The Role Of Gender In The Association Between Obesity And Atopic Disease In Urban Children

Rationale: The role of gender remains understudied in the relationship between obesity and atopy, particularly in urban children. The aim of this study was to examine if gender modified the association between obesity and multiple atopic diseases.

Methods: A retrospective cohort study was conducted on 113 children (aged 0-21) in an urban university hospital. Patients were evaluated for a history of allergic rhinitis, eczema, asthma, food allergies and IgE, eosinophil% and counts. An atopic score variable was created to summate the total number of atopic diseases per patient. Chi-square tests, t-tests and linear regression assessed the relationship between obesity and individual atopic disease variables as well as cumulative atopic score. Interaction effects were tested by gender.

Results: In our population, 23% was obese, 45% were female and 55% male. The most common atopic diseases were allergic rhinitis (67% vs. 23, p&lt;0.001) and food allergies (54% vs. 36%, p=0.02). We found no differences in laboratory biomarkers and individual/cumulative atopic disease prevalence in obese children compared to controls, but stratification by gender proved that obese females had a higher mean atopic disease score (4.00 vs. 2.62, p&lt;0.001) compared to controls. Interestingly, obese males had a lower atopic disease score (3.00 vs. 3.42, p&lt;0.001) compared to controls. Finally, regression models showed obese females showed a significantly higher mean atopic disease score (β = +1.37, p=0.005) compared to controls, whereas obese males were protected (β = -0.42, p=0.006).

Conclusions: This study shows that obesity and atopy were modified strongly by the interaction effects of gender, using an urban, representative dataset of US children. These results suggest the need for continued surveillance of the atopy-obesity relationship, particularly in urban females, in whom weight reduction therapies may be more beneficial than males in controlling symptoms of atopy.

Body Mass Index Correlates With Total Serum IgE Levels In Healthy Adults And Those With Allergy/Asthma

Rationale: Obesity is associated with increased Th1 responses in adipose tissue and Th2 responses in peripheral blood. We determined the relationship of body mass index (BMI) to total serum IgE levels.

Methods: Blood levels of total serum IgE levels were measured (IU/ml, fluoroenzymeimmunoassay) and BMI (kg/m2 ) determined for 31 adults (16 female, 13 with allergy/asthma and 18 healthy control subjects, mean age 38.8 yrs Â±14.0). Spearman correlations were determined.

Results:There is a significant association of BMI with total serum IgE level (R=0.47, p=0.007) for the entire group.

Conclusions: The immune responses of obesity are associated with IgE production and may contribute to allergy/asthma in adults.
Effect Of Sleep Duration On Levels Of Exhaled Nitric Oxide From Adults With Asthma

Rationale: The daily pattern of allergic asthma disease severity involves exacerbation in the overnight period. As increased nocturnal asthma activity may affect sleep, we determined the association of sleep duration with morning and afternoon exhaled nitric oxide levels.

Methods: Exhaled nitric oxide (eNO) levels (Niox Vero, Aerocrine) were measured for adult asthmatics (n=6) and healthy controls (n=8) at 10 AM and 4 PM. Sleep duration for the previous night was recorded. Spearman correlation coefficients were generated.

Results: Median duration of sleep was 6.6 hrs (min 4.0, max 8.3). Median eNO level in AM was 23.0 ppb (min 8.0, max 81.0); median eNO in PM was 21.0 ppb (min 7.0, max 82.0). There was a significant inverse relationship between sleep duration and AM eNO (R= - 0.65, p= 0.02) and near significance for PM eNO (R = - 0.57, p = 0.06).

Conclusions: Increased duration of sleep is associated with lower airway levels of nitric oxide, both in the morning and afternoon, in both adults with asthma as well as healthy controls. This suggests sleep may suppress airway inflammation.

Case Report: Anesthetic Management Of A Patient With Robinow Syndrome

Case Report: Anesthetic management of a pediatric patient with Robinow syndrome

Abstract: A nine year old boy presented for elective surgery for bilateral myringotomy tube placement and lingual frenulectomy. Medical history was significant for suspected Robinow syndrome, a syndrome of skeletal dysplasia which generally consists of disproportionate dwarfism, characteristic limb abnormalities and craniofacial abnormalities, and may include cardiac, renal, and spinal abnormalities as well. We discuss our care of this patient and the various preoperative, intraoperative, and postoperative considerations for anesthesia in patients with Robinow syndrome.
A Case Report Of Posterior Reversible Encephalopathy Syndrome In A Postpartum Patient

Posterior Reversible Encephalopathy Syndrome (PRES), otherwise known as reversible posterior leukoencephalopathy syndrome (RPLS) or reversible posterior cerebral edema syndrome is a syndrome with variable presentation but is generally characterized by headache, altered mental status, seizures, and visual disturbances. Its occurrence is rare in both the postpartum period and in normotensive patients. Although the exact mechanism is not known, it is believed to be due to impaired cerebral autoregulation leading to vasogenic edema. There are a number of conditions associated with developing PRES including hypertension, eclampsia/pre-eclampsia, immunosuppression, sepsis, and renal insufficiency. We will present a rare case report of a patient diagnosed with PRES in the immediate postpartum period. The patient presented with tonic-clonic seizures two hours postpartum, and had both clinical and neuroimaging consistent of PRES. Most authorities agree that PRES is caused by a disrupted cerebral autoregulation, which leads to cerebral vasogenic edema due to abnormal blood flow. Our patient was treated with Dilantin for a short time and made a complete recovery. The management of PRES involves seizure control, hypertension control, and control of the control of the underlying etiology. PRES should be suspected in any post-partum patient who develops cognitive decline and seizures.

Looking At The Effect Of Bimanual Intensive Therapy And Constraint-Induced Movement Therapy On The Improvement Of Hand Function And Cortical Motor Pathways In Children With Cerebral Palsy

Introduction: Unilateral Spastic Cerebral Palsy (USCP) is caused by damage to the developing brain within the first 2 years of life and results in weakness and motor deficits on one side of the body. This is an observational study that is an add-on to an Intensive Upper Extremity Summer Program at Blythedale Children's Hospital in Valhalla, NY. At Blythedale Children's Hospital children with USCP receive hand training therapy for 6h/day for 5 days a week for six weeks. Intensive Bimanual Therapy and Constraint-Induced Movement Therapy (CIMT) are two forms of upper extremity rehabilitation that have been shown to improve hand function in children with USCP. The purpose of this study is to determine the effect of bimanual training and CIMT on the motor cortex excitability and the improvement in hand function in children with USCP.

Methods: Case study examines a 6-year-old boy with congenital USCP enrolled in the Blythedale Children's Hospital Intensive Upper Extremity Summer Program. TMS (Transcranial Magnetic Stimulation) Motor Mapping. TMS Motor Maps were made with single-pulse TMS given to a region of the motor cortex to evoke movements of selected digit and wrist muscles of the hemiplegic hand. Motor responses were measured with surface electromyography. Improvements in hand function were measured using: Jebsen-Taylor Test of Hand Function (JTTHF), Fugl-Meyer Assessment, and Canadian Occupational Performance Measure.

Results/Conclusion: The patient showed improvements in hand function and changes in motor cortex mapping over the course of the summer program. The JTTHF reveals improvement in speed in accomplishing timed tasks over the course of camp. The Fugl Meyer Assessment of affected hand reveals some motor recovery between pre-camp and post-camp performance. The Canadian Occupational Performance Measure reveals that the individual's performance and satisfaction in functional goals have increased, clinically significant in 4 of 5 functional goals.
Comparison Of Physician Preference Of Novel Oral Anticoagulant Vs. Warfarin To Actual Prescription Choice

Although novel oral anticoagulants (NOACs) serve as an effective alternative to warfarin for oral anticoagulation (AC), AC management strategies remain highly variable. The purpose of this study is to assess physician preference towards NOACs vs. warfarin and identify factors related to selection of therapy.

Attending and housestaff physicians across multiple subspecialties at SUNY Downstate were surveyed online using 5 clinical scenarios: bleeding history, increased fall risk, CKD, and polypharmacy. For each scenario physicians rated their preference of AC on a Likert scale of 1-5 (1=strong preference for warfarin, 3=neutral, 5=strong preference for NOAC). For each physician, scores were averaged to derive an overall preference score (PS). PS >3 indicated preference for NOACs and <3 for warfarin preference. Chart review was done on patients discharged on AC examining (1) the class of oral AC used and (2) the presence of the clinical conditions above. Results were analyzed to determine concordance between survey responses and actual AC prescribed.

Among 70 survey responses, the mean PS was 3.6, p<0.05 indicating favorability for NOACS. Mean attending PS was higher than housestaff (3.9 +0.6 vs. 3.5 +0.6, p=0.006). There was a trend towards higher PS in EM than in IM and Neurology physicians (3.6 vs. 3.5 vs. 3.5, p=0.065). Mean PS was significantly lower in the setting of increased fall risk (2.7, p<0.001) and CKD (2.9, p<0.002) and significantly higher in the setting of bleeding history (3.7, p=0.03) than in other clinical conditions. Actual patient chart review revealed lower rates of NOAC prescribed in patients with CKD and increased fall risk compared to others (38% vs. 40% vs. 61%). Overall, NOACs are preferred over warfarin for AC. Attendings show stronger preference towards NOACs than housestaff. A preference for NOACs may be specialty related. Increased fall risk and CKD are each associated with lower PS and lower actual NOAC prescribing.

Fractal Analysis Of Coronary Angiograms In Patients With Eccentric And Concentric Left Ventricular Hypertrophy

Fractal dimensions are a measure of the self similarity possessed by a fractal and part of the larger branch of geometry called fractal analysis. Fractals are defined as structures that demonstrate repeated patterns of self similarity over progressively smaller scales. There have been studies done recently which look at the relationship between fractal dimensions and retinal vessels. Abnormally high and low fractal dimensions were correlated with increased 14 year CHD mortality. In this study, the fractal dimensions from coronary angiograms of 36 patients with eccentric or concentric left ventricular hypertrophy were computed and analyzed. The coronary angiogram images were enhanced for better clarity using Image J and GIMP programs prior to calculating the fractal dimension. It was found that the mean left coronary artery fractal dimensions were 1.5142±0.0296 and mean right coronary artery dimensions were 1.4765±0.0495. Fractal dimensions for the 2 arteries were not significantly correlated. Fractal dimension was indirectly correlated with pulse wave velocity, a direct measure of arterial stiffness for both the RCA and LCA. The significance of these findings as well as longitudinal changes in fractal dimensions merit further study.
Jesse Kane
Advisor(s): Jason Lazar

Mean Platelet Volume In Congestive Heart Failure At Baseline And During Acute Decompensated Heart Failure

Mean platelet volume (MPV) is routinely reported along with platelet counts. Younger platelets are larger and more thrombogenic. Earlier studies have suggested higher MPV is predictive of cardiovascular events. Limited studies show that during acute decompensated heart failure (ADHF), higher MPV levels are associated with higher BNP levels and greater 6 month mortality. Less is known about stable outpatients and MPV changes in ADHF. The objective of this study was to compare outpatient to inpatient MPV levels in CHF patients. We retrospectively studied 46 patients admitted for ADHF with MPV determined either before or after admission while stable in the outpatient setting (baseline). Clinical, and laboratory data were obtained from electronic medical record. Same hospital 180-day readmission rates were determined. Mean age was 70±13 years. Mean ejection fraction was 36±18%. Mean platelet count was 204±85 10^3/uL at baseline vs. 223±10010^3/uL upon admission (p=.16). Mean MPV was 8.5±1.0 fL at baseline vs 8.4±.90 fL on admission (p=.75). At baseline, 15% of patients had abnormally low MPV values (<7.5 fL), 85% had normal and none had high values (>11.5 fL). MPV significantly increased in patients with low MPV at baseline by 0.7±.8 (p=.034). Absolute changes in MPV were inversely correlated to baseline MPV values (r=-.49, p<.01). Patients with low MPV at baseline had fewer days to same hospital readmission (55±46 vs 10±23 days, p=0.01). In conclusion, 15% of stable ambulatory CHF patients have abnormally low MPV values suggesting impaired production rather than increased destruction. These patients are more likely to exhibit an increase in MPV during ADHF suggesting increased release as an acute response. Therefore differing mechanisms may govern platelet production/release may in the stable outpatient and acute inpatient settings. While prior studies have found high MPV values during ADHF, our findings suggest lower values in chronic stable patients.

Venu Pasricha
Advisor(s): Jason Lazar

Nailfold Capillaroscopy For The Identification Of Microvascular Disease In African-Americans

Background: Nailfold video capillaroscopy (NFC) is a non-invasive imaging technique that is used clinically in the rheumatology arena in order to directly visualize capillaries for the identification of microvascular abnormalities related to systemic sclerosis. More recently, this technique has been performed to assess microvascular involvement in non-rheumatic conditions such as arterial hypertension, diabetes mellitus, acromegaly, hyperthyroidism, Syndrome X. Although African Americans (AA) are particularly susceptible to hypertensive related microvascular target organ damage, NFC has not been studied in this setting. Accordingly, the objective of this study was to characterize subclinical microvascular structural abnormalities in AA with hypertension (HTN).

Methods: We studied 40 AA controls and 38 AA HTN subjects, of which 14 also had diabetes (DM). NFC was performed 3-4x on each of 8 digits using a capillaroscope and recorded digitally for off-line analysis. Images were reviewed by a blinded observer according to previously published criteria and mean capillary number and final capillary score (indirectly related to capillary number) were calculated and averaged for each subject.

Results: The HTN groups was significantly older, had higher body mass index (BMI) and higher systolic and diastolic blood pressures (all p<.002). On NFC, the mean capillary number was lower (7.1 ± 1.4 vs 7.6 ± 2.4 vs 8.8 ± 1.4, p=.003) and the final capillary score was higher in the HTN-DM and the HTN groups (.35±.48 vs 1.13 ± .95 vs 1.2 1± .70, p=.01) as compared to controls. On multivariate linear analyses, both mean capillary number and final capillary score were independently related to HTN after adjusting for age, BMI, and mean arterial pressure (both p<.02).

Conclusions: HTN is associated with lower capillary density in AA with HTN. The relation between capillary density and other markers of target organ disease merits further study.
Relation Between Nail-Fold Capillary Density And Microvascular Reserve In African Americans

Objectives: African Americans (AA) are prone to develop diabetic (DM) and hypertensive microvasculopathy. Measures of microvascular abnormalities are lacking. Nailfold videocapillaroscopy (NFC) is used to visualize capillaries when systemic sclerosis is suspected, and recently in studies to assess microvascular involvement in hypertension (HTN) and DM. The relation between capillary density and functional microvascular derangements is unknown. Our objective was to determine the relation between nailfold capillary density and microvascular flow reserve using Laser Doppler Flowmetry (LDF).

Methods: We studied 123 AA subjects (21% with HTN, 18% with DM, 25% with both HTN and DM). NFC was recorded for 8 fingers. Mean capillary number and final capillary score (degree of capillary drop out) were calculated. LDF was performed on the hand to record flux, a measure of microvascular flow (Periflux 5000), both pre and post reactive hyperemia induced by inflation of a Hokenson's cuff around the upper arm above systolic blood pressure with subsequent release. The percent increase in flux was calculated.

Results: NFC was interpretable in 118/123 subjects and LDF was feasible in 116. The HTN and DM groups were older, with higher body mass index and higher blood pressure (all p<.05). Mean capillary number was significantly lower and the final capillary score was higher in the HTN, DM and HTN-DM groups as compared to control. Percent change in flux correlated with mean capillary number (r=.26, p=.005) and inversely with final capillary score (r=-.29, p=.002). These relations persisted after adjusting for confounding variables on multivariate linear analyses.

Conclusion: HTN and DM are associated with subclinical abnormalities of microvascular structure and function in AA. Reduced nailfold capillary density is associated with lower microvascular flow reserve in AA. The relation between capillary density, microvascular flow reserve and target organ disease merits further study.

Relation Between Aging And Cardiovascular Risk Factors With Spinal Cord Size: A Pilot Study

Aging and the presence of cardiovascular (CV) risk factors have been found associated with decreased brain volume and cognitive dysfunction. However, less is known about their relationships to the other central nervous system component, the spinal cord (SC). This pilot study tests the hypothesis that age and CV risk factors are associated with lower SC volume and higher frailty. We recruited and prospectively studied 18 subjects, age 30-69 years. CV risk factors were: hypertension in 8, diabetes in 10, 10 with hyperlipidemia and 10 were former or current smokers. Two participants had CAD. Each subject underwent assessment of CV risk factors, standardized frailty testing, and cervical spine magnetic resonance imaging (MRI) to determine SC area from multiple axial images from C2 to C7. 13 participants were not frail (0 indicators), 5 were pre-frail (1-2 indicators) and 1 was frail (≥3 indicators). Mean SC area was 67.5±12.7mm² and the range was 35.0–85.4mm². For the group, mean SC area was significantly correlated with age (r=-0.52, p = 0.027) and there was a trend with pooled cohort risk score (10-year CV event risk) (r = -0.38, p = 0.12). There were no significant correlations between mean SC area and height, weight or body mass index. There was a trend towards lower mean SC area in subjects with 3-4 risk factors than in those with 0-2 risk factors 63.0 ±4.0 vs 73.2 ±4.2mm², (p=0.10) and in the pre-frail/frail group as compared to the non-frail group 60.1±5.4 vs 70.9 ± 3.2mm² (p=.09). This pilot study suggests that advancing age and higher CV risk may be associated with lower SC volume, which in turn may predispose to the frailty syndrome. It supports the rationale for additional larger studies to evaluate these associations.
First Report Of Hemopericardium Resulting In Multi-Organ Failure As A Consequence Of Dabigatran Use Reversed By New Antidote Idarucizumab

Dabigatran, the first novel oral anticoagulant (NOAC) with a reversal agent, heralded a paradigm shift in the treatment of non-valvular atrial fibrillation. The potential for life-threatening hemorrhagic events with the use of NOACs has been highly debated since the effectiveness of reversal agents such as Idarucizumab are based primarily on pharmacologic data. It is known that cancer patients are at an increased risk of bleeding with anticoagulation, though specific studies demonstrating the risks or efficacy of NOACs in this population are lacking. We provide the first report of hemopericardium resulting in multi-organ failure secondary to Dabigatran that was successfully reversed by Idarucizumab.

An 84-year-old man with prostate cancer and atrial fibrillation was admitted for neutropenic fever and kidney failure. He received fluid resuscitation and broad-spectrum antibiotics without improvement. Within 24 hours, his condition progressed to cardiogenic shock and multi-organ failure. Echocardiography revealed a large pericardial effusion with evidence of cardiac tamponade. Idarucizumab was administered facilitating pericardiocentesis of hemorrhagic fluid. He returned to baseline functional status within 1 week.

This patient’s presentation was compounded by his malignancy and chemotherapeutic regimen, docetaxel and enzalutamide, both P-glycoprotein modulators that increase the plasma level of Dabigatran. This case underscores the importance of critical appraisal of a patient’s comorbidities and drug interactions if prescribing a NOAC. Given the lower threshold for catastrophic bleeding in cancer patients on treatment with chemotherapy and additionally requiring anticoagulation, physicians should carefully select those for NOAC prescription until evidenced based practice guidelines have been established. In the meantime, the real-world effectiveness of Idarucizumab for neutralizing Dabigatran in life-threatening hemopericardium has been reported for the first time.

Relationship Of Body Mass Index With Outcomes After Transcatheter Aortic Valve Replacement: Results From The National Cardiovascular Data- Sts/Acc Tvt Registry

Objective: To investigate the relationship of body mass index (BMI) with short and long term outcomes after Transcatheter Aortic Valve Replacement (TAVR).

Methods: Patients who underwent TAVR between November 2011 and March 2015 from STS/ACC TVT Registry were included in the analysis. Registry data on 20,429 patients were linked to the Centers for Medicare and Medicaid Services to assess the association of BMI with 30-day and 1-year mortality using multivariable Cox proportional hazards modeling.

Results: Among 31,929 patients, 2.5% (n=806) were underweight; 33.7% (n=10755) normal weight; 33.5% (n=10691) overweight; 17.5% (n=5582) class I obese; 7.4% (n=2363) class II obese; and 5.4% (n=1732) class III obese. On multivariable analysis, compared to normal weight patients, underweight patients had an increased risk of mortality at 30 days and 1 year after TAVR [1.35 (1.02-1.78) and 1.41 (1.17-1.69), respectively] whereas overweight, obese class I and II patients had a decreased risk of mortality at 1 year [0.88 (0.81-0.95), 0.80 (0.72-0.89), and 0.84 (0.72-0.98), respectively]. Patients with BMI ≤ 30 kg/m2, each 1 kg/m2 increase was associated with 2% and 4% decreases in the risk of 30-day and 1-year mortality, respectively. Further, for patients with BMI > 30 kg/m2, each 1 kg/m2 increase was associated with a 3% increased risk of 30-day mortality, and a statistically non-significant trend for an increase in the risk of 1-year mortality.

Conclusion: Results of this largest study support existence of an "obesity paradox" among patients with severe aortic stenosis undergoing TAVR.
Sonam Verma

A Rare Phenotypic Presentation Of Epileptic Encephalopathy And Pontine/Cerebellar Hypoplasia In A Male Due To Cask Gene Mutation

Introduction
X-linked CASK gene mutations are found in female patients with a severe neurodevelopmental disorders and distinct brain anomalies which comprises of progressive microcephaly, ponto-cerebellar hypoplasia and severe developmental delay, (MICPCH). Females with MICPCH carry heterozygous loss-of-function mutations in CASK gene. It has been hypothesized that CASK loss-of-function mutations are associated with reduced male viability or in utero lethality while hypomorphic mutations are associated with a different phenotypic spectrum.

Case report
We here report a case of a 6 month old Chinese boy, born full term to nonconsanguineous parents who presents with intractable epilepsy since two weeks of age, microcephaly, hypotonia, severe global developmental delay, dysmorphic features and optic nerve dysplasia. He feeds through PEG tube. His vEEG is diagnostic of Ohtahara syndrome. MRI brain showed lissencephaly, in addition to pontine/cerebellar hypoplasia. Whole exome sequencing showed likely pathogenic hemizygous splice variant in CASK(c.1669-2T>C) between axons 17 and 18, which has not been previously reported in the literature.

Discussion
Including our patient, there are eleven sporadic male individuals with MICPCH and severe epileptic encephalopathy who have been reported in the literature up to 2017. CASK alterations in these patients likely represent germline mutations (missense mutation, nonsense mutation, splice site mutation). In this group, the affected males have the most severe clinical presentation with profound developmental delay and intractable epilepsies such as Ohtahara syndrome or Early Myoclonic Epilepsy of Infancy. MRI shows significant pontocerebellar hypoplasia. Other brain malformations can include rarefication of gyri, cortical atrophy and hypomyelination but no further supratentorial involvement is usually observed. Thus, the brain imaging findings are the major diagnostic clue and should prompt testing of the CASK gene.

Hoang Tang

The Changing Sexual Health Risk Behaviors In Men With And Without HIV As They Age

Objective: To identify predictors of unsafe sex practices within the urban-Black community and to identify differences in risk factors between older and younger men with and without HIV.

Methods: Patients were recruited for this study from University Hospital of Brooklyn and King's County Hospital Center. Audio Computer-Assisted Self-Interview was used to collect data on patient health status, HIV knowledge and risk perceptions, sexual behaviors, social networks, stigma, and psychological resources. Additional information was collected using focus groups and in-depth interviews for select patients.

Results: 193 subjects were recruited for this study. The mean age was 46.8 years (range 20-80). 113 (58.6%) identified as heterosexual, 19 (9.8%) as bisexual, 58 (30.1%) as homosexual, and 3 (1.5%) as other. 169 (87.6% ) identified as Black, African American, or Caribbean, 38 (19.7%) identified as Latino(a), 17 (8.9%) identified as other, and 7 (3.6%) identified as White or Caucasian. 138 (71.5%) were HIV+, 53 (27.5%) HIV-, and 2 (1.0%) didn't know their status/NA. Participants were separated into 4 groups based on HIV status and age. The rates for condomless sex were: 29.0% for those ≥ 50 and HIV+, 44.8% for those ≥ 50 and HIV-, 57.9% in those < 50 and HIV+, and 66.7% in those < 50 and HIV-. Condomless sex was associated with having multiple sexual partners, diagnosis of an STI within the last 6 months, and sex while using drugs or alcohol.

Discussion: In order to plan effective interventions for at risk populations we must first identify the main determinants that lead individuals to engage in high-risk sexual behaviors which include psychological processes, socioeconomic factors, and the dynamics of sexual interactions. On the basis of the results of this study we plan to propose evidence based behavioral intervention strategies to reduce sexual risk behaviors in priority populations.
Challenging Diagnosis: Anti-Nmda-Receptor Encephalitis With Subsequent Discovery Of An Ovarian Teratoma

Background: Anti-N-Methyl-d-aspartate receptor (NMDAR) encephalitis is an under-recognized condition in the pediatric population. It carries a high mortality rate if not treated promptly. Clinicians need a high index of suspicion to prevent poor outcomes.

Case: A 14-year-old presented with 1-day history of confusion, agitation, memory loss, auditory and visual hallucinations. It was preceded by 10 days of tactile fever, vomiting, diarrhea and severe headache with photophobia and phonohobia. Urine toxicology screening, CBC, CMP, LP and head CT were normal. She worsened the next day with altered sensorium and subsequently intubated due to bradycardia and desaturations. She also developed autonomic instability (hyperthermia and hypertension) and dyskinesia. With the constellation of signs and symptoms, NMDAR encephalitis was highly suspected. Repeat LP on day 5 of admission revealed elevated lymphocytes and WBC. Pelvic US and CT were normal (no ovarian mass). She was started on solumedrol and IVIG treatment empirically. CSF NMDAR Ab was reported on day 14 of hospitalization as positive and diagnosis of Anti-NMDAR encephalitis was made. Since she did not respond as expected to the therapy, she received plasmapheresis, rituximab and cyclophosphamide. Her condition continued to deteriorate even after the second line therapy for which a pelvic US was repeated (4 weeks after the initial one) and showed a 1 cm mass in the left ovary. Two benign teratomas were found on exploratory laparotomy which required cystectomies. Her condition improved after surgery. She recovered few years later.

Conclusion: This unique case demonstrates the importance of clinicians to be aware of this condition as it deteriorates rapidly and with early therapy, it has proven to have better cognitive outcome. It also highlights the need to closely follow up the radiological images on those patients with positive anti-NDMA antibodies-encephalitis in which the initial radiologic work up was negative.

New Energy Devices For Neck Rejuvenation: Review Of Modalities And Efficacy

Rationale: During aging, the neck develops skin dyspigmentation, rhytides, loss of mandibular contour and prominence of platysmal bands. We review the latest data on efficacy of assorted energy devices.

Methods: Novel publications from 2014-2016 on neck rejuvenation technologies were reviewed. This revealed a surge of new technologies which include ablative and non-ablative lasers, radiofrequency devices, photodynamic therapy (PDT), and combination therapies.

Results: One prospective study of non-ablative fractionated laser resurfacing in 18 women found immediate improvement in skin dyschromia, laxity, and wrinkles; however, re-evaluation at 3-months only showed sustained improvement in dyschromia and wrinkles. Another study evaluated long-term efficacy of fractional CO2 laser utilizing blinded reviewers. Participants had significant improvement in skin laxity, jowls, fat deposition, and horizontal neck lines both one-month and one-year post-treatment. In regards to PDT, a comparison study evaluated intense pulse light (IPL) and red light energy with and without PDT. The neck was divided into four equal sections and treated with a different combination therapy. The IPL-PDT and red light-PDT groups had better efficacy than IPL or red light alone.

Discussion: The studies display improvement in skin laxity, dyschromia, and rhytides for neck rejuvenation. For photodamage and dyschromia, it is the author’s opinion that non-ablative fractionated lasers prove more efficacious clinically when compared to photodynamic therapies. With skin laxity and submental fullness, current laser studies support superior outcome for CO2 laser but with more downtime and need for expert clinicians. The best cosmetic outcomes are lasers used in combination with a secondary treatment modality (neuronmodulators, cryolipolysis, liposuction). This is an exciting new era for neck rejuvenation. As physicians continue to mix and match treatment modalities, more research can be expected.
A Rare Cause Of Collodian Membrane And Neurological Deficits In A Newborn

Rationale: Lipid storage diseases are a group of uncommon metabolic disorders that cause significant debilitation with a high risk of death in infancy. Commonly, these disorders have been associated with the Ashkenazi Jewish population. We present a rare form of lipid storage disease that causes significant dermatological and neurological deficits in a differing sub-population.

Description: A Middle Eastern baby boy whose parents are first cousins was delivered at 37 weeks gestation with a thick collodian membrane encasing his body. Dermatology was consulted for concern that the membrane was causing compression to the left hand. Examination and ultrasound Doppler of the extremities deemed him clear of any vascular compromise. At three days of life, the collodian membrane began to fissure eventually exfoliating off. Concerned for a congenital ichthyotic disorder, genetic testing was offered.

At 8 months, the genetics result was available. At which time, significant neurological deficits were noted on examination. The infant was unable to roll over nor could he sit in the seated position. He had severe nystagmus bilaterally. The skin was erythematous with fine white scale throughout the body and large ichthyotic plaques on the lower legs.

Results: Genetic analysis revealed a mutation in the Abhydrolase Domain Containing-5 (ABHD-5) gene. This mutation leads to a rare lipid storage disease: Chanarin-Dorfman Syndrome.

Discussion: The ABHD-5 gene provides instruction for breaking down triglycerides. When mutated, triglycerides accumulate throughout the body leading to lipid storage disease. Chanarin-Dorfman Syndrome is a rare autosomal recessive condition seen in the consanguous Middle Eastern populous. Patients develop generalized ichthyosis, myopathy, cataracts, sensorineural deafness, developmental delay, hepatomegaly and a collodian membrane. Diagnosis can be made with peripheral blood smear which displays vacuolated leukocytes and confirmed with genetic testing.

Diagnostic Accuracy Of History, Physical Exam, Laboratory Tests And Point-Of-Care-Ultrasound For Pediatric Acute Appendicitis In The Emergency Department: A Systematic Review And Meta-Analysis

We performed a systematic review/meta-analysis to determine the utility of history, physical exam, lab tests, Pediatric Appendicitis Score (PAS) and Emergency Department-Point-of-Care Ultrasound (ED-POCUS) in the diagnosis of Acute Appendicitis (AA) in ED pediatric patients. PUBMED, EMBASE, and SCOPUS were searched up to October 2016. Quality Assessment Tool for Diagnostic Accuracy Studies (QUADAS-2) for Quality assessment. Positive and negative Likelihood Ratios (LR+ and LR-) were calculated and when appropriate data was pooled. Using the test characteristics of different imaging modalities and applying Pauker-Kassirer method we developed a test-treatment threshold model to identify diagnostic findings that could rule in/out AA and obviate the need for CT scan, MRI and Radiology-Department Ultrasound (RUS).

Twenty-one studies were included encompassing 8,605 patients with AA prevalence of 39.2%. We divided studies based on their inclusion criteria into 2 groups of "undifferentiated abdominal pain" and abdominal pain "suspected of AA". In patients with "undifferentiated abdominal pain" history of "pain migration to RLQ" (LR+ 4.81) and the presence of "cough/hop pain" in the physical exam (LR+ 7.64) were most strongly associated with AA. None of the history, physical exam, lab tests findings or PAS alone could rule in/out AA in neither group. ED-POCUS had LR+ 9.24 and LR- 0.17. Using our test-treatment threshold model, positive ED-POCUS could rule in AA without the use of CT and MRI, but negative ED-POCUS could not rule out AA.

Presence of AA is more likely in patients with undifferentiated abdominal pain migrating to the RLQ or when pain is reproducible with cough/hop. Once AA is suspected, no single history, physical exam, lab finding or PAS score can eliminate the need for imaging studies. In ED patients suspected of AA, a positive ED-POCUS is diagnostic and obviates the need for CT or MRI while negative ED-POCUS is not enough to rule out AA.
Protocolized Laboratory Screening For The Medical Clearance Of Psychiatric Patients In The Emergency Department: A Systematic Review

Emergency department (ED) patients with psychiatric chief complaints undergo medical screening to rule out underlying or comorbid medical illnesses prior to transfer to a psychiatric facility. This systematic review attempts to determine the clinical utility of protocolized laboratory screening for the streamlined medical clearance of ED psychiatric patients by determining the clinical significance of individual laboratory results. We defined clinical significance as abnormal laboratory results that altered patient treatment or disposition. We searched PUBMED, EMBASE and SCOPUS using the search terms “Emergency department, Psychiatry, Diagnostic tests, Laboratories, Studies, Testing, Screening, and Clearance” from January 1966-February 2017 for studies on adult psychiatric patients. This systematic review follows the recommendations of Meta-analysis of Observational Studies in Epidemiology (MOOSE) statement. The quality of each study was rated according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement. Four independent reviewers identified 2,847 publications. We extracted data from 3 studies (n=629 patients). Study quality ranged from low to moderate (33%-57% of satisfied items) using the STROBE checklist. Complete blood count had the highest weighted prevalence of clinically significant test results (0.4% (95%CI 0.25-0.55%)). To date, there is a paucity of published research on the utility of protocolized laboratory screening for ED psychiatric patients and the available literature is of low quality with a high risk of selection and abstraction bias. We cannot confirm whether or not laboratory screening is warranted for all ED psychiatric patients.

Clinical Value Of Initial Serum Lactate In Risk Stratifying Trauma Patients

Background: Emergency physicians face the challenge of rapidly identifying high-risk trauma patients, often with minimal data to guide them. Lactate (LAC) is widely used as a surrogate of tissue hypoperfusion. However, clinically important values for LAC as a predictor of mortality are not well defined. Objectives: 1. To assess the value of triage LAC in predicting mortality after trauma. 2. To compute interval likelihood ratios (LR) for LAC.

Methods: Retrospective, electronic chart review of trauma pts treated at a large, urban trauma center. Inclusion: All trauma pts with a significant mechanism of injury (MOI) that warranted triage labs. Outcome: In-hospital mortality. Data are presented as median and quartiles or percentages with 95% confidence intervals. Groups (lived vs. died) were compared with Man-Whitney-U or Fisherâ€™s exact tests. Multivariate analysis was used to measure the association of the independent variables (age, gender, MOI, intracranial hemorrhage, blood pressure, heart rate, venous LAC, base deficit) and mortality. The interval LRs were calculated for all LAC observed values.

Results: 10,575 pts; median age: 38 [25-57], 69% male; 76% blunt; 1.1% (n=119) mortality. LAC was statistically different between the groups (2.3 [1.6-3] vs 2.8 [1.6-4.8], p=0.008) and was associated with higher risk of mortality (OR: 1.14 [1.08-1.21], p=0.0001). LR revealed a range of 0.6-1.0 for LR-. Increasing LAC increased LR+. However, LR+ for LAC reached 5 (moderate increase in disease probability) with LAC &gt; 9mmol/L and LR+ passed 10 (conclusive increase in disease probability) with LAC &gt;18mmol/L.

Conclusions: In a cohort of trauma pts with a wide spectrum of characteristics (age, disease severity, MOI): 1. Triage LAC was statistically able to identify high-risk pts. However, meaningful contribution to decision-making (moderate increase in pre-test probability) occurred only at LAC &gt;9. 2. LAC was not useful at excluding those with a low risk of mortality.
A Retrospective Study Evaluating Cigarette Smoking And Right- Vs Left- Polyps And Colorectal Cancer In An Afro Caribbean Population

Background: Up to 20% of cases of colorectal cancer may be linked to smoking in the United States. Carcinogens from tobacco can cause damage to or alter the expression of cancer-related genes in the colorectal mucosa. Right- and left-sided colon cancers and adenomas differ clinically, epidemiologically and histologically, and thus the effect of cigarette smoking may also differ. We predict that right-sided adenocarcinomas are more common in this population and that smoking is associated with the presence of advanced adenomas.

Methods: A retrospective chart analysis of patients undergoing screening colonoscopy at our inner city hospital serving mainly an Afro-Caribbean population from January 2010 to December 2011 was performed. Data was collected on demographics, personal and family history, polyp characteristics and bowel prep. Only patients with good bowel prep were included and those with a family history of malignancies were excluded. Data was analyzed using chi-square analysis.

Results: 2,510 patients were reviewed. 40% had polyps or cancer. 53% were lifetime non-smokers, 6.4% were active smokers and 8.6% of were former smokers. 31% had no smoking status documented. 26.9% of smokers had a right-sided colon polyp compared with 20.9% of non-smokers. There was a statistically significant association between smoking and right colon polyps but not between right-sided polyps and advanced histology. 36.2% of patients with left-sided polyps were active smokers. 1.3% of smokers had a left-sided adenocarcinoma compared to 0.7% of non-smokers and 2.8% of former smokers. 73% of the adenocarcinomas were located within the right colon.

Conclusion: Smoking is correlated with the increased prevalence of both right-sided and left-sided polyps. It is also associated with the presence of advanced adenomas and adenocarcinoma within the left-colon. Based on this data we recommend that active or former smokers undergo screening at an earlier age.

Longitudinal Pilot Study Of Continuous Feedback To Improve Student Patient Note Writing Skills

Changes in medical practice have greatly affected interactions between students, residents and faculty and has led to variability in teaching within clerkships. As a result the AAMC released the Entrustable Professional Activities (EPAs) to evaluate medical students. Progress note writing is one of the main EPA's; we created a program to improve this student skill. This project quantitatively assessed improvement in students’ daily progress notes following three weeks of continuous feedback.

Students rotating on the General Surgery service at were given an introductory lecture on basics of patient note writing. They were then asked to write electronic daily progress notes for patients they assessed during pre-rounds and rounds. During the course of three weeks, students received anonymous, ungraded feedback on their notes provided by two trained residents on a continuous basis, approximately twice per week. To assess the progress notes we used the Patient Note Scoring rubric developed by UICCOM. The rubric consists for three categories 1) Documentation 2) Differential Diagnosis and 3) Workup. A score of 1-4 was given for each category and weighted to total score of 100 (Documentation 30%, Differential Diagnosis 60% and Work-up 10%). The rubric was used to grade the first note as a baseline. The same scoring system was used to grade the last note to assess effects of the intervention. The scoring was done in a by two independent blinded graders to assess all student notes.

39 students participated in the project. We found an avg improvement of 4.6, and 1 points(p 0.00008, 0.0003, and 0.006) for documentation, differential diagnosis and workup respectively. The total grade improvement avg 10 points(p <0.0001). We had mixture of third and fourth year students with no significant difference in improvement between school year. Our pilot program of continuous feedback proved successful in improving patient note writing skills for both third and fourth year students.
Emergent Presentation Of Colorectal Cancer In At Risk Populations: A Safety Net Hospital Experience

Introduction: Colorectal cancer is the second leading cause of cancer related deaths in the US. African Americans have a greater incidence, higher mortality rate and are more likely to present at an advanced stage when compared to their white counterparts. We explored the difference in African American and Caribbean born (Afro-Caribbean) patients that underwent surgery for colorectal cancer at two urban safety-net hospitals.

Methods: We conducted a retrospective chart review of patients that underwent resection for colorectal cancer from 2007-2015. Patients were stratified by race and country of birth; 119 African American and 203 Afro-Caribbean patients were identified. We then compared rates of disease presentation requiring urgent or emergent surgical intervention and rates of presentation allowing for elective procedures. Emergent/urgent presentation was defined as surgical intervention to treat a tumor complication on the same hospital admission in which the diagnosis of colorectal cancer was made. Tumor complication rates between each group were also compared. Complications included obstruction, anemia requiring transfusion, colonic perforation and hemorrhage. Comparisons were performed using the Chi Square Test for emergent/urgent vs elective case presentations and the Fisher's Exact Test for tumor complication rates.

Results: There was no significant difference in the rate of urgent/emergent cases of colorectal cancer when compared to elective procedures. We identified 30 (25.2%) African American patients compared to 55 (27.1%) Afro-Caribbean patients that required an urgent/emergent procedure (p = 0.7912). African American compared to Afro-Caribbean patients had no statistically significant differences in the rate of obstruction (9.24% vs 9.85%, p = 1.0) hemorrhage (7.56% vs 5.42% p = 0.4778), and perforation (3.36% vs 2.96% p = 1.0). However Afro-Caribbean patients were more likely to present with anemia requiring transfusion (7.88% vs 1.68%, p = 0.022).

Can The Laparoscopic Approach Be Employed In Octogenarians? A Retrospective Review Using Acs Nsqip

Introduction: Laparoscopic surgery (LAP) is associated with decreased length of stay (LOS) and pain; however open exploration is often employed for small bowel obstruction (SBO). We compare differences in outcomes between LAP and open approach in octogenarian patients presenting with SBO from adhesions.

Methods: Using ACS NSQIP 2006-2014, we identified patients ≥80 years of age, undergoing emergency surgery ≤1 day of admission with postoperative diagnosis of adhesive SBO (ICD9 560.81). Risk variables included age, sex, race, BMI, preoperative sepsis, ASA classification, LOS, postoperative mortality and pneumonia. Univariable analysis and multivariable analysis were performed.

Results: There were 103 LAP and 692 open cases with no significant differences in age (p=0.1518), sex (p=0.7994), BMI (p=0.1151), or race (p=0.3722). The open group had higher ASA class (p=0.0225) and incidence of preoperative sepsis (p=0.01597). Unadjusted outcomes showed longer LOS (median 4.0 vs 8.0 days, p<0.0001), higher incidence of postoperative mortality (p=0.0071) and postoperative pneumonia (p=0.0032) in open vs LAP. On multivariable analysis age (OR:1.11, 95%CI:1.01-1.22, p=0.0311) and preoperative sepsis (OR:3.77, 95%CI:1.06-12.02, p=0.0287) were associated with increased risk of mortality. Male sex (OR:2.68, 95%CI:1.58-4.60, p=0.0003) and open procedure (OR:5.03, 95%CI:1.50-31.34, p=0.0282) were associated with developing pneumonia.

Conclusion: Age and presence of preoperative sepsis, but not procedure type, was associated with mortality while male sex and open approach was associated with increased risk of postoperative pneumonia. Therefore octogenarians who present with SBO from adhesive disease may benefit from an initial laparoscopic exploration. Further prospective studies are warranted.
Breast Reconstruction Rates In An Afro-Caribbean Population, Is Race Really A Factor?

Introduction: Breast reconstructive surgery has become an integral component in the management of breast cancer and can be performed either at the time of mastectomy or delayed until completion of adjuvant therapy. Analysis from two national databases, SEER and NSQIP, found breast reconstruction rates to be 30.1% and 38.3% respectively, with predominance in Caucasians and patients $\leq$40yrs. Given our predominant Afro-Caribbean patient population, we aimed to compare the rates of breast reconstruction at our institution to those in the general population.

Methods: We performed a retrospective analysis of all the patients that received a mastectomy from 2007-2014 at a single institution. We analyzed the rates and types of reconstructions in the population and sought to find factors leading to reconstructive surgery.

Results: A total of 177 patients (82% Afro-Caribbean) received mastectomy; 141 were diagnosed with IDC and 36 were diagnosed with DCIS. Patients that received reconstruction were found to be younger than patients who did not (DCIS: 54 y/o vs. 67 y/o; IDC: 51 y/o vs. 60 y/o). Patients with noninvasive breast cancer had reconstruction more often than patients with invasive cancer (DCIS: 64% vs. IDC: 39.7%). Of those with DCIS, implant reconstruction was more common than autologous flap reconstruction (65% vs. 18%). For patients with IDC, 62% were implants and 34% were flaps. 73% of patients receiving reconstruction had early stage breast cancer (stages 0-2) while only 58% of patients without reconstruction had stage 0-2 breast cancer.

Discussion: Comparison of our data to the national trend shows that in our patient population, which is predominantly Afro-Caribbean, significantly higher rates of breast reconstruction were performed. Secondary analysis suggests that age and aggressiveness of disease may influence the decision to pursue reconstruction. Further prospective, multi-institutional studies are needed to elucidate factors that lead to our findings.

Analysis Of Nationwide Trends And Outcomes Of Percutaneous Endoscopic Gastrostomy (Peg) Tube Placement In Hospitalized Cancer Patients Over A 13 Year Period.

Background: The decision to provide enteral feeding in cancer patients is complex and is based on the patientâ€™s preference, prognosis of the disease and the risks associated with surgery. Outcomes PEG tube placement in cancer patients have not been studied. We analyzed a nationwide database over a 13 year period.

Methods: Data was extracted from the Nationwide Inpatient Sample (NIS) from 2000 to 2012 using ICD-9-CM codes. NIS variables were used to identify in-hospital mortality, discharge dispositions. We also examined the admissions related to complications from PEG tube placement. Chi square test and Wilcoxon rank test were used.

Results: 2,325,603 hospitalized patients underwent PEG tube placement from 2000 to 2012. Of these, 465,049 (20%) were cancer patients. Of all cancer related admissions, 0.86% received PEG tube placement. The rate of PEG tube placement in cancer patients has gradually increased from 2000 to 2012 (p=0.007). The number of hospital admissions with PEG tube-related complications have increased from 6696 in 2000 to 9640 in 2012. The in-hospital mortality in non-cancer patients who received PEG tube was higher than in those who did not get PEG tube (9.85% vs. 8.05%, p=0.0000). Cancer patients who underwent PEG tube placement were discharged to nursing homes less often than non-cancer patients (47% vs. 80%, p$\leq$0.001).

Conclusions: The rates of PEG tube placement in cancer patients and related complications have increased in the last decade. The in-hospital mortality of non-cancer patients who received PEG tube placement was higher and these patients were discharged to nursing homes more often than cancer patients who received PEG tube placement. The decision to place PEG tube in cancer patients should be individualized taking into consideration the effect of possible PEG tube-related complications, availability of support systems, prognosis of the underlying malignancy and the desired quality of life.
Karan Josan  Advisor(s): Iuliana Shapira

**Disparities In Outcomes In Metastatic Cancer Patients Who Develop Spinal Cord Compression.**

Background: The outcomes of metastatic spinal cord compression (MSCC) are often dependent on the provision of appropriate interventions in a timely manner. A database with nationwide representation was utilized to examine the outcomes of hospitalization in these patients over a 12-year period.

Methods: Nationwide Inpatient Sample (NIS) from 2000 to 2011 was utilized to extract data for all in-hospital stays of patients with MSCC using ICD-9-CM codes. Outcomes in terms of mortality and morbidity with respect to gender, age and race were examined. These interventions were defined as "early intervention" if they were provided within the first 48 hours of hospitalization.

Results: 13,457 patients were admitted with MSCC from 2000 to 2011 who received one or more modalities of treatment. Of these, 5035 (37%) received early intervention. The percent of patients receiving early intervention has not changed significantly from 2000 to 2011 (p=0.15). Female gender, private for-profit hospitals and higher co-morbidity index were associated with lower use of early intervention. Female patients with MSCC had 0.77 times lower odds (95% CI 0.66 to 0.91) for receiving early intervention. Race, payer status, hospital teaching status and hospital size did not appear to be associated with provision of early intervention. In-hospital mortality was lower in the early intervention group (5.0% vs. 6.9%, p=0.04). The LOS was significantly shorter and hospital charges lower in those who received early intervention (LOS: median 6 days vs. 11 days, p<0.001) (charges: $34,354 vs $50,062; p<0.001).

Conclusions: Female gender was noted to be a risk factor for suboptimal care delivery by early intervention in MSCC. The etiology of this disparity is unclear and warrants further investigation. This is particularly relevant since most cases MSCC are seen in prostate cancer in men and healthcare providers may be sensitized to its prevalence in men.

Tyion Torres  Advisor(s): Iuliana Shapira

**Persistent Disparity In Mortality In Geriatric Female Patients With Lung Cancer In Us.**

Background: Lung cancer is the leading cause of death due to cancer and accounts for more than 1 in 4 cancer deaths. Improvements in healthcare delivery and therapeutic advances have resulted in a significant increase in geriatric patients in the US population. However, it is unclear if these advances have reduced the mortality of lung cancer patients across different races, age groups and gender to the same extent. We have analyzed the SEER database which has a nationwide representation for race-specific and gender-specific mortality in lung cancer patients over a 14 year period (2000 to 2013).

Methods: Mortality data regarding patients who were diagnosed with lung cancer (any stage) was extracted from the Surveillance, Epidemiology and End Results (SEER) database from 2000 to 2013. The statistical query was limited to ages groups &lt;65 and &gt;65 years, included both the genders and races (classified as White and Black with Hispanic). Statistical difference was considered significant when p value &lt;0.05.

Results: Mortality rates have significantly declined in male patients with lung cancer across both races and age groups. However, a statistically significant difference between white and black patients continues to persist. In both white and black females aged &lt;65 years, the mortality rate has also decreased and the trend has converged to a similar rate. Notably, there is persistent difference in mortality between white and black elderly females. The linearized trend lines are depicted in Fig 1(not able to submit here).

Conclusions: Significant disparity in mortality between white and black male patients with lung cancer exists but has been diminishing over time in both younger and elderly patients. However, a different trend is noted between white and black female patients. The etiology of this disparity is unclear and may reflect past smoking habits, genetics, socioeconomic factors, systematic errors and reporting bias.
What's Your Number? Engagement Opportunities For Patients With Uncontrolled Diabetes

Background: 29 million people in the United States suffer with Type 2 Diabetes Mellitus (DM). This disease is the leading cause of blindness, nontraumatic lower limb amputation, and chronic kidney disease, placing a burden on our patients and the healthcare system [1]. Contributing factors include but are not limited to patient education, socioeconomic factors, and medication adherence. The aim of this study is to identify barriers to ideal glycemic control in our patient population.

Methods: Our study was designed to be a retrospective cross-sectional analysis. The patients were predominantly of Afro-Caribbean descent at a safety-net hospital in Central Brooklyn. 44 patients were polled from the Kings County DM Registry, which included resident clinic patients with a Hemoglobin A1C (a1c) above 8% seen between 2016-17. Patients were surveyed with a standardized questionnaire.

Results: 50% of patients felt that their diabetes was well controlled, despite all patients having uncontrolled DM (a1c >8), with the average a1c being 9.8%. 80% of patients were not able to state their own a1c or its significance. 45% of patients did not know the names or doses of their medications. 45% of patients graduated high school, and of that subgroup, only 16% had an understanding of their a1c. Patients identified difficulties with medication adherence such as polypharmacy, access to medications, and lack of insight about the disease.

Discussion: Patient engagement is essential to the management of chronic disease. A1c is the standard tool for assessing DM control, yet most of our patients with uncontrolled diabetes were unaware of their own values or its significance. Therefore, it is essential to ensure education on the tools to support patient self-efficacy through a1c teaching and medication reconciliation. Focusing interventions on these aspects can enhance medication adherence, lifestyle changes, and overall DM control.

Acquired Perforating Dermatosis In A Patient With Underlying Diabetes Mellitus And Liver Disease

Acquired perforating Dermatosis (APD) presents as pruritic, umbilicated lesions commonly located on the extremities in patients with underlying chronic systemic diseases or renal, endocrine or hepatic in origin. APD may be misdiagnosed as being viral in etiology, due to an appearance similar to that of molluscum contagiosum. Diagnosis can be made clinically in the proper patient context, and confirmed with skin biopsy.

64 YOF PMHx hypertension, type 2 diabetes mellitus (DM), hyperlipidemia and coronary artery disease was sent to the ED by her PCP after acute elevation in bilirubin. She reported 3 months of fatigue and decreased exercise tolerance, generalized pruritus and jaundice. Vital signs were all within normal range. Examination revealed scleral icterus, skin with hyper-pigmented, umbilicated papules with a central white core and larger plaques with central crusting on upper and lower extremities and back. Lesions were clean based without surrounding erythema or purulent discharge. Labs revealed total bilirubin 17 mg/dL, direct bilirubin of 9.2 mg/dL, alkaline phosphatase 1244 U/L, and slight AST elevation, all other labs within normal limits. She was admitted for further evaluation. Skin biopsy revealed altered collagen with keratin plug, findings congruent with perforating collagenosis. Pt started on corticosteroids for symptomatic relief. CT and MRCP imaging showed no evidence of biliary duct dilation or pathology. Trans-thoracic echocardiogram revealed diffuse hypokinesis with ejection fraction of 20%. Liver biopsy was consistent with hepatic congestion and the patient was diagnosed with congestive hepatopathy from severe systolic heart failure. After initiation of heart failure medications and diabetic control, labs trended down and skin lesions improved.

APD is frequently seen in chronic systemic diseases, usually DM and CKD. Treatment consists of topical retinoids, symptomatic control with topical steroids and emollients, and underlying disease control.
Clinical Profile Of Patients With Myocardial Infarction Associated With Marijuana Use.

Introduction: Marijuana is the most commonly abused substance in the US. It has been reported that the risk of myocardial infarction (MI) is increased 4.8 fold following marijuana use. Less is known about the clinical profile of patients presenting with MI following marijuana use.

Methods: A detailed search for case reports was conducted in Google Scholar and PubMed using the keywords marijuana, cannabis, MI, STEMI, NSTEMI. Fifty-nine cases were read and clinically profiled.

Results: 92% of cases were reported on or after 2000. The median age upon presentation was 29 years; 88% of the patients were male. The prevalence of hypertension was 17%, none had diabetes, 3% had hyperlipidemia, 5% were obese, and 46% were active cigarette smokers. 31% of the cases presented with MI within 6 hours of use and 41% within 24 hours of marijuana use. 42 patients had documented EKG findings, 39% of which were ST segment elevation MI. Troponin levels were documented in 19 patients, 90% had elevated troponins and 10% had normal troponin levels. Transthoracic echocardiography (TTE) was performed in 15 patients of whom 33% had normal TTE, 60% had reduced ejection fraction. Coronary angiography was conducted in 43 patients, 53% had coronary stenosis and 35% did not. Slow coronary flow was noted in 7% and stents were placed in 35%. Death due to MI was reported in 17%.

Discussion: The pathophysiological basis of MI associated with marijuana is unclear. Elevated carboxyhemoglobin, tachycardia, decrease in time for angina onset following use, slow coronary flow, coronary vasospasm, increased sympathetic tone and increased platelet aggregation have been proposed.

Conclusion: Marijuana use is associated with unique clinical profile of myocardial infarction. Most reported cases involve young males, nearly half of whom are active smokers and present late after symptoms. Demand ischemia may play an important role as the majority of MI's are non-STEMI; more than one third do not have coronary stenosis.
**Sickly Sweet- Challenges In Diagnosing Dysglycemia In Patients With Sickle Cell Trait**

49 y/o woman with sickle cell trait (SCT) presented for routine care in clinic. ROS was unremarkable. Mother has DM. She had normal vital signs, BMI of 25kg/m2 and examination normal. Labs were normal save for HbA1c: variant hemoglobin, A1C=25.5%. Oral glucose tolerance test (OGTT): Impaired Glucose Tolerance (IGT). Diet and lifestyle changes were advised. Three months later, remained asymptomatic, her weight was unchanged. Glycated Fructosamine was 290 umol/l (205 -285). Addition of low-dose Metformin, were discussed but she refused.

In reviewing the case one may consider ruling out a hemoglobinopathy in dysglycemic patients when wide variations are seen in A1C values. The A1C trend can be used to identify patients at risk of DM but there are limitations in patients with hemoglobin variants due to increase in red cell turnover. Serum fructosamine in this case would be inappropriate for screening. Dysglycemia refers to a disorder in the metabolism and regulation of blood glucose and may be applied to pre-diabetic and diabetic individuals. Patients with IGT may be identified as pre-diabetics which may confer risk of dyslipidemia, HTN and obesity. Individuals with hemoglobin variants may have falsely low or high levels of A1C. Fasting glucose and OGTT are the most appropriate alternatives for screening in such cases. Glycated fructosamine and albumin would be useful for monitoring in DM patients with hemoglobinopathies as values are not affected by disorders of hemoglobin metabolism or RBC survival. Both reflect short term control (2-3 weeks) and are affected by disorders of albumin metabolism. 1, 5-Anhydroglucitol is a newer test used as a measure of short term glycemic control but based on literature review is not extensively studied in hemoglobinopathies. Despite ongoing efforts to improve and standardize the measurements of A1C that would best apply to patients with hemoglobin variants it is still advisable not to use A1C in diabetics or prediabetics with SCD.

**Relationships Between Patientsâ€™ Perceptions Of Healthy Lifestyles And Control Of Hypertension, Diabetes, And Obesity**

Diabetes mellitus, hypertension, and obesity are among the most commonly encountered health problems in the primary care setting. In addition, they are each important risk factors for all-cause mortality and multiple medical comorbidities. We conducted a cohort study of 41 patients seen over the course of 1 month at a primary care clinic at Kings County. Patients were interviewed to determine the nature of their diet and exercise habits, and were asked if they perceived their lifestyle as healthy. In addition, their charts were reviewed to determine body mass index (BMI), hemoglobin A1c (HbA1c), blood pressure (BP), and the trends of these variables over time. 85% (35/41) of these patients had an elevated BMI, of which 34% (14) were obese. Of those patients with an elevated BMI, the majority had a stable or worsening BMI, indicating poor control of weight. 59% (24/41) of patients had diabetes, of which 61% had uncontrolled diabetes as determined by an HbA1c &gt; 7.0. 85% (35/41) of patients had hypertension, with no clear overall trend of blood pressure control over time evident. Most patients reported an active lifestyle (61%, 25/41) and a healthy diet (76%, 31/41). However, patientsâ€™ self-reports of diet and exercise were rarely in accordance with established medical guidelines for healthy lifestyles. Patientsâ€™ self-reported activity levels did not correlate with BMI, HbA1c, or systolic blood pressure. Similarly, patientsâ€™ self-reported healthiness of diet did not correlate with HbA1c or systolic blood pressure. However, healthiness of diet did show a significant correlation with BMI (p&lt;0.05). These results indicate that patient perception of health frequently does not correlate with objective measures of health. This gap between perception and outcomes can be addressed in part with greater patient education regarding healthy lifestyles and interventions to encourage adherence with lifestyle changes.
Clearing The Air: Improving Tobacco Use Screening In Resident Clinic

Background: Smoking is the leading cause of preventable death and morbidity in the United States, with a national prevalence of 15.1% and 14.9% in Brooklyn. Furthermore, it costs our healthcare system over $170 billion. Despite this, many New Yorkers continue to smoke. We at NYC Health + Hospitals/Kings County Primary Care clinic (KC) set out to evaluate our effectiveness in identifying tobacco use by administering a simple screening questionnaire.

Methods: The study population included patients seen at KC. The intervention group (A) established smoking status by use of a questionnaire. The non-intervention group (B) established smoking status via retrospective chart review, without the use of a questionnaire. Statistical analysis was performed to compare the effectiveness of the questionnaire as a screening tool in the A versus B group.

Results: In the intervention group (n=208), 9% were identified as smokers, 90% as non-smokers, and 1% were not documented. In the non-intervention group (n=240), 6% were identified as smokers, 53% as non-smokers, and 41% were not documented. The p value for identifying smoking status between the A and B group was 0.274. The p value for smoking status documentation between the A and B group was <0.001.

Discussion: Although the p-value for identifying smoking status between the A and B group was not statistically significant, our results show the absolute percentage of smokers documented was significantly higher in the A group compared to the B group (p<0.001). This demonstrates that implementing a smoking screening questionnaire at KC would drastically increase smoking status documentation, which should lead to a significantly higher number of smokers identified. With more smokers identified, we should be able to treat their tobacco addiction and reduce overall preventable morbidity and mortality associated with tobacco use.

Virtualizing Promis Measures In A Clinical Setting

Collecting and presenting data digitally in the waiting room - a way to better patient experience and increased access? Real time information is essential for clinicians to make the right decision for their patients. Modern computing has enabled us to do just that, from using geo-location to being able to talk anywhere you are, or sending text messages instantly. By digitizing patient questionnaires using PROMIS measures in conjunction with tablet devices, clinicians would have instant access to the results.

PROMIS measures ("Patient-Reported Outcomes Measurement Information System") is a set of person-centered measures that evaluates and monitors physical, mental, and social health in adults and children. It can be used with the general population and with individuals living with chronic conditions (1). In our study, while in the waiting room the patient uses a tablet to complete a questionnaire based on these measures and the tablet computer calculates a score immediately. Based on the scores generated different types of graphs would be created, to present to the doctor.

Five clinicians were tested on four different typical data interpretation tasks using four different types of visualization, and their eye movements and screen actions recorded. The data is analyzed for accuracy and speed of users' data interpretation and usersâ€™ overall perceptions of the system.

The study will test whether getting real time data from patients is beneficial to the overall wellbeing of the patients. In times of increased stress on the health system, methods of speeding workflow, addressing the needs of multicultural patients, and easing physician tasks are all ways to potentially facilitate greater access.
Mollaret's meningitis is a form of cyclical self-limiting aseptic meningitis that is often associated with previous HSV-2 genital herpes infection. The benign and recurrent nature of the disease should prompt clinicians to consider this diagnosis in the appropriate setting, thereby avoiding such patients to lengthy hospitalizations, unnecessary testing, and medications. This case highlights the often overlooked sequelae of genital herpetic infections, and urges clinicians to cast a broad differential for meningitis.

A 53-year-old African American male with known history of HSV-2 genital herpes and viral meningitis presented with severe headaches, vomiting, and subjective fevers for 1 week. He was treated 4 years prior for presumed viral meningitis. The patient was febrile to 101.4°F on admission with nuchal rigidity. The rest of his physical exam was unremarkable. His admission labs were inconspicuous. Head CT demonstrated no acute intracranial pathology. Lumbar puncture (LP) demonstrated normal opening pressure, normal glucose, modest elevation in protein (61mg/dl), mild lymphocytic pleocytosis (WBC 12/mm3), and negative CSF gram stain. CSF viral cultures were also negative. IV acyclovir was started with improved symptoms, however ongoing fluctuating pyrexia (max 103.1°F) prompted extensive imaging, infectious, and rheumatologic work up, which were all unremarkable. HSV viral PCR was not performed due to insufficient CSF and patient refusal of repeat LP. He self-discharged after 10 days of IV acyclovir treatment.

Although the CSF profile of Mollaretâ€™s Meningitis is similar to other aseptic meningitides, the hallmark is its recurrent nature. CSF PCR for HSV-1, HSV-2, or VZV aid in diagnosis and should be part of the initial workup in suspected cases. Antivirals result in faster symptom resolution and may suppress recurrences. This index case aims to foster awareness on the expansive differential for meningitis and a rare complication of genital herpes.

Inflammatory Patterns Exhibited By African American Colon Tumor-Derived Cell Lines

Despite progress in closing the gap, disparities still persist among African American (AA) colon cancer patients both in incidence and death rates. Our previous studies reported that colon tumors from AAs displayed hypermethylation of DNA regions in inflammatory genes when compared to Caucasian Americans (CA). To assess differences in the inflammatory response, we utilized three AA colon cancer cell lines (CHTN-06, SB-501 and SB-521) generated in our laboratory and compared them with the commercially available colon cancer cell lines, HT-29, SW-480 and CRL-1807. We evaluated the anti-inflammatory effect of Aspirin and the anti-inflammatory cytokine IL-10 by determining MAPK activation in response to the pro-inflammatory cytokine TNF-Î±. Additionally, we studied the secretion of the pro-inflammatory cytokine IL-8 in response TNF-Î± in the AA cell lines and compared them to the CA cell line HT-29. Interestingly, IL-10 treatment was more effective in the AA CHTN-06 and SB-501 when compared to the CA cell lines in the inhibition of activation of MAPK and as hypothesized, the CA cell lines demonstrated lower MAPKs activation levels in response to TNF-Î± after pretreatment with Aspirin (ASA). The AA cell line SB-521 on the contrary, showed a stable inflammatory state and unresponsiveness to ASA and IL-10 treatment; suggesting that AA tumors may require tailored treatments for controlling inflammation. Additionally, our results show significant differences in the inflammatory cytokine production of IL-8 in the CA cell lines in response TNF-alpha induction when compared to the AA cell lines. Altogether, our results portray the diversity of inflammatory patterns across the AA cell lines. Lastly, as it has been documented that AA colon cancer patients are less responsive to the chemotherapeutic Fluorouracil; therefore, in future studies we will evaluate the effect of this and other therapeutic agents on AA and CA cell lines in terms of inflammation and apoptosis.
Paclitaxel-Loaded Microparticles In Combination With Gemcitabine-Loaded Microparticles Decreases Gemcitabine Resistance And Promotes Cell Death In Pancreatic Cancer Cell Lines

Pancreatic cancer is the fourth leading cause of cancer death in the United States with only 7% of diagnosed patients surviving 5 years. Current systemic chemotherapies have not been very effective at decreasing tumor burden, but nonetheless expose patients to the adverse side effects of treatment. Poly(lactic-co-glycolic acid)-based microparticles (MPs) are a promising tool for localized drug delivery due to their high biocompatibility, flexibility in encapsulation and extended drug release. The present study investigated whether paclitaxel-loaded microparticles (PMPs), alone or in combination with GMPs, decreased gemcitabine resistance, colony formation and promoted cell death in two human pancreatic cancer cell lines, PANC-1 and MIAPaCa-2.

In vitro studies with PANC-1 cells treated with PMPs or GMPs showed enhanced cell killing and a significant decrease in colony formation. Moreover, the sequential treatment of PMPs followed by GMPs, showed a greater decrease in colony formation in comparison with the others. Subsequently, we tested the effect of the treatments on two well-known resistance markers for gemcitabine, ribonucleotide reductase catalytic subunit M1 (RRM1) and cytidine deaminase (CDA), as well as activation of apoptosis measuring cleaved caspase-3 (CC3). The sequential treatment and PMPs alone showed a significant decrease in RRM1 and CDA proteins and an increase in CC3 expression for both cell lines. However, when both cell lines were treated with GMPs alone, both markers went up suggesting an increase in resistance against gemcitabine.

In conclusion, the sequential treatment showed a reduction in drug resistance, an increase in cell death and impairment in colony formation. Further studies are in progress to investigate this treatment in a mouse model of pancreatic cancer to confirm in vivo efficacy. The described drug delivery method has the potential to be a more efficient local treatment modality than systemic drug against pancreatic cancer.

Relation Of Hepatitis B Virus Infection In Brooklyn Immigrants To Allergic Responses And Asthma

Rationale: Hepatitis B virus (HBV) is an immunomodulatory virus and has been linked to IgE production. We determined the association of HBV serologies to IgE responses in Brooklyn immigrants from HBV-endemic countries.

Methods: Serology testing (ELISA, Abnova) was performed on immigrants with (n=167) and without (n=175) asthma, allergic rhinitis, and food allergies. Patients who tested positive for HBV surface antibody (anti-HBs) were tested for HBV core antibody (anti-HBc) to identify natural infection versus vaccination. Anti-HBs negative subjects were further tested for HBV surface antigen (HBsAg) to identify infection prior to seroconversion. Serum IgE levels and exhaled nitric oxide (eNO) (Niox, Aerocrine) measurements were obtained on all patients. Chi-square tests were performed for associations between HBV groups [(1)non-vaccinated, non-infected; (2)vaccinated only; (3)past/current infection] and allergic diseases. Kruskal-Wallis tests were performed to compare distribution of serum IgE and eNO between HBV groups.

Results: 66% (n=226/342) of the sampled Brooklyn immigrant patient population was found to have past or current HBV infection. The prevalence of allergic diseases in HBV infected patients was 50.4% (n=114). We did not find significant association between natural HBV infection and development of seasonal allergies (p=0.39), asthma (p=0.25), food allergies (p=0.15), IgE (p=0.59), or eNO (p=0.24). Furthermore, there was no association of these factors with vaccination or non-infected/non-vaccinated status (p=NS).

Conclusions: There is no significant association between HBV infection and the development of IgE responses in this Brooklyn immigrant patient cohort.
A Rare Presentation Of Lactic Acidosis

Type B lactic acidosis (Type B LA) due to underlying malignancy is a rare paraneoplastic phenomenon and a life-threatening oncologic emergency. Though most commonly associated with hematological malignancies, it may be seen in solid tumors. The pathogenesis is likely multifactorial and may be due to enhanced aerobic glycolytic activity in malignant cells. A 59 year-old man presented with several weeks of epigastric pain, vomiting and a 35-pound weight loss. A cachectic patient was seen with epigastric tenderness and hepatomegaly. Initial labs: anemia, transaminitis and normal lactate. Abdominal CT scan: multiple liver masses with retroperitoneal lymphadenopathy. U/S guided liver biopsy: poorly differentiated adenocarcinoma. Alpha-fetoprotein, CA19-9 and CEA were markedly elevated. He improved with conservative management and discharged for oncology follow-up. He presented 8 days later with dyspnea and RUQ abdominal pain; was tachypneic, tachycardic, icteric with RUQ tenderness. Labs: worsening anemia, transaminitis and a high anion gap metabolic acidosis, for which bicarbonate infusion was given. CTPA ruled out PE but showed right sided pleural effusion. Thoracentesis: atypical cells suspicious for malignancy. He deteriorated with multi-organ failure. Lactic acid level increased to 23 mm/l and was determined to have Type B LA after Renal consult. RRT was deferred due to significant coagulopathy. He died in ICU by day 6. Type B LA due to underlying malignancy is a rare entity which should be considered early in patients who present without evidence of tissue hypoperfusion. Liver metastases with impairment has been reported as an attributable factor to decreased utilization of lactate. However, there are several reported cases of Type B LA without liver involvement. Bicarbonate infusions and RRT are supportive measures for managing metabolic derangements. Morbidity and mortality benefits are less likely to be seen without successful treatment of the underlying cancer.

Food Choices And Dietary Intake In A Population Of Inner City Kidney Transplant Recipients - Impact Of Food Cost

Factors that influence food choice in our ethnic minority kidney transplant (KTR) population are not known. Demographics and factors influencing food choice and preparation were obtained from face to face interview in 23 randomly selected clinic patients. Patient concern regarding food cost and its influence on choice was assessed using a 5 point Likert scale. Dietary intake was estimated from 3-day diet diary and 1 day diet recall. Nutrient values were extrapolated using the USDA Supertracker. 17 (80%) reported income <20,000 and Medicaid as primary Insurance. 15 (72%) reported receiving disability payments and 7/10 (70%) reported using EBT coupons to buy food. Mean age was 44.7±10.1, BMI 27.9±5.6, creatinine 0.88±0.1 mg/dl, 6 (29%) patients reported that cost of food was very important for their food choices (FDCOST). By Mann-Whitney U-test, FDCOST patients ate fewer calories per day (1127±84.8 vs 1786±150.5, p <0.05), less PO4 (887.3±174 vs 1257±127.5, p=NS) and less protein (48.5±17.5 vs 85.8±8.2, p+NS) but had similar serum PO4, BMI and albumin values. In a 30-second sit-to-stand test, 2 (30%) FDCOST patients were unable to complete the test. All of the patients who did not report concern with food cost completed the test successfully. In our population of indigent inner-City KTRs:

1) Despite the availability of EBT coupons, 30% of patients felt that food cost was an important factor in their dietary choices. Â
2) Patients who reported concern with food cost ate fewer calories, and less protein and PO4 than those who made choices based on other factors. Â
3) Although laboratory tests and BMI were similar between the two groups, the relative weakness in 30% of the patients who reported food cost concerns should be explored further, as fraility has important prognostic significance in the post-transplant patient.
Attitudes And Beliefs Of Patients Who Increase Exercise Following Transplantation And Association With Increased Vitamin D Levels

Despite improvements in anemia and uremia following successful kidney transplantation, not all patients report increased exercise habits. Demographics and beliefs about transplant were compared in patients who reported increased exercise (EXMORE) and those who decreased or stayed the same. Of 24 randomly selected clinic patients, 17 (80%) reported income <$20,000 and Medicaid as primary insurance. Mean age was 44.7±10.1, BMI 27.9±5.6, creatinine 0.88±0.1 mg/dl, 7/17 (41%) of respondents reported increased frequency of exercise following transplant. By Spearman correlation, EXMORE was associated with beliefs that doctors kept them healthy (r=0.5, p=0.05), less likely to believe that transplant cures disease (r=-0.59, p=0.05), had strong belief that medications kept their kidney healthy (r=0.58, p=0.05), and gratitude for their donor (r=0.6, p=0.05). Vit D levels were higher in the EXMORE group (31.9±3.2 vs 19.3±2.3, p=0.005), but there was no difference in hgb, creat, BMI, BP or other parameters. In our population of indigent inner-City Kidney recipients 1) Almost half reported increasing exercise following successful transplant. 2) Increased exercise was associated with strong evidence of external locus of control (belief in doctors and transplant medications), less belief that they were cured, and increased report of gratitude for the donor. 3) Because increase in exercise has many potential benefits, the association with higher Vitamin D levels which has been associated with improved muscle strength, as well as the appropriate approach to patients with an internal locus of control, who may require different motivation to exercise should be explored.

Meta-Analysis Of Blood Lead Levels In India And Associated Burden Of Disease

Lead (Pb) has long been identified as a pollutant of concern due to widespread contamination and its potential to impact human health. Chronic lead exposure and associated health effects have been widely documented in the scientific literature, and lead toxicity has been linked to cognitive impairment, intelligent quotient (IQ) deficits, cardiovascular effects, and low birth weight. Measuring the scope of lead contamination in India based on the available literature can provide valuable insights into the associated burden of disease. An extensive literature review was conducted of studies monitoring potential IQ deficits in Indian children.

A PubMed search was conducted in May 2016 using the terms "Blood Lead India". This search yielded a total of 593 articles. An inclusion criteria was established prior to the review in order to select relevant articles. The analysis of blood lead data in this study was performed using the statistical software STATA 14.1. In order to assess the disease burden of lead in India, the geometric means (GM) of blood lead measurements, in the context of various subgroups, were compiled for analysis. IQ deficit was determined using the identified lead levels of the "children" subgroup.

The final dataset included 22 studies with participants throughout India and resulted in 53 observations. The observations ranged from years 2011 to 2016. The overall GM was 19.03 ug/dL (10.42-34.75). For the subgroup age, adults had a blood lead level of 16.29 ug/dL (11.59-22.91) while children have a blood lead level of 19.89 ug/dL (9.76-40.54). Populations with occupational exposures had a blood lead level of 27.27 ug/dL (CI: 19.00-39.14) while those with non-occupational exposure had a blood lead level of 14.92 ug/dL (9.62-23.15). Within the study population, children were identified to have a GM BLL of 19.89 ug/dL (9.76-40.54). Using dual models, the mean IQ decrement for children in our study population is estimated to be greater than 5 points.
**Influence Of Family History Of Alcohol Use Disorder On The Development Of Post-Traumatic Stress Disorder And Cognitive Performance In Trauma-Exposed Adolescents**

Family history of alcohol use disorder (AUD) has been previously associated with adult post-traumatic stress disorder (PTSD). However, few studies have examined this using longitudinal, prospective reports in trauma-exposed adolescents and young adults, and no study has examined the role of neurocognitive performance in this context. Using data from the Collaborative Study of the Genetics of Alcoholism (COGA) prospective cohort, this study aims to determine whether trauma-exposed adolescents and young adults who report a family history of alcohol use disorder (AUD) are more likely to develop PTSD and/or display neurocognitive deficits, than those without a family history of AUD. COGA™s prospective cohort is comprised of offspring from AUD high-risk and comparison families who were aged 12-22 at enrollment and were interviewed every 2 years since 2004 (females=1246, males=1167). Traumatic exposures were collected using the Semi Structured Assessment for the Genetics of Alcoholism, which assesses 14 potentially traumatic events. In this study, we investigated the interactive effects of family history of AUD and trauma exposure (assaultive, nonassaultive, and sexually assaultive exposures) on DSM-IV PTSD and Tower of London task (TOLT) performance, after controlling for age, sex and socio-economic indicators. A significant interaction of family AUD density and trauma exposure was observed (β=0.164, p<0.05) such that adolescents who were exposed to traumatic events and had a family history of AUD had greater risk for PTSD as compared with those without a family history of AUD. In addition, early differences in TOLT performance that are no longer present later in development were observed for those with a family history of AUD and exposure to assaultive trauma. Understanding the influence of family history of AUD on the development of PTSD in trauma-exposed subjects could help guide future research concerning mediating factors involved in the development of PTSD.

**Disruption Of The Serotonergic System In The Suicidal Brain; Small Molecule Profile Of The Effects Of Early Life Stress Obtained By Lc-Ms/Ms**

Affective disorders encompass prevalent and common mental health issues which affect approximately 20.9 million American adults, which is approximately 9.5% of the population annually (Kessler et al., 2005). It is estimated that >30% of depressed patients suffer from treatment resistant depression (Sourey et al. 2006) which puts these individuals at a higher risk of suicide (Gilbert, 2013). Early life stress (ELS), has been shown to be a risk factor in the development of TRD (Kaplan et al., 2000). Furthermore, evidence of TRD being more than just a simple neurochemical deficit has been found. In fact, increased serotonergic neurons have been found in the dorsal raphe of suicide victims (Underwood et al. 1999). When considering the role of serotonin in TRD a more definitive neurological model is needed to treat these high-risk patients more effectively. Disrupted social bonds which result in feelings of loss is the basis for classical models of depression in humans (Mourning, 2004). Bonnet macaques (Macaca radiata) were exposed to a separation stress paradigm, which included a group of animals that were exposed to social isolation on a cyclic basis for 15 weeks and a second group that was consistently kept in a social environment (Perara et al., 2011). Serotonin along with other small molecules were then chemically extracted from perfused brain slices and analyzed using LC/MS/MS Sciex 6500+. It is hypothesized that ELS causes disruption and not a deficit in the serotonergic system, and therefore TRD is a block in serotonin that cannot be treated by increasing serotonin in the brain with the use of SSRIs.
Sensory Modulation In First-Break Psychosis - A Pilot Study

Objective: To examine impact of introducing a sensory modulation room on acute first-break psychosis inpatient psychiatric unit as adjunctive treatment to psychopharmacology and therapy. We predict sensory mod will help reduce pt self-reported distress level, and reduce rates of acute events, manual holds, and STAT meds for agitation.

Methods: Pts rated distress before and after use of room, initiated by pt or staff, collected Feb-Dec 2016. Rates of STAT IMs, PO PRNs +/- Benadryl, manual holds (MH), and acute event (Tier) notes (TN) were reviewed for Mar-Sept 2015 (before) and compared with corresponding months in 2016 (after intro of room). Time period chosen to minimize differences due to change in attending physician after Sept 2016.

Results: Pt self-report from 56 uses of room. Data showed avg change of 4.28 out of 10-pt scale after use of room, 87.5% of pts reporting (+) change in subjective mood (more tense to more relaxed). 4 pts had (-) change and 3 pts had no change. All outcome variables showed reduction from 2015 to 2016, but avg monthly rates were not statistically significant. 6 paired t-tests conducted. STAT IMs 2015(19.0+/-.15.3) vs 2016(14.7+/-.5.6), p=0.50. PO PRNs +Ben 2015(40.9+/-.10.2) vs 2016(33.9+/-.8.9), p=0.20. PO PRNS-Ben 2015(33.3+/-.7.6) vs 2016(25.0+/-.7.0), p=0.06. MH 2015(3.7+/-.3.0) vs 2016(3.4+/-.1.1), p=0.82. TN 2015(17.6+/-.11.8) vs 2016(15+/-.4.6), p=0.60.

Discussion: Use of sensory room showed (+) change in subjective anxiety. Downward trend of STAT IMs, PO PRNs +/- Ben, MH, and TN with intro of room, suggest sensory approaches may promote least restrictive means to manage aggression, but results not statistically significant. This may be due to already low rates of STAT meds and MH on unit even before intro of room, thus only very large reductions would be significant. Pts more agitated and likely to get PRNs/MHs also more likely too acute or intense to use sensory room. Decline in PRNs/MHs show potential for sensory mod as adjunctive tx.

Lamotrigine-Induced Stevens Johnson Syndrome/Toxic Epidermal Necrolysis In A Young Adult: A Case Report

Borderline Personality Disorder (BPD) is a constellation of symptoms including impulsivity, aggression, affective instability, transient psychotic symptoms, and interpersonal dysfunction. Lamotrigine (LTG) is an anticonvulsant medication used for seizure disorders and for maintenance treatment of depression in bipolar disorder. Evidence suggests that mood stabilizers/anticonvulsants are effective in treating affective dysregulation and impulsive aggression in BPD. The use of LTG is associated with skin rash, not well characterized among patients with psychiatric disorders. Most rashes are benign, yet they may herald a life-threatening eruption. Stevens-Johnson Syndrome (SJS) and Toxic Epidermal Necrolysis (TEN) are rare, severe mucocutaneous skin reactions affecting 10% and 30% of body surface area respectively, with more than 90% mucosal involvement. We present a 19-year-old with a history of major depressive disorder, bulimia nervosa, and BPD who was prescribed lamotrigine 25 mg daily. Two weeks after initiation, she presented with flu-like symptoms and fever, attributed to a positive Influenza A swab. Four days later, she developed an erythematous itchy rash on her chest, arms, and face, associated with uptitration of LTG from 25 mg to 50 mg daily. LTG was discontinued, but three days later, it progressed to a diffuse, erythematous maculopapular rash of the face, anterior chest, abdomen, bilateral upper/lower extremities and back. She was admitted for SJS/TEN overlap secondary to LTG, receiving symptomatic treatment along with IVIG per standard protocol. She responded appropriately, and LTG was not restarted. While literature on the use of LTG in BPD is limited, prescribing rates are high. Data support use of LTG to treat mood dysregulation in BPD, but it is essential that clinicians recognize signs of potentially fatal adverse outcomes, and further studies are needed to evaluate the prevalence of life-threatening side effects in specific psychiatric disorders.
Rishab Gupta

Is This Avoidant/Restrictive Food Intake Disorder? Questions And Considerations For Icd-11 Classification For Eating Orders

The nosology of eating disorders is undergoing a vast change. As a part of the revision process, the new diagnostic category of "Avoidant/Restrictive Food Intake Disorder" (ARFID) replaces the "Feeding Disorder of Infancy or Early Childhood" of DSM-IV to include those patients who have restrictive patterns of diet, but do not endorse weight or body shape concerns as the primary reasons for these restrictions. DSM-5 broadened the scope of ARFID to also include adults with restrictive eating patterns, which cannot be explained otherwise. We intend to highlight the nosological issues with ARFID as a diagnosis among adults. We are presenting a case series describing four patients presenting with disordered eating causing significant dysfunction that occurred for the first time in adulthood. In each patient, anxieties regarding the consequences of eating multiple types of food led to significant restrictions of the quantity or kinds of diet which was associated with distress and dysfunction, and, significant weight loss. However, in all the cases, the restriction was secondary to the fear of physical symptoms which could be explained by underlying ICD-10 somatoform disorder. The cases do not match the classic western description of ARFID. This series highlights some of the issues relating to the eating disorder, particularly its clinical and nosological status. Problems relating to classification in a non-western setting are also reflected by the difficulty in labeling eating-related problems amidst the interplay of somatization, culture and eating.

Paulo Sales

Levodopa Enhances Immobility Induced By Spinal Cord Electromagnetic Stimulation In Rats: A Novel Treatment For Catatonia?

Background: Catatonia is a clinical syndrome composed of complex motor signs, disturbances of volition, and autonomic instability that can be life threatening. Empirical data from an animal study suggest that spinal repetitive ElectroMagnetic Stimulation (rEMS) can lead to complex locomotor responses that resemble catatonia. However, no studies explored the possibility of applying spinal rEMS to treat psychiatric disorders.

Methods: A literature review was conducted on the NCBI database (PubMed) to identify original studies and review articles about the pathophysiology and treatment modalities of catatonia.

Results: There is a paucity of data regarding the pathophysiological mechanisms of catatonia. In an animal model, spinal rEMS promoted locomotor reduction and increased stereotypical responses in rats previously treated with Levodopa + Benserazide, what resembles the clinical manifestations of catatonia in humans.

Conclusions: Cervicothoracic rEMS induced a complex immobility response that resembled catatonia and was, in part, modulated by dopaminergic pathways in rats. The rEMS is a non-invasive method applied to modulate neurocircuits in real-time to treat neuropsychiatric conditions. Thus, spinal rEMS could potentially be part of an innovative treatment for catatonia. Further studies are necessary to explore this possibility.
**Interaction Of Early Life Stress (Els) And Short Allele Of Serotonin Transporter Gene (Stg) And Hippocampal Volume And Neurogenesis Rates**

ELS coupled with the short allele STG is a vulnerability group associated with depression. We examined the effect of this interaction on bilateral hippocampal volumes and rates of neurogenesis in bonnet macaques. In addition, the relationship between brain volumes and neurogenesis rates was studied. 25 adult male macaques [mean (SD) weight = 9.86 (2.67) kg; age = 8.48 (1.45) years] were studied. 9 were reared under randomly assigned variable foraging demand (VFD) conditions, a form of ELS. 6 of 9 VFD were heterozygous and 0 of 16 of non-VFD had the short allele (p= 0.005). Doublecortin counts were quantified and logarithmically converted. A subgroup of 15 macaques [weight = 10.01 (2.48) kg; age = 8.68 (1.05) years] was used to examine the relationship between brain volume and neurogenesis rates. Adult male macaques with one short allele and ELS exposure were found to have significantly reduced neurogenesis [N=6, log Doublecortin mean (SE) = 2.54 (0.49)] versus remainder [N=19, mean (SE) = 4.63 (0.28); F (1, 23) = 6.87, p=.015, n = 25]. There were no weight or age differences. (p>.15). An effect of this vulnerability group was also noted on hippocampal volume [F (1, 17) = 6.47; p = 0.021]. Fisher LSD post hoc testing revealed that VFD-reared macaques with STG exhibited an asymmetrical increase in hippocampal volume, with right greater than left [p = 0.030]. GLM analysis also revealed a correlation between brain volumes and rates of neurogenesis [F (1, 13) = 10.76; p = 0.006; n = 15]. Macaques with low brain volume exhibited higher Doublecortin counts. ELS and short allele of STG was associated with increased volume of right hippocampus and reduced rates of neurogenesis in adult male macaques in a grouping where there were no age and weight differences. Low brain volume was associated with higher rates of hippocampal neurogenesis consistent with previous work showing macaques with lower BMI have higher rates of neurogenesis.

**Use Of Hematopoietic Growth Factors In The Management Of Clozapine Induced Blood Dyscrasias.**

Intro: Clozapine use for treatment resistant Schizophrenia is limited by agranulocytosis. Presented is an updated review on using G-CSF for clozapine-induced granulocytopenia in clozapine re-challenge, comorbid immune suppression, & treatment augmentation. Method: MEDLINE review for articles published August 2016. MeSH terms: Hematopoietic Cell Growth Factors, Bipolar % Related Disorders, Schizophrenia Spectrum & Other Psychotic Disorders, G-CSF, Antipsychotic Agents, Myelopoiesis & Neutropenia. Results: 50% patients show a mean prodromal WBC drop at 29.3 +/- 12.6 days before agranulocytosis. In rechallenge, onset is quicker & severe. Neutrophils exposed to serum of those who developed agranulocytosis underwent complement activation & cell lysis, suggesting an immunological mechanism. Clozapine metabolite N-desmethylclozapine is toxic to myeloid precursor cell. Clozapine bioactivated to nitrenium ion lead to neutrophil apoptosis. Filgrastim raises peripheral ANC within 4 to 24 hours through actions of cytokines such as IL-1B, LPS, TNF-a, CD4, Th17 & IL-23 downregulates G-CSF. Endogenous G-CSF levels rise during transient increase in ANC at clozapine initiation. G-CSF levels in agranulocytosis has inconsistent relation to ANC levels. Discuss: Monitoring endogenous G-CSF levels with WBC counts during clozapine-induced neutropenia helps distinguish between benign & malignant neutropenia leading to agranulocytosis. Measured endogenous levels of G-CSF & other cytokines have varied with progression of granulocytopenia. The duration of onset, progression & recovery after discontinuation of Clozapine are mixed. This indicates that multiple mechanisms may exist in clozapine-related blood dyscrasias & may explain the inconsistent efficacy of G-CSF on clozapine-induced agranulocytosis. Distinguishing between benign and malignant neutropenia is needed to identify cases that would benefit from Filgrastim. It’s use in clozapine rechallenge reduce the risk from agranulocytosis in treatment resistant schizophrenia.
Tetiana Gritsik

Effect Of Demographics, Location, And Admission Status On Length Of Stay For Pediatric Appendectomy Patients In New York City

Objective: Standard treatment for acute appendicitis almost always involves removing the appendix (appendectomy). In the United States, more than 64,000 appendectomies are performed on children yearly, ranking it to be the most common pediatric surgical emergency.

The length of stay (LOS) is a metric commonly used in statistical analysis for health planning purposes, evaluation of quality of care and patient outcomes prediction.

After reviewing existing research, this study aims to determine a correlation between demographics, location and admission status on length of stay for pediatric appendectomy patients in NYC.

Methods: De-Identified data for this study was obtained from Statewide Planning and Research Cooperative System (SPARKS) 2014 Hospital Inpatient Discharges. Primary outcome measures are length of stay (LOS), APR Severity of Illness, County where the procedure was performed, patient Race and Gender, and Emergency Department Indicator. We have selected pediatric patients (0-17), who were admitted in 5 counties of NYC with primary diagnosis of appendicitis (CCS Code 142) and procedure of appendectomy (CCS Code 80). Total number of records: 1 855. Statistical analysis included descriptive statistics, analysis of variance and correlation between five factors and LOS and was performed using SAS 9.3 (SAS Institute Inc, Cary, NC).

Results: More than 80% of all pediatric cases in NYC were marked as ED cases and showed longer LOS. Males had higher hospitalization frequencies at 61.5% as opposed to females at 38.5%. Race analysis showed that 58.8% of all cases are Other/Multi Racial. The study did not reveal a statistically significant linear relationship between County, Race, Gender, ED indicator and LOS. To conclude, only Severity of Illness correlates with LOS (p &gt;0.05) in pediatric appendectomy patients in NYC: more complicated cases have longer hospitalization (1.59 days for minor, 4.44 for moderate, 8.76 for major and 18.25 for days for Extreme Severity).

Amir Momeni-Boroujeni

Mutational Clustering Of Endometrial Carcinomas And Their Prognostic Significance: Morphologic Classification Is A Better Predictor Of Survival Than Mutational Clustering In Endometrial Carcinoma

Introduction: Endometrial carcinomas have two main subtypes: serous and endometrioid. It has been known that serous adenocarcinomas have a worse prognosis than endometrioid carcinomas. In this study, we aim to cluster the endometrial carcinomas based on their mutational profile and compare the survival statistics of the mutational versus morphologic clustering.

Methods: 548 cases of Endometrial cancers (Serous and Endometrioid) from The Cancer Genome Atlas were studied. Their survival and mutational data for the most common mutations in endometrial carcinomas was extracted. A network analysis method was used to cluster the cases based on their mutational profiles. The survival of mutational clusters and morphologic clusters were compared using survival statistical tools.

Results: After adjusting for clinical stage, morphologic clustering of endometrial carcinomas was found to have a better correlation with survival compared to mutational clustering (p value: 0.007) with endometrioid carcinoma having the best prognosis (average survival: 110.55 months) followed by mixed endometrioid and serous carcinomas (average survival: 36.1 months) and serous adenocarcinoma (average survival: 30.09 months). Of note, a subcluster of endometrioid endometrial carcinoma cases with a unique mutational profile (with mutations in PTEN/FGFR2/NRAS/CCND1/CYLC1 and no mutation in PIK3CA and none of type I endometrial carcinoma mutations) have a significantly better prognosis (p value: 0.022) compared to the other endometrioid carcinomas irrespective of clinical stage.

Conclusion: Our results show that while mutational clustering of endometrial carcinomas is possible, these clusters do not conform with histologic grouping of endometrial carcinomas because of shared mutations between endometrioid and serous adenocarcinomas. Morphologic grouping is a better predictor of outcome compared to genetic clustering.
Computational Image-Analysis To Distinguish Well-Differentiated Hepatocellular Carcinoma From Normal Liver Tissue

Background: Distinguishing well-differentiated hepatocellular carcinoma (WD-HCC) from other hepatic lesions is challenging because of morphologic similarities between them. Computational image-analysis offers new opportunities for objective diagnosis through quantitative assessment of histological features. Here, we have used automatic image processing and statistical analysis to differentiate between the WD-HCC and normal liver tissue (NLT).

Design: Twenty core liver biopsy specimens (11 WD-HCC; 9 NLT) were retrieved and re-evaluated. Images (98 WD-HCC; 97 NLT) were obtained at 400x from non-overlapping areas in H&E stained slides, excluding areas with inflammation, steatosis, cholestasis, artifacts, and portal triads. The computer was trained on 47 WD-HCC and 47 NLT images by classification algorithm for computational image analysis. The remaining images (51 WD-HCC; 50 NLT) were used to test the algorithm. Images were deconvoluted to subtract background colors. After noise reduction and Otsu thresholding, morphologic opening and connected component analysis were applied to enumerate the number of nuclei.

Results: There were greater number of nuclei in WD-HCC as compared to NLT (463.4±84.0 vs. 278.5±32.5; p<0.001). Applying these data from test cases an ROC was developed using binary classification. The remaining images (51 WD-HCC; 50 NLT) were tested by the binary classification algorithm. This computational image analysis differentiated WD-HCC and NLT with a sensitivity of 98% and specificity of 96% with a Kappa coefficient of 0.94.

Conclusions: Computational image analysis of nuclear density differentiated WD-HCC from NLT. The nuclear density was significantly higher in WD-HCC than in NLT. Computerized image analysis can be used to assist in the diagnosis of hepatocellular carcinoma especially in suboptimal specimens.

Hypothalamic Aromatase Activity Varies Over The Rat Estrous Cycle: Contribution Of Circulating Estrogens

Estrogens are known to play an important role in regulation of a myriad of central nervous system (CNS) functions, including mood, memory, cognition, neuroprotection, and pain. Aromatase (Aro), which synthesizes estrogens from androgens, is present not only in reproductive organs, but also throughout the CNS. It is particularly concentrated in hypothalamus, a neuroendocrine organ regulating many bodily functions. However, factors that regulate hypothalamic Aro activity (and thus the availability of locally produced estrogens) are largely unexplored.

I assessed the influence of changes in circulating estrogen levels on hypothalamic Aro activity using the tritiated water release assay. For these experiments, I used hypothalami from male, proestrous, diestrous, and ovariectomized rats, as well as from rats supplemented with subcutaneous estradiol (the most potent estrogen) following ovariectomy or during diestrus. I also examined if the differences in Aro activity can be attributed to changes in Aro protein levels.

My data showed that hypothalamic Aro activity: (a) is higher when circulating estrogen levels are higher, (b) is restored by estradiol replacement, but only in intact rats, suggesting that factors in addition to estradiol alter Aro activity, and (c) is not proportional to the corresponding Aro protein levels, suggesting the importance of acute (presumably chemical) modification of Aro to regulating its activity. Understanding factors that alter production of hypothalamic estrogens could yield insight into the regulation of CNS Aro activity, providing better comprehension of and potentially guiding development of pharmacotherapies for CNS disorders of estrogen-dependent functionalities.
Avi Hameroff
Advisor(s): Ozgul Muneyyirci-Delale

Prostaglandin Levels In Pregnant Women With And Without Hyperemesis Gravidarum

Severe nausea and vomiting of pregnancy is known as hyperemesis gravidarum (HG) and affects 0.5-2% of pregnancies. It was proposed by Muneyyirci and Cunningham that a casual association existed between HG and primary dysmenorrhea (PD), thought to result from elevated levels of prostaglandins. They observed some patients with HG reported PD, and it was found that patients with severe HG were 10x likely to have PD. Many hormones, hormone releasing factors, cytokines and prostaglandins have been found to stimulate the synthesis and release of hCG, and it is prostaglandin E2 (PGE2) which is known to cause nausea and vomiting of pregnancy. Prostaglandin dehydrogenase (PGDH) converts PGE2 to its inactive metabolite 5-ketoprostaglandin E2. The activities of PGDH are regulated by progesterone. The natural reduction of progesterone between 5-9 weeks of pregnancy results in low activities of PGDH which increases maternal level of PGE2.

We predict that pregnant women in the first trimester with hyperemesis gravidarum will have elevated levels of PGE2 in their plasma.

IRB-approved consent was obtained from subjects. A questionnaire was administered, and the specimen was collected and stored at -80F. Plasma prostaglandin levels were assessed using Cayman Chemical Prostaglandin E Metabolite ELISA Kit and compared between the groups. Data were analyzed using two-tailed Student's t-test, Fisher exact test and odds ratio. We enrolled 18 women: 12 with HG and 6 controls without. Pregnant women with HG during a prior pregnancy were 10 times more likely to develop HG in subsequent pregnancies. HG women reported the start of nausea and/or vomiting at approximately 5.8 ± 1.5 weeks of gestation that continued until 22.3 ± 9.5 weeks of gestation. Plasma prostaglandin levels were significantly higher in HG women than in controls. HG: 93.4 ± 19.9 pg/mL, Control: 62.9 ± 34.9 pg/mL, p =0.015

PGE2 may be involved in the etiology of HG. Further studies are needed to confirm.

Robert Alexander
Advisor(s): Susana Martinez-Conde

Gaze Behavior During The Averted Detection Of A Simulated Faint Star

Vision in daytime conditions relies on pointing one's fovea to successive targets of interest. Looking directly at visual targets may not be the best strategy to acquire information in nighttime conditions, however, because rods (which mediate night vision) are absent from the fovea. Here we explored the relationship between eye movements and perception in scotopic conditions, with a technique first proposed around 325 BC and still used today, known as “averted vision” Looking away from faint celestial objects, instead of directly at them, can improve their detection. The reason is thought to be that light falls on more rods as the objects approach ~20° of visual angle away from the center of gaze. No studies have determined the pattern of averted vision that best facilitates perception, however. We assessed averted vision while recording eye positions of dark-adapted human participants, for the first time. We used a CRT monitor and a series of three neutral density filters to create a centrally-placed dim artificial star, of apparent magnitude 4.2 (dimmer than Tau Ceti). After dark-adapting, participants (n=12) made eye movements to a series of fixation targets, viewed binocularly. Participants made a yes/no judgment about whether the star was visible at each fixation location. This provided a map of detection performance in all directions surrounding the star. If rod-cone distribution was the sole predictor of performance, we should have found peak performance 20° away from the star and a linear improvement as gaze approaches 20°. Contrary to this prediction, our participants’ accuracy peaked around 10°, and decreased at greater distances. This work may provide a better understanding of rod function, and in turn lead to improved screening and assistive technologies for eye movement and night vision disorders.
Nandadevi Lahiri  
Advisor(s): Christopher Roman  

Regulation of CD4 T cells by MiT family of proteins

The MiT family of transcription factors consists of four members: TFE3, TFEB, MiTF and TFEC. TFE3 and TFEB have been shown to be involved in the control of two genes which are critical for CD4 T cell function: CD40L and FoxP3. CD40L is necessary for protective antibody responses and cellular immunity because it activates B cells and macrophages, respectively, via the receptor for CD40L, CD40. FoxP3 is necessary for the generation of regulatory CD4 T cells (Tregs), which have an essential role in suppressing autoreactive and other undesirable immune reactions. My research will focus on establishing a clearer picture of the physiological importance and regulation of CD40L and FoxP3 by TFE3 and TFEB. To this end, I will be studying T cell function, such as in models for CD40L-dependent cellular immunity, in mice that are deficient in TFE3, TFEB or both. In addition, I will be using mouse models for spontaneous and induced mucosal inflammation to test the importance of TFE3-dependent FoxP3 expression, because Tregs are important for preventing this process. In complementary studies, I will be examining TFE3- and TFEB-dependent CD40L and FoxP3 expression in primary human and mouse naive CD4+ T cells to examine under what conditions TFE3 and TFEB are needed. I will also be comparing TFE3 and TFEB expression in a cohort of CD4+ T cells from healthy individuals and patients suffering from Systemic lupus Erythematosus (SLE), because CD40L and Foxp3 expression is abnormal in this autoimmune disease. Through my work I hope to provide greater insight in to the cause of autoreactive disorders.

Hui Jiang  
Advisor(s): Xian-Cheng Jiang  

Plasma Phospholipid Transfer Protein Promotes Platelet Aggregation

It remains unclear whether plasma phospholipid transfer protein (PLTP) is involved in hypercoagulation or hypocoagulation. We addressed direct effect of PLTP on platelet aggregation and the underlying mechanism. We found that PLTP overexpressed mice decrease bleeding time, while PLTP deficient mice increase it. We also found that human platelets secrete PLTP under stimulation. Platelet aggregation increased upon PLTP overexpression whereas it decreased with PLTP deficiency in a gene dose–dependent manner. Human recombinant PLTP increased mouse or human platelet aggregation in a dose-dependent manner. Phosphatidylserine externalization provides a water/lipid surface for the interaction of coagulation factors, which accelerates thrombosis. Compared with wild type controls, platelets from PLTP transgenic mice had significantly greater amounts of phosphatidylserine on the exterior surface of the plasma membrane, whereas platelets from PLTP-deficient mice had significantly less on the surface, thus influencing fibrinogen binding. Moreover, recombinant PLTP together with ADP significantly increased phosphatidylserine exposure on the plasma membrane of PLTP-deficient platelets, thereby increasing fibrinogen binding. Importantly, PLTP overexpression significantly accelerated the incidence of photothermolysis-induced infarction, whereas PLTP deficiency significantly reduced the incidence. We concluded that PLTP promotes phosphatidylserine externalization at the plasma membrane of platelets and accelerates ADP- or collagen-induced platelet aggregation. Thus, PLTP is involved in hypercoagulation. Therefore, PLTP inhibition could be a novel approach for countering thrombosis.
Synaptic Pruning in Layer 3 of the Medial Prefrontal Cortex in Female Mice

The onset of certain neurodevelopmental disorders, such as schizophrenia, overlaps with the maturation of the prefrontal cortex (PFC), suggesting that it is implicated in their etiology. Unlike other areas of the brain, the PFC is not fully developed until early adulthood. It is well established that before puberty the number of synaptic spines located on the dendrites of cortical pyramidal cells increases dramatically. These synaptic connections that develop before puberty are pruned during adolescence; this process, known as synaptic pruning, is thought to be important for normal cognition because dysregulation of this process appears to result in neurodevelopmental disorders. However, the initial mechanisms which trigger synaptic pruning remain largely unknown. It is known that the spines of cortical pyramidal cells receive GABAergic input. In order to begin investigations to test the role of the GABAA receptor in this process, I initially sought to establish whether synaptic pruning occurs in layer 3 of mPFC of female mice, which has not yet been shown. To this end, I examined layer-specific pruning in the mPFC using the Golgi-Cox staining method in female mice at puberty (PND 35, confirmed by vaginal opening) and post-pubertally (PND 56). Spine counts were obtained using a Nikon Eclipse Ci-L microscope and manually counted. Spine density in Layer 3 of the mPFC decreased by 31% (P<0.05) from puberty to post-puberty. This suggests that synaptic pruning occurs in layer 3 of the prefrontal cortex in female mice, which prior to this study, has not been shown. Future studies seek to identify if synaptic pruning is GABA mediated through various drug and knockout studies.