. A high suspicion for liver abscess should exist in patients that present with complaints of abdominal pain and elevated liver function tests when a previous source of infection was observed. MRSA liver abscesses are rare and potentially fatal; therefore, early recognition and appropriate management is essential.

**Purpose of study** Iliofemoral deep vein thrombus (DVT) should be recognized as a distinct entity in the anatomic spectrum of acute DVT. It is phenotypically distinct from patients with calf or femoral-popliteal DVT and has been traditionally treated with anticoagulation. However, this does not actively eliminate thrombus and 20% to 50% of patients develop PTS as a long-term sequela. Complications related to PTS incur a direct medical cost of $414 million yearly. Catheter directed thrombolysis (CDT) has evolved and research now supports early use of CDT in patients with acute iliofemoral DVT who have severe symptoms, ideally within 14 days of presentation. We aim to assess the present clinical practice at our institution, regarding management of patients with symptomatic proximal deep vein thrombus.
Methods used We analysed all patients in Mayo Clinic Jacksonville who had symptomatic iliofemoral vein thrombus in 2019 and observed the rates of CDT in the entire cohort. In a subgroup analysis of patients who did not undergo an intervention, we observed the patterns of interventional radiology (IR) consultation among the different specialties.

Summary of results

Results In a cohort of 170 patients with symptomatic ilio-femoral DVT, 144 patients had common femoral DVT, and 26 had iliac DVT (figure 1). 87.5% common femoral, and 88.5% iliac vein DVT patients did not undergo IR intervention (figure 2). In the entire cohort, 82% did not have IR consultation (figure 3). Internal medicine and medicine subspecialties were more likely to consult interventional radiology for evaluation than the emergency room (ER) physicians (p=0.04) (figure 4).

Discussion CDT has been shown in many studies to significantly reduce the risk of PTS and improve quality of life. The cost of this procedure can be high, however the long term negative impact of PTS on society cannot be underestimated and include: a large health care cost incurred from managing complications of PTS, reduced quality of life, decrease in work productivity with subsequent reduction in patient's income and increase number of patients with disability. Our research shows that there exist uncertainty and clinical equipoise among physicians. This may stem from a lack of consensus from various societies on the role of CDT in this population. In addition, ER physicians have high work volume and may overlook cases appropriate for an intervention. Ultimately this results in some patients not benefiting from this intervention, which is best when done within that 14 day period. These patients are then seen months-years later by vascular surgeons, and haematologists for complications of PTS at which time the window has already been closed for the best possible chance of alleviating this.

Conclusions There exist significant practise variations among physicians managing symptomatic proximal vein DVT. We next aim to propose a quality improvement initiative to further address this gap which is outlined in figure 5 below.
A CASE OF POLYCYTHEMIA VERA WITH THE HIGHEST HEMOGLOBIN AND HEMATOCRIT EVER RECORDED

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Purpose of study Polycythemia vera is a rare type of blood cancer that is caused by genetically mutated hematopoietic stem cells. Many cases of polycythemia vera are diagnosed incidentally because of the disease’s commonly slow indolent clinical course. Polycythemia vera is currently managed by daily low dose aspirin, phlebotomies and, at times, cytoreductive agents. Case report: A disoriented non-verbal 78-year-old male patient was brought to the emergency department after being found covered in his own urine by his family. Chest x-ray was negative for any acute pathologies, whereas a CT scan revealed focal encephalomalacia in the right temporal lobe suggestive of an old stroke with no evidence of a recent stroke. The initial complete blood count (CBC) was significant for a hemoglobin of 26.0 g/dL and hematocrit of 76.9%. The patient was subsequently given intravenous fluids, therapeutic phlebotomies and started preemptively on aspirin and hydroxyurea with the objective of keeping his hematocrit <45%. No potential sources of secondary polycythemia were found on further imaging. The next day, a repeat CBC revealed a hemoglobin of 24.6 g/dL and a hematocrit of 75.7%. A diagnosis of PV was confirmed once the PCR assay came back positive for a V617F mutation. Hospitalization was complicated by an episode of hematemesis due to H. pylori-induced gastric ulcers. The patient was transferred to the ICU where he was intubated and started on antibiotics. Patient eventually recovered and was discharged.

Methods used -

Summary of results Polycythemia vera (PV) is a rare hematological disorder. It causes an exacerbation of erythropoiesis due to genetically damaged hematopoietic stem cells. PV belongs to the family of myeloproliferative neoplasms (MPN), which also includes essential thrombocythemia, primary myelofibrosis, chronic myelogenous leukemia, chronic neutrophilic leukemia and chronic eosinophilic leukemia. This disease is generally diagnosed around the age of sixty with a global incidence that is slightly higher in men (2.8 per 100,000) than in women (1.3 per 100,000). PV currently affects around 0.6 to 1.6 per million patients in the USA. Because PV is more commonly diagnosed in the elderly, its prevalence is on the rise. The mutated genes linked with this disorder are JAK2 and TET2. Associated symptoms are abdominal discomfort, dizziness, blurry vision, splenomegaly, headaches, pruritus, facial plethora and vascular thrombosis. One of the most feared complications of polycythemia vera is development of thromboembolic events. PV patients can be classified as ‘low-risk’ or ‘high-risk’ based on their age and history of thrombosis. Low risk patients often require a combination of therapeutic phlebotomies and daily low-dose aspirin, whereas high risk patients need a combination of therapeutic phlebotomies, daily low-dose aspirin and a cytoreductive agent such hydroxyurea. Studies have shown that the timely initiation of such interventions is important in reducing the risk of PV-related complications.

Conclusions -

Complete blood count (CBC) on admission revealing an extremely high hemoglobin and hematocrit, Trend of complete blood count (CBC) during hospitalization. Decrease of hemoglobin and hematocrit indicating favorable response to treatment.
Case Report: Introduction: Thrombotic Thrombocytopenic Purpura (TTP) is a microangiopathy caused by severely reduced activity of von Willebrand factor (vWF)-cleaving protease ADAMTS13 (A Disintegrin And Metalloproteinase with a Thrombospondin type 1 motif, member 13), resulting in multi-organ damage. We present a case of a 52-year-old (yo) male (M) presenting with intermittent abdominal pain. Case Presentation: 52-y.o. M with no known PMH, not on any medication, presented with intermittent mid to left upper quadrant abdominal pain for one month. He also admitted to a vague, left-sided headache for 2 days. Physical exam was remarkable for faint ecchymosis on the left upper shoulder, right forearm, and right lower thigh. There was no lymphadenopathy or splenomegaly. Laboratory results were significant for a platelet count of $12 \times 10^3$ mcL, elevated LDH at $616$, haptoglobin $<20$, mildly elevated indirect bilirubin at $1.9$ with hemoglobin at $13.8$, and normal creatinine, transaminase, and lipase levels. Patient had PLASMIC score of 6. Peripheral blood smear showed an average of 4 schistocytes per high power field and polychromasia. Treatment with Plasmapheresis and prednisone therapy was started. Platelet count improved to $217 \times 10^3$ mcL at 10 days and 30 days after starting treatment increased to $10.8\%$ and $46.8\%$, respectively. Prednisone taper continued.

Methods used

Summary of results

Discussion: TTP is an acute and life-threatening disease caused by reduced activity of vWF cleaving protease ADAMTS13 causing accumulation of vWF multimers. It leads to small-vessel platelet-rich thrombi causing thrombocytopenia, microangiopathic hemolytic anemia, and multi-organ damage. Patients frequently present with central nervous system involvement with laboratory findings characterized by thrombocytopenia, anemia, renal dysfunction, elevated indirect bilirubin. Atypical presentations can be described as discordance between clinical and laboratory findings in patients later diagnosed with TTP. Literature reported few cases of atypical presentations of TTP such as acute coronary syndrome, acute stroke, visual disturbances, isolated thrombocytopenia, and pancreatitis. Abdominal pain without accompanied pancreatitis as a presenting symptom of TTP is rare.

Conclusions

Conclusion: Atypical presentation makes TTP diagnosis difficult and results in a delay in treatment. The literature review suggests that TTP can present with some very unusual manifestations, therefore its identification is critical for appropriate management. As in this patient, abdominal pain may be a presenting complaint. The isolated low platelet count in the absence of anemia highlights the importance of smear review and screening new-onset thrombocytopenia patients for hemolysis with reticulocyte count, LDH and haptoglobin.

Purpose of study: Proposal for an oral (or if required, parenteral) COVID-19 vaccination based upon this described technology. Investigational theory under study for the past 9 months of COVID-19 growing season. Coronavirus can attack and infect plant species. It was found that SARS-CoV-2 can infect various plant species. Others have found plants, for example tobacco as a good growth medium for Coronavirus and SARS-CoV-2. This current study has found various plants species infected with SARS-CoV-2 by rPCR. As the plants were located beside a well used hiking trail for humans, and were infected along the trail including various species with SARS-CoV-2, hypothesized that human airborne contact had caused infection in the bordering plants. Humans were observed to be coughing while walking on the trail, and were not wearing masks. The plant leaves developed small circular colonies of the virus, which became self-limited at several millimeters in diameter. All of the plants were clear of these lesions before the COVID-19 Pandemic. The plants ‘immune’ system produced antiviral agents, including lectins which limited the growth of the colonies and prevent death of the leaf and whole plant. The fungal cultures of the ‘spots’ were negative. The rPCR of all spots tested in the present series was positive for SARS-CoV-2. Hypothesis, that self-augmentation
of the virus occurred by the natural culturing in plant leaves that produce antiviral agents as part of their ‘immune system.’ Hypothesis, a symbiotic type relationship developed between the plant using its chemical immune system, and the virus allowed to replicate in an augmented fashion to allow both the virus and the host to survive and grow. As the top candidates for the oral vaccine are nontoxic, hypothesis involves the maceration of the infected leaves, mixing with a nontoxic adjuvant and flavoring to promote assimilation and palatability, with the proposed route of entry being mastication, thus exposing the oral-nasal mucosa to the vaccine, with the probable best of immunity to usual exposure to the SARS-CoV-2 virus, that is the oral-nasal mucosa, upper airway.

**Summary of results** pPCR SARS-CoV-2 positive, cell culture ‘lysis experiment’ positive, EM and light microscopy positive, fungal culture negative.

**Conclusions** TABLE OF HYPOTHESES AND STUDY RESULTS (HYPOTHETICAL, OBSERVED, PROVEN) 1. The first hypothesis that the virus is attenuated by the plant, using its innate chemical immune system. Similarly, Pasteur used chemical such as phenol to attenuate viruses for one of the first successful vaccines. Observed. 2. Hypothesis, the plants ‘immune’ system produced antiviral agents, including lectins, flavonoids, and others, which limited the growth of the colonies and prevent death of the leaf and whole plant. Proven. 3. Hypothesis is that the nontoxic plants, such as Vine Maple sp.(Acer cincinatum), could be used to produce and oral plant attenuated vaccine. Hypothesis. 4. Hypothesis involves the maceration of the infected leaves, mixing with a nontoxic adjuvant and flavoring to promote assimilation and palatability, with the proposed route of entry being mastication, thus exposing the oral-nasal mucosa to the vaccine, with the probable best of immunity to usual exposure to the SARS-CoV-2 virus, that is the oral-nasal mucosa, upper airway.
consisting of prolonged runs of high amplitude (152uV) bihemispheric bisynchronous rhythmic (generalized) spike-and-wave discharges at a repetition rate of 3 Hz, lasting ten minutes. Clinically the patient was observed to have eyes open and was staring. Pharmacotherapeutic intervention consisted of Ativan challenge which demonstrated momentary dampening of GSWD. This was followed by uptitration of propofol from 7 mcg/kg/min to 25 mcg/kg/min Burst suppression was achieved with Propofol titration and resultant resolution of GSWD. 

Methods used This is a single-center retrospective case report of de novo absence status epilepticus. 

Summary of results Diffuse cerebral anoxic injury after cardiac arrest can be a cause of de novo absence status epilepticus. The patient’s EEG showed nonconvulsive status epilepticus (NSCE) characterized by generalized high amplitude spike-and-wave discharges at a repetition rate of 3 Hz. Clinically the patient was unresponsive with eyes open and staring. Pharmacotherapeutic intervention with propofol induced burst suppression and resolution of GSWD. 

Conclusions Generalized spike-and-wave discharges (GSWD) is an electrophysiological signature commonly reserved for age-related childhood or adolescent-onset epilepsy that is genetically determined. It is accepted that GSWDs seen on electroencephalography (EEG) recordings are not associated with underlying structural brain lesions. However, we postulate that absence status epilepticus (ASE) electrophysiologically associated with GSWD can occur in nongenetic cases and in older patients with acute encephalopathy from drug etiologies such as overdose/withdrawal, fluid/electrolyte imbalance, or systemic infections as well as acute underlying structural brain lesion such as diffuse cerebral anoxic ischemic injury. This case demonstrates generalized spike-and-wave discharges (GSWD) clinically correlated with staring (absence seizure) inferring de novo absence status epilepticus.

Abstracts

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<th>A RARE CASE OF TALL CELL VARIANT PAPILLARY THYROID CARCINOMA WITH UNUSUAL BIG SIZE METASTASIS TO CERVICAL LYMPH NODES IN A HYPERTHYROID PATIENT</th>
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<td>1Marium Agladze, 1Masoud Amini, 1Stuart Morduchowitz, 1Issac Sachmechi, 1Internal Medicine, Icahn SOM at Mount Sinai/Queens Hospital Center, Flushing, NY, USA; 2Endocrinology, Icahn SOM at Mount Sinai/Queens Hospital Center, New York City, NY, USA; 3Endocrinology, Mount Sinai Doctors, NYC, NY, Unit</td>
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Case report Papillary Thyroid Carcinoma (PTC) is generally characterized by an excellent 10-year survival rate of >95%. However, some histologic types demonstrate aggressive behavior. The tall cell variant (TCV) of PTC, accounting for approximately 1% of papillary cancers, is an aggressive histologic variant. We are presenting a case of 44yo F with past medical history (PMH) of hyperthyroidism presenting with enlarging mass in the neck x 4 months Case Presentation - 44 yo F with PMH of Hyperthyroidism presented with enlarging, non-tender 5–6 cm soft mass on the right side of the neck. Ultrasound of the thyroid showing multinodular goiter (MNG) with 2.3 cm calcified nodule in the right thyroid lobe and 2 complex cysts on the right side of the neck, the largest 4.5 × 4.1 cm in size (figure 1). CT scan of the neck also revealed MNG with right-sided metastatic lymph nodes and tracheal deviation. The patient denied a history of radiation exposure, shortness of breath, neck pain, change in voice, or weight loss. Fine needle aspiration of the right thyroid nodule and neck node was consistent with atypia of undetermined significance(AUS) and metastatic PTC, respectively. Total thyroidec-tomy was performed with the right lobe measuring 6.3 × 4.6 × 2.1 cm with the tumor size of 2.5 × 1.5 × 1.0 cm and the left one measuring 4.5 × 3.6 × 1.2 cm with mass 0.6 × 0.5 × 0.5 cm in size (figure 1). 

Discussion Diagnosis of multifocal TCV PTC (without angio/ lymphatic or perineural invasion and no margins involved) was made based on histopathologic features. There was metastatic spread to 4 cervical lymph nodes with the largest measuring 4.5 cm. Pathologic state T2N1b. Molecular studies were negative for gene mutations, including BRAF, TERT, VEGF. The patient underwent 100mc I-131 ablation therapy. Post therapy total body scan showed a 4% uptake in the neck without distant metastasis. The patient was started on levothyroxine suppressive treatment. Compared to classic variants of PCT, TCVs have an unfavorable prognosis. In the review of literature and meta-analysis of 453 patients with PTC, only 134 patients had TCV with > 50% of them with lymph nodes metastasis >1 cm in size. There was no mention of the size of the largest metastatic lymph node mass. It was found that the presence of positive nodes, a high number of nodal metastasis, and a large size metastatic node (>1 cm) conferred a worse prognosis. 

Conclusions To the best of our knowledge, there are no cases reported with such a big metastatic lymph node mass. Future studies are necessary to integrate data derived from histological criteria, image analysis, molecular testing, and clinical outcomes in order to standardize the diagnosis, real prognostic significance, and optimize the management of TCV of PTC.
A RARE CASE OF THYMIC NEUROENDOCRINE TUMOR PRESENTING WITH GENERALIZED WEAKNESS AND DYSPNEA

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Purpose of study Introduction: Thymic tumors are among the rarest forms of malignancy accounting for 0.13 cases per 100,000 people in the United States. Even rarer is its subgroup, thymic neuroendocrine tumor (NET). Here we discuss a rare case of Adrenocorticotropic hormone (ACTH) secreting Thymic NET. Case Presentation: A 38-year-old male with no past medical history presented with generalized weakness and dyspnea for 1 month. He was found to have hypokalemia at 2.4 mmol/L and metabolic alkalosis. Chest X-ray and CT chest revealed anterior mediastinal mass measuring 9 × 10.3 × 6.1 cm (figure 1, 2). Further workup showed elevated morning serum cortisol and ACTH levels, no response to high dose dexamethasone suppression, absolute CD4 count of 98, negative HIV test, normal metanephrine, acetylcholine binding antibody, and human chorionic gonadotropin levels. Biopsy of mass was reported as a grade 2 neuroendocrine tumor atypical carcinoid variety, positive for cytokeratin AE1/E3, Cam 5.2, synaptophysin, chromogranin, and ACTH and negative for CK7. The patient eventually underwent complete thymectomy and mediastinal mass resection with lymph node dissection.

Methods used Summary of results

Discussion Presenting symptoms of Thymic NET can include cough, dyspnea, superior vena cava syndrome (20%), or hoarseness. Thymic NET rarely presents with paraneoplastic syndromes such as carcinoid, acromegaly, SIADH with the most common being Cushing’s syndrome. Few cases are reported in literature with Thymic NET associated with Cushing’s syndrome presenting with cushingoid appearance, hyperpigmentation, facial fullness, plethora as well as weakness. Thymic NET was also reportedly observed in males with 65% 5-year mortality rate with associated paraneoplastic syndromes compared to 35% without it. The mainstay of treatment is surgical resection, even in advanced stages, as it is a strong predictor of overall survival. There is no drug regime proven to have a consistent response, although adjuvant chemotherapy regimen (etoposide and cisplatin, and 5-fluorouracil) have been tried.

Conclusions In conclusion, Thymic NET is a rare tumor with an aggressive course. Further studies need to be done to investigate the early diagnosis of thymic tumors. Surgical resection is the mainstay of treatment. Effective chemotherapy regimens need to be investigated for the optimal management of thymic NET.

A RARE CASE OF PULMONARY LARGE CELL NEUROENDOCRINE CARCINOMA

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Purpose of study Pulmonary large cell neuroendocrine carcinoma is a very rare type of lung cancer that is treated with surgical resection in conjunction with chemotherapy. This tumor has a very poor survival rate because of its aggressive nature and the lack of standardized treatment protocols.

Case report A 65-year old former smoker male presented with dry cough, back pain and unintentional weight loss. CT of the chest showed complete obstruction of the left mainstem bronchus due to a 9.3 cm mass like lesion in the left upper lobe and lingula. Endobronchial biopsy showed LCNEC in the left main bronchus. PET scan revealed left sided pleural effusion, mediastinal lymph nodal involvement and metastasis to the right lung, liver, and bones. The diagnosis was made for stage IVB L-LCNEC. Patient underwent surgical debridement and debulking of the left mainstem bronchus. It was followed by 4 cycles of cyclophosphamide and etoposide without any clinical improvement. It was followed by RT and maintenance immunotherapy with nivolumab plus denosumab. Patient’s pain and symptoms improved after 10 rounds of RT. Patient remained on nivolumab and denosumab and has so far completed two cycles and reports improvement in symptoms.

Methods used -

Summary of results Lung-Large cell neuroendocrine carcinoma (L-LCNEC) is a high-grade neuroendocrine neoplasm that accounts for less than 3% of all cases of lung cancers. The age-adjusted incidence of LCNEC is 0.31 per 100,000 people in the United States. L-LCNEC is a type of non-small cell lung cancer (NSCLC) with varying clinical, morphological and
molecular features that overlap between both small cell lung cancer (SCLC) and NSCLC. This is what makes it a diagnostic challenge. It is more common in male smokers at the median age of 65 years. Very limited data is available about standardized treatment protocols for this cancer. We report a case of L-LCNEC treated by palliative surgical debridement followed by chemotherapy, radiotherapy (RT) and immunotherapy. Patients with early-stage L-LCNEC (TNM I or II) should undergo surgical resection of the tumor in combination with perioperative, neoadjuvant or adjuvant chemotherapy. The addition of platinum based chemotherapy after surgical resection has improved 5 year overall survival from 47.4% to 88.9% and 2-year progression free survival from 47.8% to 86.7%. Retrospective studies have shown that SCLC treatment regimen of Etoposide-Platin had better survival outcomes (median: 44 vs 11 months) as compared to NSCLC regimens such as Platin in combination with Paclitaxel, Gemcitabine or Vinorelbine. In more advanced unresectable cases, chemotherapy and radiation therapy should be used. Patients who have unresectable stage III LCNEC or patients who have positive lymph nodes post-surgery should undergo four courses of Etoposide-Platin with concurrent radiation during the first two courses. For stage IV LCNEC, patients should receive four to six courses of Etoposide-Platin. Although data is limited, initial studies have shown positive responses with checkpoint inhibitor anti PD1 antibodies such as nivolumab, pembrolizumab and ipilimumab. Multiple clinical trials are underway to evaluate the safety and efficacy of these novel agents in L-LCNECs.

Conclusions CT chest showing 8.6 cm perihilar mass compressing the left main pulmonary artery, CT chest showing tumor associated with narrowing of the left main bronchus and underlying atelectasis.

Abstract P14 Figure 1

Abstract P14 Figure 2

Purpose of study Introduction - Non thyroid metastases (NTM) to the thyroid gland are relatively uncommon. They may originate mainly from kidney, lung, head and neck with

Abstract P14 A RARE CASE OF INVASIVE (INfiltrating) DUCTAL CARCINOMA OF THE BREAST WITH THYROID GLAND METASTASIS

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Abstracts
Renal Cell Carcinoma being the most common. Thyroid metastases from breast cancer are very rare. We present a case of a 56-year-old (yo) Hispanic female (F) with breast cancer metastases to the thyroid gland. Case Presentation - 56 yo Hispanic F with stage IV invasive ductal carcinoma (IDC) of the left breast diagnosed in 2015, ER+/PR-/HER2/neu-. Oncotype DX RS 44, status post left lumpectomy, metastasis to the bones, lungs, liver, and the choroid of the right eye. The patient was getting chemotherapy with adjuvant radiation therapy and later developed intermittent hoarseness in 2018. CT and Ultrasound of thyroid gland revealed left (L) vocal cord (VC) paralysis and focal nodules in both thyroid lobes, respectively (see figure 1 and 2). Fine needle aspiration (FNA) cytology of the right thyroid lobe was done and revealed poorly differentiated cancer most likely breast origin. She underwent left VC medialization, but thyroidectomy was deferred given no survival benefit and post-surgery complications.

Methods used Case report

Summary of results Discussion - The period between metastatic lesions in the thyroid gland after the detection of primary cancer is variable. One study reported the mean interval time of 3.3 years with the longest being 16 years after the diagnosis of breast cancer. There are no consistent guidelines for managing such patients. Currently, there is no evidence to support any other adjuvant or alternative treatment to surgery. Decision-making regarding lobectomy or total thyroidectomy should balance the possibility of getting long-term survival outcomes versus its complications. According to a larger series from Mayo Clinic, median survival for patients with thyroidectomy was 30 months whereas in patients without resection was 12 months. As NTM from breast cancer is most often managed with surgery, there were not enough reports of breast cancer NTM treated with expectant management to determine if surgery was associated with improved survival in this group.

Conclusions Although uncommon, based on the review of literature thyroid gland metastases should no longer be considered rare occurrences. In patients with thyroid nodules with a history of malignancy, the possibility of thyroid metastasis should be seriously considered.

P15 REGULATION AND FUNCTION OF THE I6A37 TRNA MODIFICATION

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Purpose of study The aim is to investigate the regulation and function of tRNA isopentyladenine transferase enzyme in Escherichia coli. We aimed to execute screens for the identification of small RNA regulators of MiaA. The study will also investigate if i6A tRNA modification is necessary for the expression of major heat shock and mitochondrial proteins.

Methods used We constructed a chromosomal miaA-lacZ translational fusion driven by the arabinose responsive PBAD promoter and used it to screen against an Escherichia coli small RNA library. Using CsrB, one of our candidate sRNA regulators from our genetic screen, we measured the steady state levels of MiaA by Northern Blot in a PBAD-miaA2(P2HS)-lacZ translational fusion strain background. We measured the steady state levels of MiaA in the wild type, ΔcsrA::zeo mutant strain, and ΔcsrA::zeo pBR-pLac-csrA complementation strain to determine if a combination of the pair would restore the wild-type genotype.

Summary of results Upon measuring the effect of small RNAs on miaA expression using quantitative β-galactosidase assays, we saw a 5-fold decrease in the expression of MiaA in the miaA-lacZ translational fusion containing sRNA CsrB, suggesting that this sRNA may play a role in the regulation of post-transcriptional expression of MiaA. From our northern blotting analyses, we observed a 6-fold decrease in MiaA expression in the absence of csrA, suggesting that csrA is essential for MiaA expression.

Conclusions MiaA has a human homolog known as TRIT1. Mutations in TRIT1 have been associated with rare diseases such as MELAS and MERRF syndromes. These diseases are associated with mitochondrial dysfunction. Understanding the mechanisms of bacterial sRNAs, and the miRNAs associated with these diseases could potentially afford the insight into effective cures. Identifying, mapping and characterizing how MiaA is regulated post-transcriptionally will give us an increased understanding in the maintenance and regulation of the normal function of E.coli to conserve homeostasis and translation fidelity.

P16 THE IMPORTANCE OF A DISCHARGE CALLBACK PROCESS IN A PEDIATRIC EMERGENCY DEPARTMENT SETTING

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Purpose of study Pediatric emergency department visits can be a stressful time for patients and their caregivers. This high stress environment can lead to questions and clarifications post-discharge. We implemented a post-discharge callback system to resolve these for a focused subset of patients who historically have provided the most negative comment feedback on ED patient experience surveys. We hypothesized that comment types would shift to more positive than negative and the themes of the comments received would change.

Methods used We developed a discharge callback process that focused on patients who were triaged as ESI 4 during their emergency department visit. Over a 6-week period, patients were called the day after discharge and asked if they had questions regarding their recent ED visit, in addition to questions regarding current health, post-discharge instructions, prescriptions, or follow-up instructions if applicable. A maximum of 3 discharge calls were made if needed in order to contact the patient or family. Any questions regarding health care needs were followed up by a licensed healthcare provider within 24 hours with a maximum of 3 attempts. At the end of the project timeframe we analyzed comments received from our patient experience surveys to identify if there was a shift in comment types and their themes.

Summary of results During the 6-week period, 2710 calls were made to contact 1618 patients’ caregivers. Follow up was requested by 149 families with a healthcare provider. There was no significant change in the number of comment types received. Thematic analysis of the patient experience survey
comments received during this time period, revealed a reduction in questions regarding the recent ED visit and post-discharge needs.

Conclusions The institution of an ED discharge callback system can effectively reduce patients’ and families’ questions regarding post-discharge care by providing an opportunity to clarify care after they have left the emergency department.

P17 RACE/ETHNICITY OF FATAL GUNSHOT WOUNDS IN CHILDREN

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Purpose of study All children shot and killed in Los Angeles with racial/ethnic parameters.

Methods used The shooting and killing of children has become a major problem. A case study involving Los Angeles County and an analysis of all children shot and killed during 1993 and 1994. Children were defined as those 15 years of age and under. The cases were identified from the Los Angeles County Coroner, Los Angeles Police Department and the LA Sheriff’s Department. Forensic, sociological and legal data were collected by a team of 20 experts in the various fields of investigation, and all data collection started at the scene of the shooting, with follow-up continuing for the next 25 years. Autopsies were viewed, all forensic and law enforcement reports were reviewed, all possible witnesses, family, friends, and gang members were interviewed. Statistical analysis of all data was done using the Statgraphics by SGI(R) program. Ethical rights approval was sponsored by the ACLU, and the County of Los Angeles.

Summary of results 195 children were identified as shot and killed in Los Angeles County. 78% were confirmed to be gang-related, defined as either the victim or the shooter were legally identified as being in a street gang. All of these were ‘drive-by shootings.’ The mean age of the victim was 14 (S.D. 5.4). The sex ratio of the victims equaled the shooters, at male 83% and female 17%. The race/ethnicity of the victims was 52.3% Hispanic, 25.4% Black, 11.9% Caucasian, and 8.8% Asian; which also approximated the race/ethnicity of the victims. The same race/ethnicity between shooter and victim was extremely robust with a Chi Squared correlation value of 113.3 and a probability of being the same race/ethnicity p<0.00001 . The mean age of the shooters was 17 years of age. The range was from age 3 to 31. The sex ratio was 96.9% to 3.1%. The racial/ethnic distribution of the shooters was Hispanic 41.5%, Black 30.1%, Asian 13.8%, Caucasian 12.2%. Of the gang killings, 58.3% involved same, and 41.7% different race/ethnicity. As many of the killings were gang related, there were 17 ‘intragang’ killings, and as the gang is usually composed of the same racial/ethnicity, all 17 were same race/ethnicity killings, including 8 of which were within their own gang chapters, and also of the same race/ethnicity.

Conclusions The shooting deaths of the children had a very high statistical correlation to be along racial/ethical lines between victim and shooter.

P18 MONOAORTHRITIS MYCOBACTERIUM TUBERCULOSIS: A CASE REPORT

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Purpose of study

Introduction Musculoskeletal TB is a rare entity, consisting of 10%–25% of total extrapulmonary TB cases. The most common site being the spine with 50-69% and less common sites include knee, hip, ankle, and foot with 10%–13% cases of each site. Here we report a statistically rare presentation of an older adult patient with Mycobacterium tuberculosis in the knee. Case Report: A 60-year-old male with a history of Hypertension, Diabetes Mellitus type2 presented with right knee pain for 3 months, otherwise asymptomatic. He came to the United States from India 30 years ago. No prior history of TB infection or contacts. On examination, the patient appears cachectic, alert, and oriented. Decreased breath sounds were noted in the right upper lung field. The right knee was tender, swollen, and erythematous. X-ray right knee revealed effusion, figure 1. Chest X-ray showed diffuse reticulonodular opacities in the lungs bilaterally. Chest CT with contrast showed pulmonary cavities and tree in bud opacities, figure 2. Quantiferon was positive. Synovial fluid and sputum were positive for Acid Fast Bacilli and negative for gram stain. RIPE
therapy was initiated for miliary tuberculosis with right knee involvement.

Methods used

Summary of results Musculoskeletal TB is a rare condition among extrapulmonary TB. Knee involvement in musculoskeletal TB is mostly observed in highly prevalent areas and makes the diagnosis challenging in an area where TB incidence is very low. Studies report that usually immunocompetent individuals may not present with typical symptoms and a definite diagnosis is delayed from months to years. Radiographic evidence will be helpful for diagnosis which shows destructive changes and bone erosion. Microbiological and histopathological findings are the gold standard for diagnosis. Tubercular arthritis can be destructive in nature if antitubercular therapy is not instituted early in the course of the disease. Treatment options depend on the extent of the infection and the patient’s immune status. Medical treatment is always the 1st choice. Surgical procedures can be considered if there is no clinical improvement. In our patient, infection is treated medically with RIPE therapy.

Conclusions Although skeletal tuberculosis is very rare in developed countries, one should suspect TB arthritis in the differential along with other diagnoses. It is important to emphasize the need for early diagnosis to prevent further complications of joint destruction.

ARTIFICIAL INTELLIGENCE IN ISOLATED HEART CELLS THROUGH PHOTONS CONTROLS THE ELECTRICAL CONDUCTIVITY AND ENTANGLEMENT BETWEEN HEART CELLS

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Purpose of study We measured photonic acceleration of supercondcut (S.) and entanglement (E.) across junction gaps in isolated heart myocytes using KCL electrodes.

Methods used Cytoplasmic conductivity was measured (G.I.). An increase in G.I. induced by Enalapril (1 ug/ml in 4 Min.) was measured intracellularly. Ang II was injected (G.I.) using a similar dose.

Summary of results An increase in G.I. of 106% by E. was observed a reduction of G.I. (55%) was observed by Ang II (1 ug/ml in 4 Min.) without a plateau. This increase by E. produced a significantly the coupling of heart cells improving the left ventricular function. These changes occur through photons induced by E.-Ang II intracellularly at the temperature (T.) of 27 grades C. Probably, by an interaction on photons in a cytoplasm liberated from an internal cloud.

Conclusions This shows the importance of measuring these parameters by artificial intelligence intracellularly in isolated myocardial cells improving coupling of them and as a consequence a more efficient heart function.

IMPROVING PATIENT OUTCOMES THROUGH THE PREDICTION OF SKELETAL-RELATED EVENTS IN BONE METASTASES FROM MELANOMA AND CANCERS USING ARTIFICIAL INTELLIGENCE

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Purpose of study According to the National Cancer Institute, over 1.8 million people in the United States will be diagnosed with cancer in 2020. In advanced stages, cancer can spread to other parts of the body, including the bones. Bone metastases can cause skeletal-related events (SREs) in patients, which are defined as pathological fractures, the need for surgery or radiation to bone, and spinal cord compression; both bone metastases and SREs can impact a cancer patient’s long-term chances of survival and quality of life. Thus, accurate prediction of SREs from bone metastases before their occurrence can be crucial to
help physician-surgeon teams personalize patients’ best treatment and management plans as early as possible and ultimately enhance patient outcomes.

Methods used In this research, we designed and developed a machine learning model based on support vector machine learning to predict skeletal-related events in cancer patients with bone metastases derived from a primary malignancy in melanoma, prostate cancer, breast cancer, or lung cancer. Applied to a clinical patient dataset of over 900 patients, the machine learning model was trained with 60% of the patient data and tested with 40% of the patient data.

Summary of results In predicting skeletal-related events in cancer patients with bone metastases, the machine learning model achieved an overall accuracy of 87.5% with an AUC of 0.883.

Conclusions The results highlight the robust application of artificial intelligence and support vector machine learning in predicting skeletal-related events in bone metastases patients with high accuracy and precision. By predicting SREs before they happen in future patients, the computer-aided diagnosis tool can ultimately help guide healthcare teams’ personalized treatment plans for their patients and enhance patient outcomes globally.

P21

ENHANCING PAIN MANAGEMENT AND REHABILITATION OUTCOMES IN STROKE PATIENTS WITH ARTIFICIAL INTELLIGENCE AND MEDICAL IMAGING

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Purpose of study According to the Centers for Disease Control and Prevention, more than 750,000 Americans have a stroke every year. Stroke is the third leading cause of death in the United States. To aid patient outcomes, diagnosing stroke accurately and as early as possible is important for improving patients’ survival chances. Stroke patients can then be treated with more optimized outcomes and enhanced pain control along with better rehabilitation results. Therefore, early detection and prediction of stroke, and diagnosing pain in stroke patients early and accurately is important for rehabilitation outcomes and recovery.

Methods used In this research, an artificial intelligence model built using machine learning is applied with radiologic imaging of strokes in patients to enhance the early detection of stroke and their outcomes. The machine learning model was engineered using deep learning algorithms fitted with neural networks. Clinical data and neuroradiologic imaging from over 760 stroke patients were used for engineering and training the model. 50% of the data was used to train the machine learning model, and 50% of the patient data was used to test the model.

Summary of results The developed deep learning model was able to diagnose strokes in patients and their outcomes after pain management and rehabilitation with an overall accuracy of 87%, exceeding the diagnostic accuracies of currently published models.

Conclusions Thus, artificial intelligence algorithms and radiologic imaging can be used in conjunction to aid healthcare professionals in early prediction and diagnosis of strokes in patients and ultimately optimize their outcomes through pain management and rehabilitation.

P22

CELIAC DISEASE AND SMALL INTESTINAL ADENOCARCINOMA

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Purpose of study Celiac disease (CD) has been associated with gastrointestinal malignancies, most commonly gastrointestinal lymphoma. Rare malignancies have also been reported, such as small intestinal adenocarcinoma. We present a case of a 91 year old male with a history of Celiac disease, non-compliant with a gluten-free diet, presented with weight loss, abdominal pain and gastrointestinal bleeding secondary to a newly discovered adenocarcinoma of the jejunum. 91 years old male with a history of CD, non-compliant with a gluten free diet, presented with abdominal pain and weight loss of two months duration. Subsequently, he developed hematemesis and hematochezia with hypotension and tachycardia. Tenderness was noted on palpation of the upper abdomen. Labs revealed white cell count of 13.2 x 10^3/uL (reference (R): 4.5 - 11.0 X 10^3), Hemoglobin of 5.9 g/dl (R: 12 - 17). Computed tomography of abdomen and pelvis demonstrated a 6.8 cm dilated proximal jejunum (figure 1). four units of packed red blood cells and two liters of normal saline were given.
Intravenous pantoprazole was administered. Small bowel enteroscopy showed two non-bleeding superficial clean base ulcers in duodenum and an ulcerated jejunal mass. Biopsies from the mass showed an invasive and poorly differentiated carcinoma. Subsequently, exploratory laparotomy revealed additional masses in the ileum and transverse colon suspicious for malignancy; thus, partial small bowel and colonic resection with end colostomy were performed. The tumor in jejunum measured 1.7 x 1 x 0.2 cm. Pathologic evaluation revealed an invasive poorly differentiated carcinoma with gland formation only in jejunal mass (figure 2). Cytokeratin was immunoreactive (figure 3). CK7, CK20, TTF-1, LCA, CD56, synaptophysin and chromogranin stains were negative. Regional resected lymph nodes and other lesions were devoid from cancer. Patient postoperative course was uncomplicated, and he was discharged with outpatient oncology follow up. He was offered chemotherapy but declined any treatment. CD increases risk for developing small intestinal adenocarcinoma. While there are no guidelines supporting routine screening, CD patients who are non-compliant with a gluten-free diet or who develop symptoms such as weight loss and abdominal pain might warrant further investigation with abdominal imaging or endoscopy.

Methods used Summary of results

Conclusions

Abstract P22 Figure 3
Prednisone was added to the treatment and he finished 5 sessions of IVIG. Patient weakness gradually improved and eventually was extubated. He was discharged on pyridostigmine to a rehabilitation facility for continuation of physical therapy. When evaluating for dysphagia, it’s very important to differentiate oropharyngeal from esophageal dysphagia to guide appropriate testing and treatment. MG is a systemic autoimmune disease with indolent manifestations that can rapidly progress to a more severe and life threatening course. It’s crucial to understand that dysphagia can be an initial and the sole manifestation; hence, an early recognition is important to guide appropriate management to reduce the risk of severe complications from MG.

**P25**

**UNUSUAL MANIFESTATION OF AMPULLARY ADENOCARCINOMA PRESENTING WITH GASTRIC OUTLET OBSTRUCTION**

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**Case Report**

Ampullary adenocarcinoma is a tumor that arises in the ampulla of Vater. The mean age at presentation is 65 year old. Clinical manifestations include weight loss, jaundice, and abdominal or back pain. However, gastric outlet obstruction is an extremely rare presentation. We report a case of 38-year-old male presenting with gastric outlet obstruction. Pathologic evaluation was consistent with ampullary adenocarcinoma in the papilla of the duodenum with pancreatic extension. A 38-year-old male who presented with abdominal discomfort, vomiting, constipation, and weight loss of two weeks duration. On physical examination, his vital signs were within normal limits and his abdomen was notably distended. Blood tests were unremarkable. Computed tomography of the abdomen and pelvis showed a soft tissue retroperitoneal mass in contact with the infra-renal aorta (figure 1). Endoscopy revealed extrinsic stenosis in the third duodenal portion (figure 2) and a 4.8 x 5.3 cm mass. Biopsies from the stenosis revealed adenocarcinoma. Whipple surgery was performed.

**Abstract P25 Figure 1**

Histologic evaluation revealed ampullary adenocarcinoma of pancreaticobiliary origin, which was present in the duodenum with invasion into the wall and the uncinate process of the pancreas. Adjacent lymph nodes also revealed tumor cells. Post-surgical course was uncomplicated, and the patient was eventually discharged with oncologic follow up for initiation of chemotherapy. Our case presents a rare manifestation of ampullary adenocarcinoma that has not been previously reported. Ampullary adenocarcinoma, usually presents in the elderly population with non-specific symptoms such as jaundice, pain and weight loss. However, our patient presented at a relatively young age with small intestinal obstruction. Definitive treatment is surgical resection. Adjuvant chemoradiotherapy is beneficial in the presence of metastasis to the lymph nodes.

**P26**

**COVID-19 INFECTION PRESENTING AS ACUTE PANCREATITIS**

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**Purpose of study**

**Introduction** COVID-19 emerged at the end of 2019 as an epidemic of respiratory disease in Wuhan, China that later spread globally and was declared as pandemic. The common clinical manifestations of COVID-19 infection include fever, cough, myalgias, headache, sore throat, anosmia, nasal congestion, fatigue and chest pain. The most serious complications include bilateral multilobar pneumonia and acute respiratory distress syndrome. Acute pancreatitis is rarely reported in association with COVID-19 infection. We report a case of acute pancreatitis secondary to COVID-19 infection. Case Report: A 69-year-old man with past medical history of hyperlipidemia and seizure disorder presented with two days of epigastric pain radiating to back. The patient reported fever, malaise and dry cough for the last 3 days. Home medication included atorvastatin and carbamazepine for 10 and 15 years respectively. The patient denied smoking and alcohol use. COVID-19 PCR was positive. Labs showed WBC of 3800/μL, hgb 11.8 g/dL, calcium 8.4 mg/dL , lipase 426 U/L, D-Dimer 179
ng/ml DDU, High sensitivity C-reactive protein 27.5 mg/L (normal <5 mg/L) ALT 26 U/L, AST 31 U/L, alkaline phosphatase 103 U/L and total bilirubin 0.3 mg/dL. Ultrasound of the right upper quadrant and CT abdomen showed normal pancreas, common bile duct and gallbladder with no evidence of gallstones. Triglyceride level was 70 mg/dL (<149 mg/dL) on the lipid panel. The patient was diagnosed with acute pancreatitis and received treatment with IV fluids and pain medication. The symptoms improved gradually and the patient was discharged home with resumption of home medications.

Methods used Case Report

Summary of results The common differentials for acute pancreatitis include alcohol use, gallstones, hypertriglyceridemia, viral infections like mumps and measles, hypercalcemia and medication-related, etc. Normal AST, ALT, alkaline phosphatase and total bilirubin along with absence of gallstones and normal common bile duct ruled out alcoholic and biliary pancreatitis. Normal calcium level and triglyceride level rule out hypercalcemia and hypertriglyceridemia as the cause of pancreatitis. Carbamazepine has rarely been reported to cause acute pancreatitis typically soon after the initiating the therapy or with increase in the dose. The use of carbamazepine for more than 15 years without any recent dose change makes this unlikely as the cause of pancreatitis. The onset of acute pancreatitis during the timeline of COVID-19 constitutional symptoms and absence of other risk factors suggests that COVID-19 infection is responsible for acute pancreatitis in our patient.

Conclusions We report a case of acute pancreatitis secondary to COVID-19 infection. Further studies are warranted to better understand the etiology and the pathophysiology of acute pancreatitis secondary to COVID-19 infection.
Abstract P27 Figure 4  CT scan revealing hepatomegaly due to underlying HCC

packed red blood cells (PRBC) because of anemia. Patient passed away the next day due to a sudden cardiac arrhythmia.

Methods used

Summary of results Before the initiation of any therapy, HCC patients should be stratified via their Child-Pugh-Turcotte score to better assess the severity of the underlying hepatic cirrhosis. Patients who are Child-Pugh-Turcotte A and have early staged HCC should undergo surgical resection. Interventions such as liver transplant, systemic chemotherapy and/or non-surgical liver directed therapies should be reserved for unresectable tumors or if the patient is Child-Pugh-Turcotte B/C. The approximate five-year survival rate for tumor resection and liver transplant is 40% and 65% respectively. A meta analysis of several retrospective studies has shown that patients ineligible for surgical interventions could benefit from TACE combined with percutaneous ethanol injection (PEI) or radiofrequency ablation (RFA). Sorafenib remains the only standard therapeutic agent used for advanced HCC as it has shown to significantly decrease the median progression-free survival compared (6 months) to the placebo (3 months). Nonetheless, the overall prognosis of HCC remains very poor, which is why it’s very important to keep on exploring newer therapeutic options.

Conclusions

P29

HAND SWELLING AS AN PRESENTING SYMPTOM OF AUTOIMMUNE HEPATITIS TYPE I

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Purpose of study 14-year-old Hispanic female with vitiligo presented to the clinic with intermittent pain, swelling and decreased range of motion of her hands for one day and chronic fatigue. Her physical examination was unremarkable other than multiple vitiligo patches on her face, trunk and extremities. Initial lab work-up, including CBC, ESR, BMP, of non-bloody watery diarrhea for two weeks without any abdominal pain after missing 2 doses of his monthly Sandostatin/Octreotide depot injection because he was out of the country. Patient was diagnosed with carcinoid tumor in November 2009 with a liver biopsy showing neuroendocrine tumor. Echocardiogram in January 2011 showed severe tricuspid regurgitation consistent with carcinoid heart involvement. Patient started having diarrhea in January 2013 and in July 2013 he was started on monthly Sandostatin depot injections with subsequent improvement of Chromogranin and 5-HIAA levels. At time of admission, patient was tachycardic, afebrile, borderline normotensive, and labs were significant for Na of 123, K 4.4, CI 93, HCO3 21, Glucose 120, Urine Na <25, Urine osmolality was 939 and serum osmolality was 270. Infectious causes of diarrhea were ruled out with stool studies. CT abdomen/pelvis demonstrated multiple liver masses consistent with metastatic carcinoid. Urine legionella, TSH and AM cortisol were checked to rule out other causes of hyponatremia. Hyponatremia workup suggested hypovolemic hypotonic hyponatremia and patient was started on normal saline infusion. Patient’s oncologist was consulted and initially recommended aggressive hydration since patient was hypovolemic and to follow up with oncology clinic upon discharge to receive his monthly Sandostatin 20 mg depot injection because the depot form of Sandostatin was not available inpatient. However, patient’s hyponatremia worsened as sodium declined to 119 despite normal saline infusion. Patient had a presyncopeal episode while inpatient due to his hyponatremia. Patient’s metabolic acidosis, contraction alkalosis with respiratory alkalosis also worsened as bicarbonate declined to 14. Nephrology was then consulted and recommended bicarbonate drip as well as Sandostatin. After initiation of carcinoid syndrome therapy with inpatient Sandostatin 100 mcg q8h that was up-titrated to 200 mcg q8h, patient’s diarrhea, hyponatremia and metabolic acidosis subsequently improved with sodium of 132 and bicarbonate of 21 at the time of discharge.

Methods used

Summary of results Carcinoid tumors can secrete many hormones and peptides including serotonin, kallikrein, substance P, neurotensin, histamine and dopamine that may lead to electrolyte derangements especially that of hyponatremia. This case demonstrates that carcinoid tumors can cause hypovolemic hypotonic hyponatremia that is resistant to conventional management.

Conclusions Prompt use of Sandostatin should be considered for the treatment of resistant hypovolemic hypotonic hyponatremia in carcinoid tumors to reduce morbidity, mortality and prolonged hospitalization in these patients.
Purpose of study

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Methods used

Case report.

Summary of results

Autoimmune hepatitis (AIH) is a chronic inflammatory disease of the liver with characteristic antibodies and elevated gamma globulins. The disease typically presents as acute hepatitis and progresses to chronic liver disease and cirrhosis. Presentation at the initial diagnosis may vary from completely asymptomatic to liver failure and cirrhosis. Many patients present with extrahepatic autoimmune disease. Joint pain and swelling are common but relatively less common as an presenting symptom. Any prepubertal patient with constellation of rheumatological symptoms presenting with elevated transaminases should prompt workup for AIH. The diagnosis of AIH is based on the combination of clinical presentation, biochemical and immunological markers and histological criteria, and exclusion of other causes of liver failure. Liver biopsy is helpful to confirm the diagnosis. Treatment with steroids and immunomodulators are the main stay of treatment.

Conclusions

Autoimmune hepatitis(AIH) is an uncommon cause for liver failure in pediatric patients and diagnosis of AIH can be challenging due to the nonspecific presentation at the initial stages of the disease. But the presence of autoimmune disease involving multiple systems should prompt the Pediatricians to evaluate patient’s liver functions. Early diagnosis of AIH and initiation of the immunosuppressive therapy is critical to prevent further liver failure and need for liver transplantation.

Purpose of study

A 16-year-old Caucasian female with a distant history of resected neuroblastoma status-post chemotherapy presented due to three weeks of sharp, intermittent midsternal chest pain. Associated symptoms included light-headedness and shortness of breath. She also had three weeks of worsening eyelid and facial swelling. She denied fevers, night sweats or weight loss. Serial chest radiographs performed by a primary care physician revealed a small pneumothorax without consolidation, then a patchy infiltrate in the right lower lobe, and finally left lower lobe and right lower lobe consolidations. She did not improve on empiric antibiotics for community acquired pneumonia and therefore she was referred to a tertiary care center for further evaluation. Computed tomography (CT) imaging of the chest revealed a left apical, pleural-based, soft tissue mass, two nodular densities in the left lung, and mediastinal and bilateral hilar adenopathy with mild dilution of bilateral jugular veins concerning for superior vena cava syndrome. The differential diagnosis included infectious and oncologic etiologies, particularly fungal and mycobacterial infections and malignancy given her history of cancer. Initial laboratory values were unremarkable, including normal complete blood count (CBC), complete metabolic panel (CMP), C-reactive protein (CRP), and erythrocyte sedimentation rate (ESR). Infectious workup for pulmonary histoplasmosis, blastomycosis, aspergillus, and tuberculosis was negative. Oncologic work up including homovanillic acid (HVA) and vanillylmandelic acid (VMA) to screen for catecholamine secreting tumors such as neuroblastoma was also negative. Bronchoscopy with tissue biopsy revealed non-caseating granulomas. The patient was then discharged home with plans to continue work up outpatient, however, she was lost to follow up due to resolution of symptoms. She presented again five months later with worsening chest pain, shortness of breath, orthopnea, and facial swelling. Repeat CT imaging of chest demonstrated a persistent left apical mass with new development of ‘tree-in-bud’ opacities. The patient underwent repeat serologies for fungal agents. Her blastomycosis and histoplasmosis titers remained negative. A bronchoalveolar lavage (BAL) was obtained. No organisms were isolated from the culture of the BAL. Abnormal BAL cytology was identified and sent for flow cytometry, revealing 40% t-lymphocytes and an elevated CD4/CD8 ratio of 6:1 suggestive of sarcoidosis. Given the concern for pulmonary sarcoidosis, rheumatologic work up was pursued. Serum immunoglobulin G (IgG), immunoglobulin A (IgA), immunoglobulin M (IgM), immunoglobulin E (IgE), complement C3, complement C4, immunoglobulin G (IgG) subclasses 1-4, anti-double stranded DNA, serum lysozyme, anti-neutrophil cytoplasmic antibodies (ANCA) IgG (<1:20), anti-nuclear antibody (ANA) (1:80), Anti-Sjogren’s Syndrome A (SSA), Anti-Sjogren’s Syndrome B (SSB), ferritin, uric acid, and angiotensin-converting enzyme (ACE) were all within normal ranges. After extensive work up excluded infectious causes and other inflammatory disorders including vasculitis and systemic lupus erythematosus (SLE), the diagnosis of primary pulmonary sarcoidosis was made. She was started on prednisone and methotrexate. Her steroids were tapered over time. Patient was subsequently changed to azathioprine given residual disease on her chest CT scan and gastrointestinal side effects from methotrexate.

Methods used

Case study

Summary of results

Sarcoidosis is a multisystemic disease that can affect any organ with lungs and intrathoracic lymph nodes being the most common sites. The age of onset typically ranges from 20 to 60 years old, and is three to four times more common in African-Americans. Symptomatic sarcoidosis is rare in the pediatric population, thus making the diagnosis in this Caucasian female adolescent challenging. The ACE level is estimated to be elevated in 75% of patients with...
untreated sarcoidosis. Because this patient’s ACE level was normal, the BAL lymphocytosis and elevated CD4/CD8 ratio (>2:1) were crucial findings to support the diagnosis of pulmonary sarcoidosis.

Conclusions Atypical manifestations of pulmonary sarcoidosis are diagnostically challenging as clinical and radiological findings can mimic those of malignancy and infectious processes. Diagnosis requires a multifaceted approach, combining clinical presentation with typical histopathological, laboratory, and radiological findings to both exclude alternative causes of granulomatous diseases and support the diagnosis of sarcoidosis. BAL cytology and flow cytometry can provide useful information when clinical suspicion is high and objective data is insubstantial. Prompt diagnosis is important to establish optimal management with corticosteroids and biologic agents to prevent progressive organ damage and improve the burden of symptoms.

P31 PROLIFERATION AND DIFFERENTIATION POTENTIALS OF CLONAL HUMAN ARTICULAR CARTILAGE PROGENITOR CELLS
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Purpose of study Articular cartilage progenitor (ACP) cells from the superficial zone have the ability to produce stable articular cartilage in vitro. We have also found a subset of ACPs residing in deeper articular cartilage regions. The aim of this study was to compare expansion and differentiation of clones from different zones.

Methods used Cells were isolated from superficial and deep zones of normal human articular cartilage. At 20, 40, and 60 population doublings, clones were stimulated to undergo chondrogenesis in vitro in 3D pellet culture for 14 days.

Summary of results Superficial clones have a significantly higher percentage survival at 20, 40, and 60 population doublings compared with deep clones. Superficial clone-derived pellets had significantly increased (p<0.05) total glycosaminoglycan (GAG, a measure of proteoglycan production) and hydroxyproline content compared with their deep zone counterparts at 20 population doublings. Collagen X production was significantly increased (p<0.05) in deep compared with superficial ACP clones. All zonal differences were no longer evident once cells had undergone 40 or greater population doublings. No differences in the level of gene expression (p>0.05) were detected for COL1A1, COL2A1, SOX9, or PRG4 either prior to chondrogenesis (day 0) or 14 days after induction for clones at 20, 40 or 60 population doublings. A significant increase in COLXAI gene expression (p<0.05) in deep clones was observed at 40 population doublings after chondrogenic induction for 14 days but not prior to induction (day 0) or at either day for clones of 20 or 60 population doublings. ACAN gene expression was also significantly increased (p<0.05) in day 14 deep zone pellets at 40 population doublings compared with superficial zone pellets.

Conclusions These data reveal the differences between populations of chondrogenic progenitors residing in different zones of human articular cartilage. Superficial zone clones have increased survival and propensity to form stable articular cartilage in vitro compared to deep zones clones. Differences seen in the matrix production at 20 population doublings are lost at 40 doublings and higher; this may be due to the survival of only higher matrix-producing clones from the deep zone with increased doublings.