Abstract 1

THE EFFECT OF ESTRADIOL ON IMPLANTATION AND PREGNANCY RATES IN PATIENTS UNDERGOING CONTROLLED OVARIAN HYPERSTIMULATION USING A GNRH AGONIST TRIGGER PROTOCOL

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Purpose: This study’s purpose was to analyze the effect of estradiol levels on implantation and live birth rates in patients undergoing Controlled Ovarian Hyperstimulation using a GnRH Agonist Trigger Protocol. The use of GnRH agonist to trigger ovulation has gained favor in recent years as a method to reduce ovarian hyperstimulation syndrome (OHSS). A body of literature suggests that high estradiol levels on the day of an HCG trigger in HCG trigger protocols are associated with low implantation rates. Our objective is to analyze whether this same E2 effect is present in GnRH agonist trigger protocols.

Methods: Between November 2001 through October 2010, 253 women were identified who underwent controlled ovarian hyperstimulation using a GnRH Agonist protocol resulting in a fresh embryo transfer from the Arizona Reproductive Medicine Specialists clinic. A retrospective chart review was performed with collection of outcome and laboratory data. All the patients who were identified were included in the analysis. Data was collected number of embryos transferred, implantations seen on ultrasound and live births that occurred. Patients were stratified by their estradiol levels on the day of implantation. The main outcome measures were live birth and implantation rates. Two methods were used for analysis. An ANOVA analysis was used to compare the two outcome measure between 4 groups of patients stratified by their day of implantation estradiol level. A second analysis was performed using the one tailed t test and comparing the two outcome measures between two groups of patients stratified by their day of implantation estradiol level.

Results: The patients were stratified into 4 groups by E2 level: E2<1999 (n=31), E2=2000-3999 (n=116), E2=4000-5999 (n=86), and E2>6000 (n=20). Implantation rates were as follows: E2<1999 (20.4%), E2=2000-3999 (23.3%), E2=4000-5999 (28.8%), and E2>6000 (30.0%), p=0.72. Live Birth rates were as follows: E2<1999 (9.7%), E2=2000-3999 (16.4%), E2=4000-5999 (18.6%), and E2>6000 (25.0%), p=0.52.

An unpaired one-tailed t test was also performed dividing the patients into two group stratified by their E2 levels: E2<5999 (n=233) and E2>6000 (n=20). Implantation rates were 35.2% in the E2<5999 group and 30% in the E2>6000 group, p=0.32. Live birth rates were 16.3% in E2<5999 group and 25% in the E2>6000 group, p=0.16

Conclusions: Although the differences in live birth and implantation rates between the groups in both analyses were not shown to be significant, the 11 patients with the highest E2 levels had no implantations or live births. A higher powered study could be done to further explore whether a high E2 level on the day of implantation is associated with a lower implantation and live birth rate.
Abstract 2

**SHWACHMAN-DIAMOND SYNDROME IN A PATIENT WITH LATE NEUTROPENIA**

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**Introduction:** Initially described in the 1960s, Shwachman-Diamond syndrome (SDS) is a rare autosomal recessive disorder characterized by exocrine pancreatic insufficiency, bone marrow failure, and skeletal abnormalities. As the second leading cause of inherited pancreatic insufficiency after cystic fibrosis, SDS patients classically have steatorrhea, diarrhea, fat-soluble vitamin deficiencies, and failure to thrive. As the third leading cause of inherited bone marrow failure, SDS is most likely to result in intermittent neutropenia (98% of patients) at presentation, but anemia (42%), thrombocytopenia (34%) or pancytopenia (19%) also occurs. This tendency towards neutropenia may help to explain why children with SDS have recurrent infections. Skeletal abnormalities may include rib cage deformities, osteopenia, and metaphyseal dysostosis. Ninety percent of affected patients have a mutation of the Shwachman-Bodian-Diamond syndrome gene (SBDS) on chromosome 7q11. This gene is thought to be involved in ribosome biogenesis and mitotic spindle stabilization. Although it is autosomal recessive, SDS is more common in men (1.6:1), with no racial or ethnic predilection. SDS is a clinical diagnosis and up to 10% of cases are negative for the SBDS mutation. Several studies and registry analyses suggest that SDS is more common than originally suspected (1:75,000) since the advent of genetic testing.

**Case Study:** A 7-month-old male with a past medical history significant for recurrent respiratory infections and failure to thrive presented with three days of cough, difficulty breathing, decreased oral intake with continued baseline malodorous stools. Of note, the patient had two prior hospital admissions in the past three months for bronchiolitis and was placed on budesonide and albuterol. There was concern for cystic fibrosis, but a sweat chloride test during his prior admission was negative. A workup during prior admissions revealed an abnormally low fecal elastase (<15), elevated transaminases, and normal alpha-1-antitrypsin. Thyroid and celiac studies were normal. It was noted that patient had lost 0.27kg in the past month. The patient did not initially have neutropenia, therefore, SDS was not considered. During the current admission, respiratory cultures grew moraxella and the patient was started on amoxicillin-clavulanate, as well as fluticasone and montelukast. Further, the patient was found to have eczema and was placed on a corticosteroid cream. During his hospital course, the patient developed bilateral otitis media and Candida diaper dermatitis. A repeat sweat chloride test was negative. The patient was continued on his feeding regimen; however, despite reaching goal caloric intake daily, he was losing weight. A CT abdomen showed complete fatty replacement of an enlarged pancreas, as well as signs of chronic disease, such as bone-in-bone appearance of the spine with marked paucity of the intra-abdominal and subcutaneous fat. Although the patient was without neutropenia or anemia, this imaging raised concern for SDS. A skeletal survey showed bony demineralization. A CT chest showed volume loss in bilateral lower lobes with patchy atelectasis. Extensive lab work showed abnormalities in immunoglobulins with severely low levels of vitamins A, D, E, K, amylase isoenzyme, and pancreatic isoenzyme. Two weeks into his admission, the patient developed neutropenia with absolute neutrophil counts of 284, 574, and 420. A nasogastric tube was placed and the patient’s feeds were fortified with Duocal. When the patient demonstrated two days of weight gain, he was discharged. Genetic testing results are pending.

**Discussion:** Since SDS is a rare disease that can mimic more common diseases, such as cystic fibrosis, myelodysplasia or leukemia, it is often a delayed diagnosis. Not all patients present with the classic triad of pancreatic insufficiency, bone marrow failure, and skeletal abnormalities. Neutropenia, often cyclic in nature, may not be evident initially. The absence of neutropenia should not exclude SDS from the differential diagnosis.
THE TRICHOBEZOAR: A HAIRY DIAGNOSIS

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**Introduction:** Trichobezoars are undigested accumulations of hair in the gastrointestinal tract and result from tricophagia, or the ingestion of hair. Trichophagia is a common component of trichotillomania, a chronic impulse-control disorder involving repeated hair pulling, usually to the point of alopecia. Trichophagia is seen in approximately twenty percent of patients with trichotillomania. The percentage of patients with trichophagia developing a trichobezoar is unknown but is thought to be small. Trichotillomania and trichophagia are most frequently encountered in young, female patients; although, they are thought to be underreported in the male population. Trichophagia is ritualistic, often including biting, chewing and sometimes, even swallowing hair. While trichotillomania and trichophagia alone are not inherently detrimental to one’s health, a trichobezoar can cause significant gastrointestinal sequelae and potential mortality. The following case outlines the diagnosis of a trichobezoar and its treatment.

**Case Report:** A 27 year old female presented to the emergency department complaining of an approximate one month history of abdominal pain, acutely worsening over the previous day. The pain awoke the patient from sleep and was accompanied by non-bilious, non-bloody vomiting consistent with partially digested food. At home, the patient administered rectal promethazine without relief. She had been previously evaluated in her family medicine clinic approximately three weeks prior for similar abdominal pain which was thought to be secondary to opiate withdrawal. She alleged, however, that she had not used opiates for approximately one month prior to this presentation and denied any other psychiatric history. Basic lab work was non-elucidating, and the patient’s nausea and vomiting were refractory to medication. A CT scan was performed in the emergency room which showed a large amount of material in the gastric lumen with resultant distension and was read as favoring a gastric bezoar on the radiology report. The patient was admitted for worsening abdominal pain, nausea, and parenteral pain control as well as gastroenterology consultation. Gastroenterology initially recommended treatment for an infectious etiology of the patient’s symptoms. Unfortunately, there was only minimal improvement throughout the first night of hospitalization. After initially denying the ingestion of non-food substances, including hair, three times during her admission, the patient ultimately admitted to hair ingestion. A member of the multidisciplinary patient care team, a PhD candidate in counseling, performed an in depth evaluation of the patient during which the patient revealed she has been treated for “trichotillomania” intermittently over the previous six years. During that encounter, the therapist witnessed the patient pulling and eating her own hair. Gastroenterology was re-contacted and an EGD was performed showing hair in the posterior oropharynx with a large trichobezoar obstructing the gastric lumen and preventing the endoscope from passing past the antrum. The bezoar was too large to be removed by endoscopic techniques, and general surgery was consulted who recommend open surgical extraction. The obstructive, seven pound trichobezoar was removed during an exploratory laparotomy the following day. The patient was started on fluoxetine with the guidance of psychiatry but refused inpatient psychiatric treatment. She was discharged home after recovering from her surgery and advised to follow up with her family physician for further evaluation and therapy for trichotillomania and trichophagia.

**Discussion:** This case is significant for diagnosing and recognizing the morbidity associated with trichotillomania and trichophagia. It is also important in highlighting the fact that a thorough past medical history including psychiatric history is important in clinical diagnosis. While there exists no definitive treatment for trichotillomania or trichophagia it is important to recognize that with the appropriate intervention, the development of trichobezoars should be preventable.
THE DRIER THE BETTER: DOES RISING CREATININE FOLLOWING ULTRA FilTRATION IN ACUTE DECOMPENSATED HEART FAILURE PREDICT READMISSION?

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Purpose: Hospitalizations for acute decompensated heart failure (ADHF) have been increasing and costs related to readmissions account for approximately 75% of the total cost of care. Ultrafiltration (UF) is increasingly being used for ADHF refractory to medications. Some studies have shown that UF is more efficacious in removing volume compared with loop diuretics in patients with ADHF. UF has also been shown to reduce hospitalization readmission rates. Nonetheless, UF can also result in increased serum creatinine levels. This study evaluates clinical outcomes and surrogate markers of ADHF among patients treated with UF in two large urban medical centers.

Methods: A retrospective study was conducted at Banner Good Samaritan and Banner Heart Hospitals between 1/1/2006-11/01/2012 identifying patients with ADHF who received UF. Continuous data are reported as means and standard deviations. A Mann-Whitney U test was used to compare differences in continuous variables.

Results: There were a total of 67 patients, 68.7% of whom were male. Caucasian patients constituted 82.1%. More than half (55.2%) of the patients were classified with severely reduced EF. Of the 67 patients, 43 had chronic kidney disease (CKD) and 22 patients developed acute kidney injury (AKI) during treatment. No loop diuretics were used in 30% of patients, all of whom were known to be previously refractory to diuretics. Nineteen patients (28.4%) were placed on dobutamine; 14 of these had a severely reduced EF. The serum creatinine increased by 0.30 (0.62), mean BNP decreased by 1675 (2897), and mean weight decreased by 7.4 kg (9.6). Overall, the readmission rate at 30 days was 23%. There were 6 in-hospital deaths. For the 61 patients who survived their admission, the 30-day readmission rate was 6.2% for the patients with AKI and 29% for those without AKI (p=0.064). Also, among the 61 patients who survived, there was no difference in 30-day readmission rates between those with CKD (22.5%) and those without CKD (23.8%). Those who died during the index hospitalization had a greater increase in serum creatinine than those who survived. In contrast, patients who survived and were subsequently rehospitalized within 30 days had a lesser increase in serum creatinine than those who were not rehospitalized. (Table 1).

Conclusion: An increase in serum creatinine during hospitalization for patients with ADHF treated with UF appears to be a predictor of in-hospital mortality, while a lesser increase seems to be predictive of 30-day readmission.

Table 1 Change in serum creatinine

<table>
<thead>
<tr>
<th>In hospital</th>
<th>death</th>
<th>30 day</th>
<th>readmission</th>
</tr>
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<tr>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>0.96 (0.39)</td>
<td>0.23 (0.15)</td>
<td>0.03 (0.22)</td>
<td>0.30 (0.20)</td>
</tr>
</tbody>
</table>

p=0.002 p = 0.035
IMPROVING THE IDENTIFICATION OF OBESITY IN THE OUTPATIENT SETTING

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Purpose: Obesity is an increasingly prevalent health problem and contributes to many medical problems causing morbidity and mortality in the adult patient population. The purpose of the project is to improve the identification of obesity as a medical problem in the outpatient setting. The proposed project is to increase the diagnosis and treatment of obesity by educating the residents about how to use existing NextGen tools related to BMI diagnosis and treatment. After implementing the education, the proportion of obese patients with the diagnosis of obesity will be reassessed.

Methods: Firstly, a retrospective chart review of fifty patient charts to identify the percentage of obese patients (BMI over 30) who had not been diagnosed with obesity was preformed. Following a 3 month waiting period, to ensure that education can be implemented, another retrospective review of 50 patient charts who had a clinical encounter since the initial education was implemented will be conducted to determine if a greater percentage of obese patients had been diagnosed with obesity. Inclusion criteria were patients with BMI>30 from randomly selected resident patient panel. Analyses performed will included chi-square tests.

Results: From initial retrospective chart review found that 66% (33/50) patients were obese. Of those obese patients only 21% (7/33) carried a diagnosis of obesity. Results following resident education are pending collection.
MEDICAL PREVENTION OF BARRETT'S ESOPHAGUS: EFFECTS OF STATINS AND ASPIRIN/NSAIDS

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Purpose: Barrett’s esophagus (BE) is a complication of gastroesophageal reflux disease (GERD) that is a precursor to esophageal adenocarcinoma. There is limited information suggesting that aspirin and nonsteroidal anti-inflammatory drugs (NSAIDs) can reduce the risk of developing BE. Statins have also recently been shown to reduce the risk of esophageal adenocarcinoma. However, there are no data on whether statins are associated with a decreased risk of BE. We analyzed medical records at a large veterans’ hospital to determine the effects of these substances on the risk of developing BE.

Methods: 250 patients with biopsy confirmed Barrett’s esophagus were compared with 250 controls with acid-peptic symptoms but no endoscopic BE, all identified retrospectively from medical records at the Phoenix Veterans’ Affairs (VA) Hospital. Medication histories were reviewed to determine which patients were taking statins or aspirin/NSAIDs prior to their endoscopic evaluation.

Results: A total of 38 women (8 cases and 30 controls) were initially included in the data, but then dropped to improve the homogeneity of the sample. Mean age at diagnosis was significantly older in the Barrett’s population compared with controls (61 vs. 56 years, P<0.001), with no difference in mean BMI (28.7 vs. 28.9, respectively). Independently significant factors for risk of BE were found with use of aspirin/NSAIDs (odds ratio 0.58, P=0.011), statins (OR 0.48, P=0.001) and age at diagnosis (OR 1.045/year, P<0.001). Age at diagnosis was associated with increased BE length (0.06 cm/year, P=0.002), and statin use was inversely correlated with BE length (-0.79 cm on statin, P=0.038). Long segment BE (3 cm or longer) was predicted by statin use (OR 0.46, P=0.005) and age at diagnosis (OR 1.03/year, P=0.041).

Conclusions: The usage of both aspirin/NSAIDs and statins appear to be associated with diminished risk of developing BE. The data are most robust for statins, which also lower the risk of long segment BE and the overall length of BE. Prospective studies of this topic are indicated.
NORMAL BONE HEALING AT BONE-IMPLANT SURFACE UNAFFECTED BY PRESENCE OF RESORBABLE IN SITU FORMING HYDROGELS

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Purpose: A promising approach for preventing infections on cementless implants is to use resorbable in situ forming hydrogels to deliver antibiotics. These hydrogels offer advantages for improved prevention of prosthetic joint infections: 1) efficient and sustained antibiotic release; 2) soft yet cohesive physical structure allowing for complete surface coverage and preventing the development of biofilm in isolated crevasses, and 3) rapid degradability allowing for normal bone healing. We have showed these hydrogels are capable of controlled antibiotic release, and have been found to not be cytotoxic to fibroblasts and osteoblasts. What has yet to be answered is how the degradation and disappearance of the material affects bone healing ingrowth, since the intended use of these materials is coating of joint replacement components. If the material prevents bony ingrowth, or is somehow toxic to new bone, then it would be unsuitable for this application.

Methods: Multiple locations on rabbits were utilized for the study of bony healing amidst the pNipaam hydrogel. The model mocked the extrusion of material created from driving an implant into the bone and the subsequent degradation and healing process. The lateral tibia heads and femoral condyles were accessed on four rabbits for a total of 16 bone-implant sites. Anatomical landmarks were accessed through a small anterior incision. The side of the tibia and side of the femur was drilled out to a depth of 8 mm with a tapered drill bit 6 mm in diameter. Control (normal saline), high dose, and low dose antimicrobial were added to hydrogel prior to implantation. The drilled hole was next filled with the assigned hydrogel and the implant driven into the hole in press-fit fashion. Wound soft tissues were approximated and skin closed with suture. Rabbits were euthanized at 8 weeks and multiple histology samples were taken from all bone-implant sites with the use of a bone saw, fixed in formalin, and then analyzed by a pathologist.

Results: Histological data was collected from all rabbit specimens and sites. Control samples, those in which normal saline were added to hydrogel at time of implantation, revealed normal appearing osteoid and bone growth up to the implant surface. No bone necrosis was evident. Analogous findings were seen in the samples with low-dose or high-dose antimicrobial added to the hydrogel at time of implantation. There were no findings suggestive of bone necrosis in any of the samples. Microscopic histology appeared similar in all groups with evidence of new osteoid production extending to implant surface indicative of expected normal bony healing.

Conclusion: Resorbable in situ forming hydrogels do not affect bony healing at or near the bone-implant surface of long bone in rabbits.
Abstract 8

**FLUID PENETRATION INTO ANTIMICROBIAL LOADED BONE CEMENT CORRELATES TO DRUG ELUTION**

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**Purpose:** Antimicrobial loaded bone cement (ALBC) is commonly used to manage orthopaedic infection for local drug delivery at the site of infection. Antimicrobials act as poragen in bone cement. They increase fluid penetration into ALBC and then are subsequently eluted into the local environment. The arrangement of insoluble particles and direct quantification of differences in drug elution from ALBC have only been studied through extended elution experiments, which are both expensive and time-consuming. It would be of great benefit to study fluid penetration as a more cost-effective and easily measurable means to quantify drug elution from ALBC, however the relationship between fluid penetration and elution is yet to be determined. A method for measuring fluid penetration into ALBC was previously described. We hypothesize that fluid penetration into ALBC correlates to the amount of drug eluted from the cement.

**Methods:** Simplex was formulated with either low-dose gentamicin (1g/batch) or high-dose gentamicin (10g/batch). Three samples from each batch were formed by pressing ALBC in dough-phase between two styrene sheets to a standard rectangular size of 4cm x 1cm x .1cm. Each sample edge was vertically milled and then hand sanded to a flush edge with the styrene sheet. The samples were then immersed in fast green food coloring in water (5 mg/mL) at hydrostatic pressures of 16 inch column of H20 and 4 inch column of H20 respectively. Fluid was allowed to penetrate the samples and they were removed for measurement of penetration at day 1,3,5,7,14,21, and 28. Fluid penetration was measured as a color change in the cement samples from white to green with progression of dye along the fluid front. A Nikon D40 camera with macro lens was used to take digital photographs of each sample at each time. Photos were analyzed using a MatLab algorithm that determines the border/fluid penetration front. ANOVA testing showed the difference between time and distance for each sample over time. For the elution arm of our study, both low-dose and high-dose gentamicin ALBC samples were immersed into phosphate buffered saline (50 mL). Samples from the fluid of each specimen were taken at times correlating to fluid penetration measurements (day 1, 3, 5, 7, 14, 21, 28). Fluid was exchanged following each measurement to maintain infinite sink conditions. Once all measurements were obtained, ninhydrin testing was used to detect gentamicin eluted from each sample at each time point.

**Results:** Fluid penetration was much greater for samples in 16cm of fluid than for samples in 4 cm of fluid at 7 days (p<0.001). Delivery was greatest on the first day and reduced after that as the rate of fluid penetration slowed.

**Conclusion:** Drug elution from bone cement can be correlated to fluid penetration into the cement. This allows the use of fluid penetration as a more affordable and convenient means to study drug elution from ALBC in order to eventually determine the ideal formulation and combination of antimicrobials to use when treating infection.
OUTCOMES OF SMART PHONE APPLICATION ASSISTED BOWEL PREPARATION FOR COLONOSCOPY

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Background: The success of a colonoscopy is largely based on the quality of bowel preparation achieved by the patient. Patients are given medications and instructions on taking the medications, and when to change their diet prior to the colonoscopy. The quality of the endoscopic exam is directly related to the quality of the bowel preparation completed by the patient. A sub-optimal bowel preparation can lead to compromised exams with missed polyps, an increase in procedure time, more frequent surveillance, and aborted exams. To increase the quality of bowel preps, a smart phone application was created. A patient would download this free app on to their smart phone. The patient would input the time, date, and medication chosen by the physician, and timed alerts would appear on the phone to alert the patient of the next step in bowel preparation. In addition to the alerts, the app would assist in bowel preparation by explaining the procedure, providing tips, and displaying pictures of preparation quality. This was the same information previously provided on paper. The purpose of the app is to lead to better bowel preps and to increase patient satisfaction.

Aim: To study the quality of bowel preparations in patients who use the assistance of a smart phone application.

Methods: The study was done in two phases. The first phase was prior to the release of the application. All patients were asked if they owned a smart phone and the likelihood of using the app. The endoscopist was blinded to their answers and the quality of preparation was scored using the Boston Bowel Preparation Scale (BBPS). In phase two, patients were alerted and given instructions on how to download the application. At time of the colonoscopy, they were asked if they used the application and their satisfaction with the app. Again, the endoscopist was blinded to the answers and scored the bowel prep using BBPS. Statistical analysis was done using the Wilcoxon signed-rank test.

Results: There were 326 patients in phase 1 of the study. Of them, 49% of the patients owned a smart phone (n=162). These patients were compared to the patients without smart phones (n= 164). There was no significant difference in the BBPS scores for patients with smart phones versus those without. The average BBPS for those with smart phones was 6.92 (SD 1.72) vs 6.76 (SD 1.79) for those without, p = 0.414. The early data shows app users (n=16) had average BBPS scores of 8.19 (SD 1.05). There is a statically significant improvement when compared to smart phone owners from phase one of the study, p =0.003.

Conclusions: Early data is promising showing a statistically significant improvement in bowel preparation quality in patients who used the smart phone application. The phase two data is being collected over the next months to see if this trend continues with a larger population.

<table>
<thead>
<tr>
<th>Patients</th>
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<tr>
<td>Phase 1 Smart Phone</td>
<td>6.92 (SD 1.72)</td>
</tr>
<tr>
<td>Using the app</td>
<td>8.19 (SD 1.05)</td>
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ENHANCING THE CAPACITY TO MENTALIZE BY SILENCING THE AFFECTIVE NOISE: A CASE REPORT OF A 27 YEAR-OLD WITH BORDERLINE PERSONALITY DISORDER

Theresa Nguyen, DO
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Introduction: The capacity to mentalize is the process of how humans make sense of their social world. Peter Fonagy popularized this concept of understanding one’s own and others’ behaviors in terms of mental states such as feelings, needs, desires, beliefs, and intentions. It involves being able to form mental representations of the self in relation to others with awareness that these perceptions of reality can be influenced by subjective factors. In normal development, the mentalizing system of the brain operates automatically starting at 18 months of age, and by ages 4-6 years old, it is capable of consciously discerning pretend from reality. Mentalization is built on secure attachment and early interactions with a caregiver who can treat the child as a mental agent to which mental states can be attributed. For borderline patients who have experienced trauma, neglect, or insecure attachment during childhood, the development of mentalization becomes disrupted rendering susceptibility to affective dysregulation. Emerging evidence suggests an association between trauma and hyperreactivity of the hypothalamic-pituitary-adrenal (HPA) axis, the neuroendocrine system that responds to prolonged stress with hypersecretion of glucocorticoids. HPA hyperactivity activates the autonomic nervous system, which may induce hypersensitivity to negative stimuli and hypervigilant mental states linked to internal representations of the self as victim and others as persecutors. These stress-response systems and associated negative affective states subsequently impair mentalizing capacity, leaving patients to resort to pre-mentalistic, maladaptive modes of operating such as relieving internal stress through angry outbursts or self-destructive/impulsive behaviors often seen in borderline patients. This is a case report of a female patient with Borderline Personality Disorder (BPD) who presented with recurrent hyperaroused states causing temporary loss of mentalizing capacity that was recoverable through supportive psychotherapy.

Case Report: A 27 year-old woman with prior history of BPD was admitted to an inpatient psychiatric unit status post intentional overdose with pills as an impulsive suicide attempt, which was triggered by a conflict with her significant other. During her hospitalization, the patient was involved with several altercations with peers and staff for similar interpersonal conflicts of which one episode resulted in a physical outburst. This prompted a multi-disciplinary team intervention to promote a safe environment for all patients. The patient met with her doctors, social worker, behavioral health tech, nurse, and nurse manager. When staff elicited details of what happened, the patient reacted with hypervigilance as she misperceived the questions from staff to be persecutory which made her feel victimized and abandoned. She then endorsed suicidal ideation and requested to leave against medical advice. Recognizing that the patient had lost reflective function, the attending physician postponed the intervention and shifted the focus to validating her intense emotions, mirroring her internal mental state, and facilitating her evaluation of mental representations of herself and of others in strict relation to context. As she no longer felt attacked, her hyperreactivity gradually subsided, which allowed her to switch from defensive mode back to mentalizing mode where she was able to generate alternative perspectives to a situation. Additionally, the supportive alliance improved her motivation to learn how to avoid her hyperarousal triggers and utilize self-coping skills.

Discussion: Psychotherapy can be combined with psychiatric medication to act synergistically in reversing HPA hyperactivity and diminishing the affective noise of hyperarousal mental states. Creating a therapeutic setting enhances a patient’s mentalizing capacity as it helps establish or reestablish a secure attachment relationship that is fundamental in forming the psychotherapeutic alliance.
COMPARISON OF SPEED AND ECONOMY OF MOTION BETWEEN CONTINUOUS AND INTERRUPTED SUBCUTANEOUS REPAIR TECHNIQUES

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Purpose: Both interrupted and running repair are popular clinical techniques for subcutaneous wound closure. There are numerous studies on topics such as knot strength, ultimate tensile strength, construct failure, and suture biomechanics. None of these studies have conclusively swayed the community that one technique is superior to the other. Advocates of interrupted suture cite additional risk of suture failure from relying on a few knots to maintain closure, whereas advocates of running suture discuss the improved speed and conserved materials. This study seeks to establish the relative efficiency difference between the two techniques in terms of path length and time to complete a 12 cm repair using each technique.

Methods: Fresh cadaver skin specimens were harvested for subcutaneous repair. Standard 12 cm incisions were made and then the subcutaneous layer was repaired with SH 2-0 Vicryl using either a continuous or interrupted technique. Each interrupted suture was placed at 1 cm intervals and each continuous throw was placed at 5mm intervals to equalize the number of throws for each technique. Four 2 mm diameter 180 model sensors were placed on the dorsal aspects of P1 of the thumb, P2 of the index finger, P2 of the middle finger, and on the radial styloid of the wrist. Motion Monitor was used to record 6DoF translation and rotation during closure of the incision. Data was exported to Matlab and analyzed with a custom algorithm. Path length and time to complete the repair were compared between both techniques using paired t-tests.

Results: The running repair had consistently smaller path length calculations, conserving motion by approximately 20% (35m average vs 45m average). The exception to this was the marker placed on the wrist on the left hand, which showed a 72 % greater translation during running suture than during interrupted suture (35m vs. 60m). Total time to complete the running suture was on average 4.6 minutes, more than a full minute less than the 5.8 minutes for the interrupted suture (p<0.001).

Conclusions: While both techniques may have benefits, there is a significant difference in the path length and time efficiency between running and interrupted suture.
Abstract 12

**DISSEMINATED HISTOPLASMOSIS WITH SECONDARY HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS IN AN IMMUNOCOMPROMISED HOST**

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Banner Good Samaritan Medical Center

**Introduction:** Histoplasmosis is the most prevalent endemic mycosis infection in the United States. Approximately 59% of patients with systemic histoplasmosis are immunocompromised. Histiocytosis is characteristic among patients with disseminated histoplasmosis; however, in rare cases, a unique immunologic response in which cytotoxic lymphocytes and activated macrophages become unregulated can occur. Hemophagocytic lymphohistiocytosis (HLH) is the accumulation of activated macrophages that are unregulated resulting in hemophagocytosis and organ damage. In children, HLH is a primary process, referred to as Primary Hemophagocytic Lymphohistiocytosis. However, in adults, the process is usually secondary and, often, the precipitant is never identified. The illness can manifest similar to that of severe sepsis or septic shock presenting with fever, progressive multi-organ failure, disseminated intravascular coagulation, hypotension, elevated transaminitis and pancytopenia.

**Case Report:** A 63 year-old male from Minnesota with a history of sarcoidosis managed with chronic steroids was transferred from an outside hospital. Since returning from Central America three weeks prior, he experienced fevers, diaphoresis, and lethargy. An initial evaluation out-of-state was negative for malaria and leptospirosis. A 7-day course of doxycycline had no effect. As symptoms were tolerable, the patient traveled to Phoenix. Over four days, the patient became progressively short of breath, lethargic, confused, and atactic. Upon arrival, a well-nourished male was oriented but extremely fatigued. He was febrile, tachycardic, tachypenic, and hypoxic. Bibasilar crackles and diffuse wheezes were present on lung exam. Left conjunctival hemorrhage, mild jaundice, and upper extremity petechiae and bruising were also present. Initial laboratory work-up demonstrated pancytopenia, transaminitis, acute renal insufficiency, and elevated inflammatory markers. Chest x-ray revealed bilateral patchy opacities. Computed tomography of the chest/abdomen/pelvis revealed mediastinal and hilar adenopathy, diffuse interstitial and airspace disease, small pleural effusions, and splenomegaly. A peripheral smear was negative. Ferritin was greater than 40,000 ng/mL. Shortly after admission the patient was transferred to the ICU for respiratory distress necessitating the use of BiPAP. Thorough microbiologic work-up and broad-spectrum antibiotics were initiated. A bone marrow biopsy was performed on hospital day 2, which revealed normocellular bone marrow with granulomas containing budding yeast, most consistent with histoplasmosis. Hemophagocytosis was also present. Fungal blood culture and bone marrow tissue culture later confirmed Histoplasma capsulatum. Amphotericin B was initiated on hospital day 3. Low dose etoposide was initiated on day 4 for HLH. Multi-organ dysfunction ensued by day 5 for which the patient required mechanical ventilation and continuous renal replacement therapy. He became more hemodynamically stable but hepatic functions deteriorated. Repeat bone marrow biopsy on day 10 demonstrated resolving hemophagocytosis but persistent histoplasmosis. Unfortunately early day 12, the patient had cardiac arrest and expired.

**Discussion:** Disseminated histoplasmosis and secondary HLH in a patient with known sarcoidosis on chronic steroids made the diagnoses of multiple processes in this patient challenging because symptoms of each disease overlap. The key to diagnosis was the bone marrow biopsy. The lack of calcifications in the liver or spleen suggested the histoplasmosis was acquired acutely and disseminated, likely due to the immunocompromise. Our patient's ferritin level was the biggest clue toward HLH. Unfortunately, there is limited data guiding the treatment of adults with disseminated histoplasmosis precipitating secondary HLH, and survival is rare.
Purpose: Though ankle replacement is becoming a more attractive option, ankle arthrodesis remains the gold standard for treatment of the end stage degenerative ankle. Many surgical techniques are available with variable fusion and complication rates. There is a growing trend towards arthroscopic ankle arthrodesis with proponents claiming less complications, faster time to fusion, decreased hospital length of stay and equivalent fusion rates. This paper is the largest known series using a single open technique for isolated ankle arthrodesis with a comparison to all available data on arthroscopic arthrodesis. All procedures were performed by the senior authors.

Methods: Ankle arthrodesis was completed on 157 consecutive adult patients, 103 males and 54 females, using the tension band technique. Age 66 years (31 to 86), BMI 29.5 (16-45). Comorbidities included patients with peripheral neuropathy (27), avascular necrosis of talus (8), diabetes (21), smokers at time of surgery (15), and immunosuppressed (16). Diagnoses include traumatic arthritis (77), primary degenerative arthritis (70), rheumatoid arthritis (6), hemophilia (3) and one patient with soft tissue loss after removal of sarcoma. 148 were primary procedures, 9 were revisions of prior fusion or arthroplasty. Sixty one patients had coronal plane deformity greater than 10o pre-operatively, with eleven patients greater than 25 degrees. Patients were followed until clinical and radiological union or nonunion. Patients were evaluated preoperatively and at one week, six weeks and three months postoperatively and intermittently thereafter.

Radiographs were reviewed by a musculoskeletal radiologist who was blinded to patient outcome or information to determine successful fusion, defined as bridging by bony trabeculae. Paired AOFAS scores were determined to be non-normal using the Anderson Darling test. AOFAS scores were compared using the paired sign test.

Results: Arthrodesis was radiographically and clinically solid in one hundred and fifty-five patients, for a fusion rate of 98.7%, which compares favorably to the published data on different techniques: open fusion rates 95% CI (88-93%), arthroscopic fusion rates 95% CI (91-95%). Average time to radiological fusion was 11.9 weeks. 155 of the 157 patients described their pain pre-op as moderate to severe. At 3 months, 110 patients reported no pain, 45 had mild pain, 2 had moderate pain and 0 patients reported severe pain. AOFAS scores improved from an average of 47(range 15 to 78) at pre-op to an average of 83(range 60 to 92, p<0.001) at 6 months.

Complications included five superficial infections that resolved with local wound care and antibiotics and two deep infections, one of which required a free flap. Three patients required revision, two for pseudoarthrosis and one for malunion. Hardware irritation occurred in seventeen patients, twelve requiring removal. One patient had a stress fracture at the proximal end of the plate.

Conclusion: The tension band ankle arthrodesis technique is a reliable method to obtain ankle arthrodesis regardless of comorbidities or preoperative deformity with an acceptable level of complications.
MOTION ANALYSIS USED TO OBJECTIVELY MEASURE IMPROVEMENT IN SURGICAL PERFORMANCE METRICS: A LONGITUDINAL STUDY

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Purpose: With recent changes in health care, a paradigm shift has been created in surgical resident education. Alternative methods to improve the surgical skills of trainees outside the operating room have been developed. Basic surgical skills form the backbone of surgery, and by learning these skills rapidly, more time will be available to focus on advanced surgical tasks. By being able to measure basic surgical performance metrics, it could be possible to help identify strengths or weaknesses amongst trainees. Motion analysis is one such tool that can be used to measure basic surgical performance metrics. The aim of this study is to determine the growth in basic surgical skills of surgical residents over a longitudinal time frame, as objectively measured with motion analysis technology.

Methods: Eight participants were recruited from various levels of surgical experience. Surgical performance was measured using 8 Ascension trakSTAR® Magnetic Trackers. Model 180 electromagnetic sensors were placed on each participant’s hands in uniform positions. Sensors were secured in place with adhesive under a surgical glove. Four tasks were completed: one-hand knot tying, two-hand knot tying, instrument knot tying, and running suture. All metrics utilized a cadaveric tissue model. Recording was performed with Motion Monitor Software, and path length and time were calculated with Matlab and Excel. Tasks were then repeated with each participant wearing cut-resistant fracture gloves and then brought back an average of 5 months later to repeat the above tasks. Performance was compared between participants, time points and across tasks. Student’s T-test was used to compare the time and path length of the non-fracture glove tasks to the tasks utilizing fracture gloves at both time points.

Results: Seven out of eight participants had a significant (p<0.05) increase in path length with the addition of fracture gloves in at least one of the four tasks at the time of initial measurement. Tasks that had increased path lengths were 2-hand knot tying and 1-hand knot tying. When re-measured 5 months later, all participants demonstrated improved time to completion and shorter overall path length with at least one of the surgical tasks. Amongst the less experienced participants, improvements in time to completion and path length were noted to be significant in both 1-hand knot tying and 2-hand knot tying.

Conclusion: All participants had shorter average time to completion and path lengths when repeating the tasks at time point two, suggesting learning/improvement in surgical skills had taken place. Participant with a higher level of surgical training were more readily able to overcome the addition cut-resistant fracture gloves to complete the tasks at both the initial measurement and at the repeated time point. More significant improvements in time and overall path length were noted amongst participants who were earlier in their surgical training, suggesting a plateau effect in performance of more experienced residents. Improvements in surgical performance metrics are able to be objectively measured with motion analysis over a longitudinal time frame.
A NEW HYDROLYSIS-DEPENDENT THERMOSENSITIVE COPOLYMER DOES NOT INHIBIT HUMAN OSTEOBLAST SURVIVAL OR MINERALIZATION

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Purpose: A morbid and debilitating complication in orthopaedic total hip and knee arthroplasty is prosthetic joint infection. Current modalities of treating these infections involve bead pouches or antimicrobial loaded cement spacers. These drug delivery systems utilize hard materials, which are limited by their wear debris and slow degradation, conditions detrimental to a moving joint. In contrast, hydrogels form in situ, molding to irregularly shaped implants and articulating surfaces and can locally deliver antimicrobials at desired concentrations. We have previously developed a viscous, water-rich gel based on a thermosensitive copolymer called PNDJ, which has multiple potential clinical utilities in orthopaedics. While it has been shown that this copolymer has the unique combination of controlled antimicrobial release properties (over 5-14 days), viscoelasticity, and degradability (within 2-6 weeks), the cytotoxicity of the copolymer’s degradation products remains unknown. Thus, the purpose of this study is to determine if PNDJ degradation products inhibit human osteoblast cell survival and mineralization at various concentrations in vitro.

Methods: Human osteoblasts were seeded at 8000 cells/cm² and grown until confluent in osteoblast growth media supplemented with ascorbic acid, dexamethasone, and gentamycin (Lonza, Inc). Mineralization in the confluent osteoblastic cultures was induced by the addition of beta-glycerophosphate. These cultures also contained varying weight-percent concentrations of PNDJ degradation products (0%, 1%, 2%, 4%, and 8%). The media was changed every 48-72 hours. At the end of 3 weeks, the cells were fixed with 3.7% formalin and stained with Alizarin Red, which identified mineralized calcium deposits as red spots. Micrographic visual inspection was utilized to determine osteoblast survival and function.

Results: At the end of three weeks, human osteoblasts were present and mineralization was observed at all concentrations of PNDJ degradation products up to 8 wt%.

Conclusions: Human osteoblasts survive and mineralize in vitro in the presence of varying concentrations of PNDJ hydrogel degradation products. Subsequent studies will aim to evaluate biocompatibility of PNDJ hydrogels in vivo.

Fig. 1: Micrographs of osteoblasts at the end of 3 weeks at all concentrations. Mineralization demonstrated by Alizarin Red, which stains calcified deposits.
Abstract 17

POVIDONE-IODINE AFFECT ON POLY(METHYL METHACRYLATE) FREE RADICAL POLYMERIZATION

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Purpose: Povidone-iodine (PVP-1) also known commercially as betadine is a stable iodophor chemical complex consisting of polyvinylpyrrolidone (PVP) and triiodide. Since its commercial introduction in the 1950s, PVP-1 has become universally accepted as an affective and useful antiseptic. The active agent triiodide is an oxidizing agent that acts as a broad spectrum bactericidal agent through iodination of lipids and oxidation of cytoplasmic and phospholipid membranes. Not surprisingly PVP-1 has found acceptance and use in orthopaedic procedures. Total joint arthroplasty is a common surgical procedure prone to infectious complications secondary to implantation of nonbiological materials. In an attempt to reduce the risk of surgical site infection dilute PVP-1 solution has been used by some orthopaedic surgeons to irrigate the surgical site after implantation of orthopaedic prosthetics. Poly(methylmethacrylate) (PMMA) known commonly as bone cement is used in many total joint arthroplasty procedures to fix the prosthetic joint bone interface. PMMA consists of preformed PMMA microspheres, methacrylate monomer, an initiator such as benzoyl peroxide (BPO) and a catalyst. The methacrylate monomer undergoes free radical polymerization trapping the preformed PMMA microspheres, forming an amorphous radiolucent material suitable for orthopaedic application. Oxidizing agents are known to inhibit or stop free radical polymerization of the methymethacrylate monomer. PVP-1 is a strong oxidizing agent that potentially may inhibit free radical polymerization of PMMA when exposed.

Methods: Three formulations with three batches each totaling 216 standardized test cylinders of bone cement were hand mixed in a standard fashion. The first group consisted of polymer powder, liquid monomer, and PVP-1. The second group consisted of polymer powder, liquid monomer, and water. The last formulation, the control was a standard mix of polymer powder, and monomer liquid. For each formulation five specimens per batch (n=15) were randomly chosen. The samples were placed under axial compression to failure at one day post mixing. Additionally the set time was measured for each formulation. Compressive strengths of each formulation were compared across cement types using repeated-measures ANOVA.

Results: Final results are still pending

Conclusion: PVP-1 is an oxidizing antimicrobial agent that has application in irrigating total joint arthroplasty shortly after implantation when PMMA may still be undergoing free radical polymerization. There is some concern that the oxidizing properties of PVP-1 may thereby weaken the prosthetic bone interface by inhibiting the free radical polymerization of PMMA. Although the PMMA surface area exposure to PVP-1 is minimal, and time of exposure is short the surgeon should consider the potential effect of using PVP-1. Further conclusions will be based on final results.
ADVANTAGES OF PERCUTANEOUS PINNING OVER SPLINT IMMOBILIZATION OF MALLET FINGER INJURIES

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Purpose: Splint immobilization and percutaneous pin fixation are both considered acceptable methods for treatment of most mallet finger injuries. While each technique has its own advantages and limitations no studies to date have identified an explicit indication of one over the other for most mallet injuries. The purpose of this study was to compare the objective measurements, functional outcomes, patient satisfaction, complications, and overall cost of the two treatment options.

Methods: Between 2003-2011, 62 patients were treated for mallet finger injuries by one physician, 44 with splinting and 18 with pinning. Patients chose between the two treatment options after being presented with both. In 2012, following IRB approval, a chart review was performed to gather the prospectively collected data on pre-treatment and post-treatment extension lag as well as to tally total physician and therapy visits for cost analysis and to review notes for complications. Patients were also contacted anew and seen in the office or mailed a packet of instructions to obtain up to date information on residual deformity, to complete a functional outcome evaluation, and to assess overall satisfaction. Not all patients could be reached for updated information as of 2012 but were included to the extent that they had follow-up in the chart. Analysis was performed using the Mann-Whitney U test.

Results: In the splint group, final average extensor lag was 11°, whereas in the pin group, it was 4.7 (p=0.001). Hand therapy visits averaged 5.3 (range 0-21) in the splint, and 4.6 (range 1-9) in the pin group (no significant difference). Average treatment cost was considerably higher in the pin ($15925) compared to the splint group ($5651). When asked whether they would choose the same treatment again, 28/28 patients in splint, and 7/8 in pin group answered affirmatively. 5 complications occurred in the splint group (10%): swan-neck deformity (n=2), complex regional pain syndrome (n=1), boutonnière deformity (n=1), pressure ulcer (n=1). In the pin group, 3 complications occurred (17 %): cellulitis (n=1), pin loosening requiring removal (n=1), and swan-neck deformity (n=1).

Conclusions: Splint and percutaneous pinning are both well-tolerated, effective treatments for most mallet finger injuries - both produce a significant correction of extensor lag, require little formal therapy, and have high patient satisfaction. Percutaneous pinning allows better correction of extensor lag and a smaller degree of final extensor lag, but is more expensive. It may be justified, despite cost, in patients with multiple digit involvement, individuals with delayed presentation who would require more prolonged splinting, or professionals (surgeons, dentists) who would have difficulty working with a splint, people who work in a moist or wet environment, or individuals (musicians) less tolerant of an extensor lag.
Abstract 19

EOSINOPHILIC MENINGITIS CAUSED BY ANGIOSTRONGYLUS CANTONENSIS

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Introduction: Angiostrongylus cantonensis is a roundworm that causes Angiostrongyliasis, the most common cause of eosinophilic meningitis in Southeast Asia and Pacific basin. This parasite resides in the pulmonary arteries of rat lungs and is known as rat lungworm. Snails are the primary intermediate host; whereas, humans are incidental hosts through ingestion of larvae found in raw or undercooked snails, vegetables and contaminated water.

Case Presentation: A 29 year old Caucasian female with history of a 4 day grueling treasure hunt in Fiji where she drank river water and ate snails developed waxing and waning symptoms of diarrhea, constipation and urinary retention progressively for about 4 weeks. She was finally admitted after she developed profound weakness and ended up on the floor of the ER from intense pain. Lumbar puncture was completed and CSF study was done, which showed presence of eosinophilia. Patient was diagnosed with eosinophilic meningitis due to angiostrongyliasis and treated with corticosteroid, anthelmintic, opioid, gabapentin and repeated lumber punctures. Patient’s condition improved significantly within 24 hours and continued to improve over a one month period.

Discussion: Angiostrongylus cantonensis is a rare parasitic infection in the United States except for Hawaii. Generally a self-limiting disease that resolves with supportive treatments; however, many recent studies performed, including randomized controlled trials, have reported treating with an anthelmintic and corticosteroids either improved outcome or had no effect. This is contrary to the belief that treating with anthelmintic could lead to release of inflammatory mediators which would exacerbate the patient’s symptoms. This case shows that the use of anthelmintic with corticosteroids should be used to treat patients with eosinophilic meningitis. Preventing infection by Angiostrongylus cantonensis can be done by avoiding consumption of contaminated vegetables, raw and undercooked snails, freshwater shrimp or crabs and contaminated water.
IMPROVING MAMMOGRAM SCREENING NUMBERS IN THE AMBULATORY MEDICINE CLINIC THROUGH REMINDERS

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Purpose: Breast cancer is the second leading cause of cancer related deaths in women. Studies have shown 15.3% increase in adherence to mammograms when patients are contacted through calls and reminders. Other studies found that a recommendation by a physician is a strong determinant of whether a woman receives a mammogram. The purpose of this study is to improve the number of women over age 50 that are up to date on their screening mammograms through reminder calls and letters.

Methods: There was a two phase project- phase 1 was June-July 2012, phase 2 was January-February 2013. In phase one of my project, June/July 2012, I constructed and implemented a protocol for which all the residents in ambulatory clinic were to follow an audit tool (flow diagram and excel sheet) to see if the female patients in their panel had up-to-date mammogram screenings. They were to contact their patients about mammogram screening and write the names of the females >50 year old contacted onto a excel-type worksheet with the date of previous mammograms. They were able to do so by receiving a “patient panel” of their own patients from their preceptors. By way of a flow diagram that I created for the residents to follow, they audited all their female patients by phone call, LPN, or letter. Phase 2 in January-February was to make follow up calls and update the audit tool on those who had completed their mammograms.

Results: Overall, the mammogram screening was 37.2% up to date in clinic for the initial run of the study. Out of 38 residents were participated in the study, there were a total of 235 patients called and 8 refused mammogram. We hope that by Phase 2 follow-up, the screening number will increase. Interestingly, according to the data, female residents were 43.4% compliant, as opposed to males who were 29.4% compliant to performing the audit on mammograms. By residency year, PGY1 were 52% compliant with audit, PGY2 were 34.7%, and PGY 3 were 35.5%. Further breakdown by males and females per residency year shows PGY1 females 72.2 to be compliant, males 26.7; PGY2 females 29.7, males 40.7; PGY3 females 50.9, males 13.1 %. Limitations to the study included, but not limited to- inability to reach the patient, residents not turning in their audit forms, patients refusing mammograms for various reasons.

Conclusion: To be determined, but it is my hope that the phase 2 follow-up will show an improvement in mammogram screening numbers after phone call and letter reminders to patients. I also noticed that overall PGY1 residents were more likely to complete their tasks than PGY2 or PGY3. It is unclear why this is the case other than perhaps first years are possibly more compliant. This may be important for any future research tasks given to residents to perform.
**THIS JUST IN: MEDICINE IN THE MEDIA**

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**Purpose:** In 2011 an average of 22.5 million people regularly watched one of the three commercial broadcast evening news programs on ABC, CBS or NBC. Medical stories are a regular part of these news productions, however, the quality of these stories has not been studied. Healthnewsreviews.org has published a tool used to judge stories in the written lay media but a similar tool has not been developed for visual media. Our patients commonly ask us about stories seen on the news and ability to evaluate the evidence base for these stories and educate our patients about the evidence quality would be valuable for a primary care physician.

**Methods:** We developed a tool to “rate” quality of the news stories modified from the tool used in healthnewsreview.org. Ten criteria chosen for the tool included such factors as cost, benefit, harms, freedom from conflict of interest, and avoidance of sensationalized language. Two physicians screened 15 stories for qualitative information, and we formally pilot-tested our rating tool with 8 physicians and 3 news stories from the three major broadcast networks.

**Results:** The average length of a medical news story is 129 seconds. Qualitative findings include frequent use of the words “new” and “miracle,” an exaggeration of the importance of new developments, and a lack of information about how widely and when a treatment will be available. Quality scores ranged from 61-78%, with a maximum possible score of 100% meaning all physicians felt the story to be adequate in all criteria. We calculated kappa scores for each story to determine inter-observer agreement. These ranged from 0.52 (moderate agreement) to 0.69 (substantial agreement).

**Conclusion:** The quality scores given to national television news broadcasts indicate that there is room for improvement in terms of physician evaluation if they are to present medical stories in a manner that contributes to the health of the public. Public health experts, physicians and journalists should collaborate to improve the quality television news health stories. Physicians can use this information to help our patients be more informed consumers of health information.
Bilateral Coronary Artery Fistulas Communicating with the Left Ventricle

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Introduction: Coronary artery fistulas (CAF) are uncommon congenital or acquired vascular malformations. These fistulas usually arise from one of the major coronary arteries. The presence of bilateral coronary artery fistulas is rare. Even more rare are the communications of coronary artery fistulas into the left ventricle as they usually drain into the right ventricle or pulmonary trunk. The importance of these anomalies pertains to the wide spectrum of their clinical presentation, varying from asymptomatic to life threatening scenarios. CAF have been described to cause various complications including myocardial ischemia, ischemic cardiomyopathy, congestive heart failure, bacterial endocarditis, premature atherosclerosis, secondary mitral and aortic valve disease, and sudden cardiac death. This case report describes the rare occurrence of bilateral coronary artery fistulas (arising from both left and right branches of the coronary arteries) that communicate with the left ventricle.

Case Report: A 50-year-old woman presented with occasional episodes of recurrent chest pain and pre-syncope. She was also known to have diastolic heart failure and interstitial lung disease, status-post lung transplantation seven years previously. Her physical examination and laboratory workup on admission was completely normal. ECG disclosed nonspecific ST-T wave abnormalities in the inferolateral leads. Telemetry monitoring did not show any evidence of arrhythmia to explain pre-syncopal episodes. Echocardiogram showed only mild concentric left ventricular hypertrophy and mild pulmonary hypertension. A dobutamine stress test obtained revealed no regional wall motion abnormalities or evidence of reversible ischemia. Diagnostic coronary angiography revealed a communicating fistula between the distal portion of the diagonal and left ventricular cavity. Furthermore, the right coronary arteriogram showed a small thick communicating fistula between the distal portion of the posterolateral and the left ventricle. The patient was managed with optimal medical therapy, including nitrates and calcium channel blockers without proceeding to coil embolization. Three months after diagnosis, the patient remained asymptomatic without recurrent chest pain or pre-syncopal episodes.

Discussion: CAFs may develop due to persistence of sinusoidal connections between the lumen of the primitive tubular heart, supplying myocardial blood flow. Typically, CAFs arise from a single artery, most frequently the right coronary artery. CAFs most frequently drain into the right side of the heart (the right ventricle being more common than the right atrium) and the pulmonary trunk, therefore creating a left-to-right shunt of oxygenated blood back to the pulmonary circulation. It is rare for CAFs to terminate into the left ventricle, making our case even more unusual. Physiologically, this causes hemodynamic changes equivalent to aortic insufficiency. The significance of these rare vascular formations is that they bypass the myocardial capillary bed, shifting the hemodynamics of myocardial perfusion and potentially cardiac output. As the number of interventional procedures increase, the incidence of acquired CAFs increases. Therefore, this prompts further investigation into these rare, but potentially lethal vascular malformations. However, it is important to understand the features of these rare CAFs, in order to recognize atypical anatomy when it is presented the cardiac catheterization. As seen with our unique case, bilateral CAFs may display simultaneous termination in the left ventricle.
WATER-TIGHT WOUND CLOSURE: A COMPARISON OF INTERRUPTED VERSUS RUNNING DERMAL REPAIRS

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PURPOSE: There is strong evidence to do layered wound closures to both control dead space and redistribute tension in the wound. Closing the dermal layers can be done in a variety of manners. A common practice is using interrupted sutures in the hypodermis that incorporate the deep dermal tissue. Another means is using a running suture technique along this deep dermal border. Each technique has theorized benefits. One possible benefit of a running repair is better tissue apposition and a more water-tight wound. The purpose of this study is to evaluate running versus interrupted repair in regards to the leak rate.

METHODS: A standardized incision was made into a cadaveric skin model and the deep dermis was repaired using either interrupted or running technique. Repairs were done with 2-0 polyglactin 910 sutures (Vicryl™) on an SH-1 needle. Interrupted sutures were placed at one centimeter intervals while individual throws of the running repair were 0.5 centimeters apart. The repaired skin was placed over a measuring receptacle and a standardized amount of fluid was poured on the adipose side of the repair and measurements were taken on the amount of liquid that leaked through the wound. If no fluid leaked, the column of water depth was increased to increase the pressure until a leak occurred. The statistical analysis is pending.

RESULTS: (Pending results)

CONCLUSIONS: (Pending results)
RALSTONIA SPECIES CAUSING INFECTIOUS ENDOCARDITIS WITH COMPLETE HEART BLOCK ASSOCIATED WITH PERIVALVULAR AORTIC ABCESS

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Introduction: Infectious Endocarditis (IE) is a disease, that despite medical technological advances during the past century in diagnosis, medical therapy, and surgical treatment, the morbidity and mortality rates have not changed substantially. The current in-hospital mortality rate for patients diagnosed with IE is approximately 15-20%, with a 1-year mortality rate approximately 40%. Myocardial abscess caused by Ralstonia species is rare. Herein this article, we report a case in which Ralstonia species caused infective aortic valve endocarditis, myocardial abscess, and complete heart block. This organism has not been previously reported as an etiology of infective endocarditis.

Case Report: A 51-year-old female with a past medical history of deep vein thrombosis, pulmonary embolism and diabetes mellitus type 2 presented after several days of worsening chest pain. Pain was described as sharp and localized to the mid-sternal area. Chest pain would worsen with inspiration and coughing. She experienced persistent low-grade fevers and chills. Three weeks prior to presentation, patient underwent left tarsal tunnel release. The procedure was well tolerated and there were no symptoms reported prior or during the procedure. At time of presentation, the patient’s vital signs were as follows: heart rate of 48, blood pressure of 106/54 and temperature of 101.3°C. She underwent computed tomography (CT) angiogram that revealed no new blood clots, but showed cavitary lesions suggestive of septic emboli. Blood and urine cultures were obtained, and the patient was initiated on empiric antibiotic therapy. An ECG showed accelerated junctional escape rhythm.

A transthoracic echocardiogram (TTE) was performed and showed a bicuspid aortic valve with evidence perivalvular abscess. Transesophageal echocardiogram (TEE) was then performed and confirmed the above findings with the evidence of aortic valve thickening on the left coronary cusp highly suggestive of vegetation and associated severe aortic regurgitation. Furthermore, there was echo density of the aortic root with color flow transmitting through, which was highly suggestive of an aortic root abscess. There was moderate mitral valve regurgitation with normal left ventricular systolic function. The patient was referred to emergent cardiothoracic surgery with replacement of the aortic valve with a 19 mm freestyle tissue valve, incision and drainage and debridement of the subannular abscess, reconstruction of the proximal anterior leaflet of the mitral valve and aortic annulus with pericardial patch placement.

Forty-eight hours after admission, blood cultures demonstrated Ralstonia species. Repeated blood cultures each consecutive day until day of surgery revealed persistent bacteremia with Ralstonia species. All blood cultures after surgery were negative for any organism. Aortic valve and annular abscess samples were sent for culture and both resulted in heavy growth of Ralstonia species.

While the patient was recovering from cardiac surgery, she underwent teeth extractions due to the finding of multiple necrotic appearing teeth with caries. Furthermore, one week after cardiac surgery, she underwent dual-chamber pacemaker placement for 3rd-degree atrioventricular heart block prior to discharge.

Discussion: Patients with health care-associated infections is an emerging population that is at increased risk for developing infective endocarditis. It should be known, that patients with health care-associated infections or who have had recent hospitalization or medical intervention (as in our case) are a new risk group that requires careful diagnostic attention in the presence of fever and bacteremia to evaluate infective endocarditis.
Abstract 25

METHAMPHETAMINE-INDUCED LATENT SCHIZOPHRENIA

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Introduction: Schizophrenia can be unmasked by many different exogenous triggers. A recent large cohort study of California inpatients without a history of psychiatric disorders found that those with methamphetamine-related conditions were 9 times more likely to have a subsequent schizophrenia diagnosis than non-drug users, and an almost 1.5- to 3-fold diagnosis risk compared with heavy users of cocaine and opioids.

Case Report: A 19-year-old Hispanic female with no previous psychiatric history was admitted for disorganized psychosis after recent first-time use of methamphetamine. The family denied knowledge of family history of psychiatric conditions. MRI was unremarkable. The treatment team proceeded with diagnosis of psychosis NOS. The patient was started on olanzapine and lorazepam. She remained disorganized, intrusive and labile requiring constant intervention and physical restraints. Divalproex sodium and haloperidol were started and other medications were titrated down and eventually discontinued. The patient had improvement in mood, affect, insight and behavior. On the day of discharge, the patient was future oriented, denied SI, HI, hallucinations or delusions. She was readmitted three days later for worsening psychosis after discontinuing her medications. The patient's psychosis was present to the same degree as on her initial admission. She was restarted on home medications. Doses were increased without any clinical improvement and patient developed dystonia and hyperammonemia. She eventually had marginal improvement with regimen of haloperidol, olanzapine, divalproex sodium and lorazepam. The patient continued to have minimal insight into disease state and became increasingly focused on discharging home, and thus was not completely forthright with her symptoms of paranoia and psychosis. She was discharged home under the care of her father against medical advice.

Discussion: Given the persistence of symptoms distant from substance use and the rarity of permanent psychosis caused by first time use of methamphetamines, the most likely etiology of psychosis was latent schizophrenia exacerbated by exogenous substance use. This report focuses on treatment resistant psychosis that can persist without appropriate early intervention and medical compliance.
Abstract 26

GOUT: AN UNCOMMON PRESENTATION OF GOUT IN AN ELDERLY MALE

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Introduction: Gout is a common metabolic condition in which monosodium urate crystals are deposited into the joints and soft tissues. This deposition leads to inflammation that causes the clinical manifestations of gout which include warmth, pain, redness, and swelling. The majority of cases are confined to a single joint, but a small percentage may cause symptoms in multiple joints along with systemic symptoms.

Case Report: We report the case of an atypical presentation of gout in an elderly male who was admitted to the hospital with the chief complaint of lower extremity weakness. After several days of his hospitalization and multiple sub-specialty consultations, he was eventually diagnosed with gout. Treatment for gout was initiated and he noted an improvement in his symptoms instantaneously.

Discussion: By understanding that gout is not always limited to a single joint may lead to a more rapid diagnosis and subsequent resolution of symptoms. This prompt resolution of symptoms will help the patient regain quality of life quickly from a disease that causes intense pain and disability. The course, treatment, and long term management of gout will be discussed herein.
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DO QUORUM SENSORS ACT SYNERGISTICALLY WITH ANTIBIOTICS TO DISRUPT BIOFILM GROWTH?

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Purpose: Biofilms are a collection of microbes created by cohesive bacterial signaling and are characterized by both resistance to antibiotics and their ability to resist the host’s innate defense mechanisms. Previous studies have shown that a biofilm’s communication is controlled through the exchange of small, soluble proteins or “quorum sensing”. Previous experiments have also suggested that as biofilm grows, it begins in an uncoordinated “immature” state and undergoes cellular changes that render it more “mature” and less susceptible to destruction. A new technique to combat biofilms is to inhibit these quorum sensors and disrupt the stability of the biofilms allowing for its dissolution. It is unknown how effective quorum sensing inhibitors will be at preventing biofilm formation, or if the maturity of the biofilm when it is exposed to QSI will affect the response. Additionally, it has not been established how the maturity level of biofilm at the time it is subjected to antibiotics affects its growth. We hypothesized that QSI and antibiotics would maximally affect biofilm growth during its immature phase and furthermore that they would have synergistic effects in preventing mature biofilm formation.

Methods: This experimental study used Staph aureus (UAMS1, ATCC 49230) as well as Staph epidermidis (ATCC 35984). Media was created using a TSB solution with 1% glucose added. Bacteria was inoculated overnight and added to media using a 1/100 dilution. Following an established biofilm screening protocol, 200 microliters was added to each of 8 wells per group in a 96 well plate. Experimental groups included control, (media+bacteria), bacteria + addition of 100 uL gentamycin at time 0 and 24 hours, addition of 100 uL hammemiltannin at 60 ug/mL at 0 hours, and addition of QSI at 0 hours with gentamycin added at 24 hours. At 48 hours, wells were stained with (0.1%) crystal violet stain in water and imaged. The stain was then solubilized with 95% ethanol, and its absorbance was measured at OD 500 to quantify biofilm growth. Primary outcome was abs_{500}.

Results: Control bacteria grew biofilm normally. Biofilm growth was less (p<0.05) in wells containing gentamicin and hamamellannin. There was significant well to well variability and additional replicates are being run to determine if there is meaningful strain to strain variability.

Conclusion: Preliminary data has shown that biofilm can reproducibly be created using an in vitro well plate model. Furthermore, compared to controls, bacteria subjected to Hammemiltannin show less biofilm formation. Finally, bacteria with a QSI and antibiotic added have substantially decreased biofilm formation. Our preliminary data supports the hypothesis that Hammemiltannin acts synergistically with gentamycin to inhibit biofilm formation in an in vitro model.
INFILTRATING CUTANEOUS SQUAMOUS CELL CARCINOMA
MISTAKEN FOR OSTEOMYELITIS

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Introduction: Cutaneous squamous cell carcinoma (cSCC) is the second most common skin cancer and occurs when epidermal keratinocytes undergo malignant proliferation. Most reported cases of bone infiltration by cSCC are to the skull—there are very few reporting bone infiltration to other sites. Areas of skin subjected to trauma, especially full thickness burns, are at increased risk for developing cutaneous malignancies, most commonly cSCC.

Case Presentation: A 49 year-old male with a past medical history of scleroderma and pulmonary hypertension presented to the emergency department unresponsive and was found to be in septic shock with multisystem organ dysfunction thought to be secondary to an infected left foot wound. History obtained from acquaintances and chart review suggested that the wound began as a burn injury and had been present for many years. The patient had been followed by a wound clinic at the time of his original injury, however had ceased all health care follow up for more than a year. Per history, the patient had chronic bleeding from the wound. In the emergency room, he was profoundly hypothermic and hypotensive and physical exam was notable for an extensive left foot ulcerating wound with macerated and necrotic tissue. Admission labs were significant for a leukocytosis, with a white blood cell count of 27,800/MM³ and severe microcytic anemia, with a hemoglobin of 3.2 g/dL. Plain films of the left foot showed extensive soft tissue erosion consistent with osteomyelitis extending proximally to the tibia and fibula. He was aggressively resuscitated and placed on broad spectrum antibiotics. He eventually underwent left-sided above the knee amputation once he was stabilized for surgery and had significant improvement in his organ dysfunction. Pathology of the wound was reported as infiltrating, well-differentiated squamous cell carcinoma of the foot with associated ulceration and necrosis, with squamous cell carcinoma extending to invade the underlying bone. All surgical margins were negative for malignancy and necrosis.

Discussion: Chronic, non-healing, ulcerating wounds in the region of previous or chronic trauma should raise suspicion for cSCC. This cutaneous malignancy can have a rather dramatic presentation, but will rarely metastasize. Early surgical intervention can reduce the risk of deep tissue or bone infiltration as well as metastasis.
A RARE COMPLICATION OF AN INCREASINGLY COMMON DISEASE

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Introduction: Hemolytic uremic syndrome (HUS) is a disease entity characterized by microangiopathic hemolytic anemia, thrombocytopenia and acute renal failure. Though rare, it usually follows gastroenteritis secondary to cytotoxin-producing gram-negative bacteria, most commonly escheria coli (e. coli) O157:H7. HUS has been linked to other pathogenic organisms and there have been rare case reports of HUS following clostridium difficile (c. difficile) infection. With the rapid increase in incidence of c. difficile infection, it should be considered when anemia, thrombocytopenia and renal failure occur in this setting as prompt initiation of treatment is critical to a favorable outcome.

Case Presentation: A previously healthy 21-year old female presented with two days of bloody diarrhea. She had recently been prescribed trimethoprim/sulfamethoxazole for acne and was in her first week of antibiotic therapy when her symptoms began. In addition to bloody diarrhea, she complained of abdominal pain and nausea. On presentation she had a profound leukocytosis and was diagnosed with severe c. difficile infection, with recent antibiotic use being the risk factor for occurrence. A few days into her hospitalization she developed anemia and notably had schistocytes on her peripheral smear. She also developed thrombocytopenia, with a platelet nadir of 16,000, as well as a rise in serum creatinine. At this point, a diagnosis of HUS was considered and both hematology and nephrology agreed that she needed to begin daily plasmapheresis for treatment. Given the rarity of HUS associated with c. difficile infection, shigatoxin testing was done to exclude concomitant e. coli infection and was negative. She had a prolonged clinical course but ultimately improved with therapy. After 10 days of plasma exchange, her blood counts stabilized and she was discharged home with close outpatient follow-up.

Discussion: This case is notable in that there are just a few case reports of HUS related to c. difficile. It is hypothesized that the mechanism involves the endothelial cell dysfunction, a characteristic feature of HUS, induced by c. difficile toxin A. In addition to demonstrating a severe and incredibly rare complication of an increasingly common disease, this case exhibits the harmful potential of antibiotic use and reinforces the principle that antibiotics be should used judiciously.
SUPPURATIVE THYROIDITIS AND HYPERTHYROIDISM IN A PREVIOUSLY HEALTHY 60 YEAR OLD MALE: A CASE REPORT

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Introduction: Suppurative thyroiditis (ST) is a rare disorder caused by an infection of the thyroid gland and can be life-threatening. The thyroid gland is usually resistant to infection given the high iodine content, high vascularity, and capsule around the gland. In case reports of adults with ST, there is often an associated underlying anatomic abnormality such as an adenoma or a goiter. The most common organisms which cause ST are bacterial, including streptococcus and staphylococcus. ST presents with sudden onset of pain and firm, tender and warm swelling in the anterior neck that moves on swallowing and patients can have associated hoarseness, dysphagia and dysphonia. Symptoms develop over days to a few weeks and often arise after an upper respiratory infection or pharyngitis. Untreated bacterial ST untreated has a mortality rate of 12%. Bacterial ST is associated with an euthyroid state in 83% of cases. Fungal thyroiditis is associated with hypothyroidism in 62% of cases and mycobacterial is associated with hyperthyroidism in 50% of cases.

Case: A 60 year old male with history of hypertension, coronary artery disease, and hyperlipidemia presented to a medical facility with a 5 day history of anterior mid line neck swelling, erythema, pain, dysphagia, subjective fevers, diaphoresis and 14 lb unintentional weight loss. Prior to his neck swelling, he was treated with 10 days of clarithromycin for clinically diagnosed bacterial sinusitis which responded well to treatment. On presentation, he had a large anterior erythematous and painful swelling overlying the cricoid cartilage. CT scan demonstrated a complex fluid collection in the anterior neck/thyroid bed. Thyroid ultrasound confirmed the fluid collection, which measured 6.7 x 4.9 x 6.8 cm. His TSH was <0.01 mIU/L and T4 was 4.4 ng/dL. His admission vital signs included temperature of 37.0 degrees Celsius, pulse 98, blood pressure 155/80 mm Hg, and respiratory rate of 20 per minute. He was admitted to the intensive care unit with concerns that he might develop airway compromise and any intervention causing thyroid storm. He was taking beta-blockers as an outpatient which likely dampened some of the systemic manifestations of hyperthyroidism on presentation. He was treated with propothiouracil, propranolol, saturated solution of potassium iodide, and intravenous dexamethasone to cool off the hyperthyroidism as fast as possible in case urgent surgery might be needed, but we did not ever feel he was in thyroid storm. His ST was treated with Clindamycin and Vancomycin and narrowed to Vancomycin after culture grew methicillin resistant staphylococcus aureus. Interventional radiology performed a fine needle aspiration and placed 2 drains and 20 milliliters of rust colored purulent material was removed. Serum thyroglobulin and anti-microsomal antibodies are negative, but the TSH receptor antibodies, which are specific to Graves’s hyperthyroidism are still pending. Culture of the fluid grew methicillin resistant staphylococcus aureus, sensitivities pending. Thyroglobulin level of the fluid is also pending to confirm that the mass is truly a thyroid abscess and not simply in the nearby soft tissue. Otolaryngology is planning biopsy and/or possible thyroidectomy once inflammation has subsided.

Discussion: Hyperthyroid state in the setting of a rapid onset bacterial ST draws attention to this case. ST is a rare but important diagnosis to consider along with subacute granulomatous thyroiditis and chronic thyroiditis in a patient presenting with thyroid inflammation. Recognition of the cardinal features of ST is essential in order to start timely treatment int his potentially devastating disease. Treatment was complicated by hyperthyroidism in this case. ST is associated with branchial cleft abnormalities in children, but is associated with underlying adenomas, malignancies, and goiters of the thyroid gland in adults.
CONTROLLED RELEASE OF ANTIMICROBIAL SURROGATE FROM BONE CEMENT IN VIVO

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Purpose: Musculoskeletal and peri-prosthetic infections are difficult and costly to treat. The current standard of care for managing these infections involves the local delivery of high concentrations of antibiotics using bone cement. Despite the widespread use of antimicrobial loaded bone cement (ALBC), little is known about the elution characteristics of these drugs in vivo. Prior studies suggest that concentrations of antibiotics may be detected in close proximity to ALBC for several weeks following implantation. The purpose of this study is to trace an MRI detectable antimicrobial surrogate, gadolinium-3-diethylene-triamine-pentaacetic acid (Gd-DTPA), to determine the distribution of a locally delivered agent over a period of 5 days after implantation.

Methods: Implantable local delivery depots were mixed using a clinically relevant mixture of polymethyl methacrylate (PMMA or bone cement) and Gd-DTPA as an antimicrobial surrogate. This study employed 2.9wt% Gd-DTPA as the payload with 11wt% of Xylitol as a particulate porogen to improve efficiency of Gd-DTPA release. As the cement mixtures hardened, they were shaped into 1cm cubes (or 4mm diameter rods) that were then implanted surgically into cortical bone defects (or the intramedullary space) created in the femurs of two New Zealand White Rabbits. After surgery, the rabbits underwent daily MRI scans to trace the elution of Gd-DTPA. After five days, the animals were euthanized and autopsies were performed to confirm appropriate depot positioning.

Results: Each in vivo study demonstrated maximal Gd-DTPA distribution at one hour after implantation. The detectable amount of Gd-DTPA (>14ug/mL) decreased rapidly over the subsequent days until day five, at which point the detectable volume had contracted to the size of the depot itself. The below images depict the reduced volume of detectable Gd-DTPA between day one and day five.

Figure 1. Distribution area of Gd-DTPA >14ug/mL

Day 1                                      Day 5

Conclusion: The results from this study show that concentrations >14ug/mL of Gd-DTPA are nearly undetectable beyond five days after implantation of bone cement depots. Based on this data, clinically significant concentrations of antibiotics may be present for much shorter periods of time than previously thought.
DEPRESSION AND ANXIETY IN A 26 YEAR-OLD G2P2 POST-PARTUM FEMALE: A CASE REPORT

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Introduction: Pregnancy and the post-partum period are commonly considered times in a woman’s life where she is at increased risk for psychiatric disorders with a prevalence of 15-29%. While psychiatric disorders themselves have their own inherent risk and comorbidities for the individual regardless of pregnancy status, adverse outcomes for the offspring are also well documented which include among others maladaptive growth patterns and poor cognitive and behavioral development. Unfortunately, existing knowledge regarding psychiatric issues among pregnant women are based upon findings from clinical samples without well matched non-pregnant controls. In addition, much of the data focuses on symptoms obtained from screening tools rather than conditions based on diagnostic criteria. Recent data from the largest epidemiological study undertaken which controlled for these variables, found that the assumed association for increased risk of the most prevalent mental disorders with pregnancy is unjustified, and essentially the risk is the same for pregnant and non-pregnant women. Overall, only 5-15% of pregnant/post-partum women receive mental health treatment services which is significantly lower than her non-pregnant control.

Case Report: A 26 year-old woman who had been receiving medical care for the last 18 months at the same primary care clinic presents at this particular visit with a chief complaint of “anxiety issues”. This visit is 4 months after her 6 week post-partum visit. During the visit the patient screened positive for depression. Further evaluation showed the patient met criteria for both generalized anxiety disorder and major depressive disorder. When discussing onset, the patient stated her symptoms had been intermittent for months at a time ever since delivering her first child nearly 3 years earlier and at times impeded her functioning both at home and work. Upon reviewing the record it was noted at the post-partum visit, patient was experiencing the blues but no further mention was made into this prior history. At this visit the patient was deemed stable for outpatient therapy, started on an SSRI, referred for cognitive-behavioral therapy and scheduled for follow-up in 2 weeks. Follow-up at the 2-week and 6-week visits showed improving symptoms from depression and anxiety.

Discussion: This case typifies the pattern of management for depression and anxiety in the outpatient setting. This case also typifies the patterns seen on an epidemiological basis where despite frequent provider contacts, psychiatric disorders were both un-recognized and under-treated. Despite a one-time documentation of post-partum blues at the post-partum visit, this patient admitted to experiencing significant distress and dysfunction from the depression and anxiety that occurred at times in her life unrelated to pregnancy status. It raises the questions if she would have been diagnosed and treated earlier if women’s psychiatric disorders were not evaluated on the basis of pregnancy status. In addition, there may be a role for providers of women’s health to view psychiatric disorders of women without the narrow lens of pregnancy.
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**CHOLECYSTITIS... OR SOMETHING MORE SERIOUS?**

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**Introduction:** Signet Cell Type adenocarcinoma; is a diffuse type of gastric carcinoma. It comprises ~3.4% of gastric cancers and is more common in women age 30-40s. Since it lies underneath the mucosa it is often missed on biopsy. There is no difference in survival rates compared to other types of gastric cancer in early stages, but a worse prognosis than other types in late stages.

**Case Report:** A 49 year old obese female presents with belching, abdominal pressure, and bloating for exactly 3 weeks. She reports symptoms worsening at night, after eating fatty foods, and overeating; symptoms improve with vomiting. Pt does report some upper abdominal "contractions" but not pain. Pt has tried OTC simethicone and Maalox with no relief. On physical exam including abdominal exam findings were completely unremarkable with the exception of a BMI of 39.1. She had a past medical history significant for GERD and Hepatitis B, and a 17 pack year smoking history. There is no history of prior episodes other than acid reflux that is improved with Zantac--otherwise negative history. A sonogram of the gallbladder was then completed and was normal. She returned 2 weeks later and had worsening symptoms and was sent for a HIDA scan which was negative. At this visit she was advised to avoid fatty foods, and large meals, keep a diary of particular foods that cause symptoms bringing it to the next appt, and to continue home dose of Zantac. Our patient returns to office a month later with continued worsening of symptoms and RUQ “contractions” have now become painful. She also reported vomiting 1-2x/week after larger meals and increased GERD symptoms at night. Her stools have become lighter in color, and she has had a 20 pound weight loss. Zantac was discontinued and omeprazole was started. At this visit labs were ordered to check a CMP, lipid panel, and Hepatitis panels that were negative with the exception of her previously diagnosed positive Hepatitis B. Her symptoms continued to worsening with daily vomiting after any food. At her next visit a week later she was offered and educated about surgical evaluation or CT of abdomen. She preferred the surgical consult. The day prior to her surgical evaluation she presented to the hospital and was admitted following a syncopal episode secondary to dehydration. She was sent for EGD which was initially unsuccessful because her stomach was filled with food and liquid. Differential diagnosis included gastroparesis vs. gastric outlet obstruction and she was made NPO and NG tube placed. The next day the EGD was repeated and found to have a hugely dilated stomach. They were unable to advance scope beyond pyloric sphincter. A CT was then completed which found a mass at first portion of duodenum measuring 4.5cm x 4cm. Surgery was consulted for biopsy of lesion which showed poorly differentiated Adenocarcinoma of the signet ring cell type. She underwent resection of the tumor and oncology was consulted for chemotherapy and radiation. She received chemo and radiation treatments but unfortunately were not successful in remission and the cancer progressed. She passed away with hospice care approximately 16 months after her initial clinical visit.

**Discussion:** Keeping a broad differential in mind with patients presenting with abdominal pain is significant for primary care physicians. This approach can deter practitioners from developing tunnel vision when the patient presents with changes and the disease progresses. This is key in patients with progressive dysphagia, early satiety, and weight loss, always keeping cancer in your differential diagnosis. Treating H. Pylori infections is always important as it is a significant risk factor for developing gastric carcinoma.
DERMATOMYOSITIS PRESENTING INITIALLY AS PANNICULITIS: A CASE REPORT

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**Introduction:** Dermatomyositis is a connective tissue disorder classically associated with proximal muscle weakness, Gottron’s papules, shawl sign and heliotrope rash. There is a female to male predominance of 2:1, with peak incidence in the age group of 40-50 and a prevalence rate of approximately 1 in 100,000. Panniculitis is a rare cutaneous manifestation of dermatomyositis occurring as tender, erythematous nodules or plaques, most often occurring on the thighs, arms, abdomen and buttocks. There is commonly pain, calcinosis and lipoatrophy associated with this condition. Injury seems to be secondary to antibody and complement-mediated microangiopathy, however precise mechanisms are unknown. Treatment consists of corticosteroid therapy (IV or PO) until resolution of skin manifestations, as they will not resolve spontaneously and can leave drastic disfigurement. Occasionally, other therapies are necessary such as immunomodulators or antimalarials. Panniculitis in dermatomyositis has also been found to be a good prognostic factor, as there are only 3 reported cases of carcinoma associated with this diagnosis. In dermatomyositis without panniculitis, the malignancy risk is estimated to be 6-60%.

**Case Report:** A 46 year old female presented with a several month history of abdominal and thigh lesions. Areas were erythematous, indurated, and tender to the touch. Initially areas started small, but there were times with “flares” that the areas would enlarge and become more erythematous and sensitive, and new areas would arise. Initial labs were noted to be within normal limits; including CBC, CMP, ANA, ESR, and with a mildly elevated CRP. The patient was sent for ultrasound of the area which showed normal tissue. An MRI was nonspecific showing skin thickening and fatty stranding of the subcutaneous soft tissues. She was therefore sent for biopsy of the area by general surgery. Biopsies showed portions of subcutaneous adipose tissue with septal fibrosis and prominent reactive lymphoid hyperplasia. Histologic changes favored lupus panniculitis and the patient was sent to rheumatology. Rheumatologic serologies and the physical exam pointed towards dermatomyositis panniculitis, rather than lupus. She was noted to have an elevated CK (5580; down to normal ranges after therapy was started) and immature white blood cells. Her physical exam was significant for proximal muscle weakness particularly in her lower extremities. The patient began treatment with Prednisone and CellCept for control of her symptoms. She continues to have areas of erythema and induration but with control of symptoms she has had a decreasing number of flares and sensitivities.

**Discussion:** Panniculitis is a rare cutaneous manifestation of dermatomyositis that needs particularly prompt diagnosis secondary to irreversible lipoatrophy with panniculitis flares. There have been only approximately 20 reported cases of dermatomyositis panniculitis; treatment therefore is mostly empiric. Initial therapy includes prednisone with the addition of immunomodulators as necessary. Most cases seem to resolve with corticosteroid therapy.
THREE DAYS AT $14,883.50 – THE COST OF DISENFRANCHISEMENT AND DEPRESSION

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Introduction: In their latest account of income, poverty, and health insurance, the U.S. Census Bureau reported that nearly 50 million Americans, about 16%, are uninsured. Among the nonelderly portion of that group, it is estimated that 11.4 million individuals, approximately one third, suffer from at least one chronic condition. Consistent health insurance coverage leads to increased healthcare access and improved health outcomes for these patients. Its lack may lead to preventable deteriorations in individual health as well as population-level consequences such as reduced labor force participation, lower productivity, and increased use of scarce, expensive emergency services for routine care. Approaches to addressing the needs of the uninsured generally fall into two broad categories: expanding community health centers and “safety net” facilities to provide free or low-cost care or creation of policies extending health insurance to those without it. While awaiting legislative intervention to effect the latter, it is possible for a safety net clinic, even with limited staff and resources, to improve health status and provide continuity of care for uninsured individuals with chronic conditions. Here we report the case of a 42-year-old man with sarcoidosis who presented to the Legacy Foundation Chris-Town YMCA Free Medical Clinic.

Case Report: A 42-year-old uninsured male with a 5 year history of sarcoidosis affecting liver and lungs, s/p placement and subsequent revision of VP shunt for hydrocephalus was referred to a free community health clinic for follow-up. Until receiving his diagnosis of sarcoidosis, he had been living independently and working full-time as a truck driver in Columbus, Ohio. Due to symptoms of his disease the patient was unable to keep his job. He worked briefly as a school bus driver to maintain insurance coverage but again was forced to leave his job because of a flare of his symptoms. Eighteen months prior to presentation at the clinic, he lost his home and moved to Arizona to live with his mother. He took a new job as a security guard. Six months later he found himself unable to meet the rigorous demands of this position and became unemployed and uninsured for a third time. As one of the 100,000 childless adults affected by the $500 million budget cuts to AHCCCS in October of 2011, he became unable to afford routine healthcare and was forced to stop taking his prescription medications. His applications for ALTC, SSI/MAO, and Social Security Disability were denied. Thus, on the numerous occasions when he experienced both major and minor complications of his granulomatous disease he sought care in the emergency department of a local hospital. This episodic treatment for acute flares of his disease proved to be inadequate and contributed to the patient’s feelings of extreme frustration, hopelessness, and disenfranchisement by the healthcare system, ultimately culminating in a $14,883.50 three day hospital stay for depression. When finally seen at the community safety net clinic, physicians were able to identify the patient’s immediate and long-term needs and start continuity of care. In addition to prescribing appropriate affordable medications using the $4-list, they collaborated with local providers for provision of free behavioral health, pulmonology, and neurology specialty consultations.

Discussion: With adequate access to care, sarcoidosis, like many chronic diseases is a treatable condition. This patient, previously healthy and self-sufficient with a career and insurance coverage, lost his home, job, and ability to manage his condition. Insurance-based solutions enacted at the legislative level may not be timely or effective for all patients. Thus, the importance of community safety net facilities cannot be overstated. Maintaining patients like this in the healthcare system, no matter how limited the capacity may be, has the potential to decrease the disease burden felt by the patient, increase his/her quality of life, and reduce the total burden of uncompensated services felt by the healthcare system as a whole.
KEY INGREDIENTS TO CREATING COMMUNITY HEALTH SAFETY NETS

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Purpose: According to the 2010 U.S. Census Bureau, over 50 million Americans, nearly 17% of the population are uninsured. In Maricopa County this number is 24%. With decreasing access to private insurance and increasing numbers of un- and under-insured individuals, there is a growing demand for “safety nets” to care for these low-income, vulnerable populations. The Legacy Foundation Chris-Town YMCA Clinic was designed as a safety net serving a subset of the uninsured population within the Phoenix metropolitan area. Despite health care reform legislation, a significant number of individuals will remain uninsured and reliant on safety nets, making it essential to evaluate the structure and adequacy of these organizations. Through rapid cycle quality improvement key components of operating a community health safety net have been identified in order to optimize the care delivered to this targeted population.

Methods: The Legacy Foundation Chris-Town YMCA Clinic was developed through collaboration with local non-profits and the Phoenix Baptist Family Residency Program. The clinic is nestled in the heart of the I-17 Corridor. Data from the AZ DHS demonstrates a community served by our clinic with higher unemployment, poverty, AHCCCS, mortality, birth and hospitalization rates, as well as a lower education level than the rest of the county and state. In order to optimize the delivery of care an online database was created to log the patient demographics, diagnoses, labs ordered, medications prescribed and a “wish list” for each encounter. This database, as well as pre- and post-clinic huddles, provided same-day feedback essential for the rapid cycle quality improvement philosophy of the clinic. Transparency is achieved with bi-monthly emails to all stakeholders involved identifying needs for change which are implemented by the next clinic.

Results: To date, patients have a show rate > 90 percent. The patients are > 90% Hispanic, of those >90% are from Mexico who have lived in the U.S. for either 1-2 years or 10-20+ years. Over 60% of the patients are females. They are a young (40.6yo), married and relatively healthy population with an average of 2.4 diagnoses per encounter. Cardiovascular (18%), lifestyle (16%), endocrine (12%) and musculoskeletal (10%) diagnoses comprise over half of all visits. Based on BMI, 50% of the population is obese. There is a waiting list of >200 patients at any given time and the clinic is chronically understaffed by physicians.

Conclusions: Non-conventional hours, an accessible location within the community, point of care labs, the utilization of $4 list medications, and low/no cost services all increase the accessibility of the safety net clinics within the community they are designed to serve. Community collaboration also improves the care provided. Multiple local, state and federal agencies have opened their doors to improve the services offered. Esperanca, ADHS, St. Vincent de Paul, Midwestern University, AzAFP and Maricopa Medical Society are just some of the organizations that regularly offer nutrition classes, specialty services, group classes, flu vaccines, preventative services and advertisement at no cost. Clinic coordinators that track each patient, provide quality checks, fill in the gaps in charts and follow up have been invaluable to the flow of the clinic and the rate of improvement. Despite its strengths, the Legacy Foundation Chris-Town YMCA Clinic also has significant weaknesses and areas for improvement. There is a high need for preventative services, imaging, and vaccines. More physician volunteers are necessary to tackle restricted hours of operation and a lengthy waitlist. By applying these principles and with increased awareness within the community among physicians and non-profit organizations the needs of this population can be met, improving the health of the community and decreasing uncompensated care to the health care system.
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IMPROVING COMPREHENSIVE HEALTH CARE IN A RESIDENCY CLINIC: A QUALITY IMPROVEMENT PROJECT

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Purpose: Comprehensive care, as defined by the American Academy of Family Physicians, is the concurrent prevention and management of multiple physical and emotional health problems of a patient over a period of time in relationship to family, life events and environment. Language barriers, time constraints, and multiple other factors can make the provision of comprehensive health care a challenge. Within a residency-based clinic this problem is compounded by the fact that residents may have poor time management issues, lack medical knowledge, and decreased continuity with patients. These many factors correlate with decreased comprehensive health care maintenance (HCM). To address these issues a Plan-Do-Study-Act (PDSA) project was designed to address high priority prevention needs at every visit, leading to an improvement with a patient’s HCM.

Method: The top 4 HCM topics were identified by gender and age groups through literature searches. The next phase of the project was to create a questionnaire relative to these topics for patients to fill out, then reviewed by nursing staff for accuracy/completeness and given to the provider prior to entering the room. Provider and staff education was a priority and included a power point presentation whose purpose was to explain the rational of the project, individual roles, and stages of implementation. Quick desk references were also distributed to residents to understand the USPTSF recommendations being used. A 90 patient random chart review was performed at the six month mark measuring pre and post implementation. Lifestyle interventions (obesity, smoking) and cancer screenings (colon and breast) were made the focus of the review. The goal was to have 80% of the patients be up to date on these HMC services.

Results: Prior to the use of the questionnaire 21% of patients whose charts were reviewed had lifestyle interventions or cancer screening measures addressed. Six months after this project was started data showed an increase to 23% having the same intervention and measures addressed. This showed a 2% improvement in addressing HCM issues, which fell far below the goal of 80%. Chi-squared performed on pre and post populations were 14.8, with a p-value of 0.06, suggesting a high degree of homogeneity between groups. Resident’s were asked if they felt the questionnaire was useful and if they would use something similar in the future. Eighty three percent said they felt it was useful, with 77% saying they would use something similar after residency.

Conclusion: Our data indicates that the quality improvement project failed to produce a statistically significant increase in patient HMC and fell significantly below minimal expectations for a PDSA project. Results don’t correlate with the resident’s response regarding the questionnaire’s usefulness and cast doubt on its use in their future practice. Of note, only one explanatory meeting was held and several residents did not attend due to assignments at other hospitals. This would have caused them to be unfamiliar with the questionnaire and its use. It’s also unclear how many questionnaires were actually filled out and reviewed by the nurse, then given to the resident to use. It can’t be determined if provider lack of interest impacted healthcare team member’s readiness to implement this new process. In future PDSA projects it’s important to have periodic repetition of HMC education to the entire health care team and survey the team’s readiness to engage in a change process. This process did result in the development of a prevention curriculum and institutionalization of an age and gender based questionnaire with the potential to improve a patient’s comprehensive health care maintenance.
BACILLUS CEREUS SEPSIS IN A NEONATE

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PCH/MMC Pediatric Residency Program

Introduction: *Bacillus cereus*, a facultative anaerobic Gram positive rod, is a common cause of toxin-mediated food-borne diarrheal illness in adults. There have been increasing reports of *Bacillus cereus* sepsis in immunocompromised individuals including those with malignancies. Cases of infection in neonates who were hospitalized and required mechanical ventilation have been reported. The exact mode of transmission to neonates is not fully understood. Neonatal infection manifests as fulminant sepsis that is commonly associated with central nervous system involvement leading to intraventricular hemorrhage and or brain abscesses. Early recognition and appropriate antibiotic therapy may improve the outcome.

Case Report: Here we report a case of a male newborn with meningitis due to *B. cereus*. He was born following a twin pregnancy complicated by a premature delivery after 34 4/7 weeks gestation. Birth weight was 2.08 kg and Apgar scores at one and five minutes were 9 and 9 respectively. He was transitioned in the nursery and stayed there with his twin brother for continuous monitoring due to prematurity until day 4 of life where the patient developed apnea and bradycardia during feeding. Increasing accounts of apnea and bradycardia on day 5 of life led to obtaining a CBC and blood culture, the CBC demonstrated a normal white count and a normal differential, and the treatment team at the outside hospital reportedly did not pursue further antibiotic management. Due to worsening clinical status, the patient was transferred to an outside level III NICU for further management. A sepsis workup including CBC, blood culture, urinalysis and urine culture, was significant for leukopenia and 26% bandemia. Ampicillin and gentamicin were started on day 5 of life. On presentation to the outside NICU neurologic examination was significant for delayed Moro reflex and hypotonia. On day 6 of life patient developed hyperbilirubinemia requiring phototherapy, and due to concerns for meningitis, cefotaxime was added to the antibiotic regimen. By report, the twin brother developed similar symptoms and died on day 7 of life. His blood culture was later reported positive for *B. cereus*. On day 8 of life patient developed generalized rhythmic movements in upper and lower extremities that were consistent with seizure activity. Later the patient was transferred to Maricopa Medical Center for further management. On admission, a lumbar puncture was obtained that was significant for xanthochromia and pleocytosis. Blood and CSF cultures were negative but analysis of the CSF by 16S ribosomal RNA gene sequencing revealed *B. cereus* genetic material. An MRI on day 9 of life revealed remote infarcts scattered throughout the brain parenchyma with large areas of focal subacute hemorrhage in the right frontal and bilateral temporal/parietal/occipital areas. The baby received a 28 day course of vancomycin and gentamicin. A follow up MRI showed severe hydrocephalus and extensive areas of necrosis.

Discussion: *Bacillus cereus* is a rare but important cause of fulminant sepsis in the newborn period and is associated with severe morbidity and mortality. *B. cereus* is not only a common source of foodborne illness but a significant cause of blood stream infection in vulnerable patients. In neonates who are being treated for sepsis and not responding to conventional antibiotic therapy, early change to broader spectrum antibiotic regimen is crucial for improved outcome. Whereas most studies suggest *B. cereus* is primarily caused by nosocomial infections, this case suggests possible vertical transmission as the twin had the same infection.
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ACUTE LOWER EXTREMITY WEAKNESS IN A 3-YEAR-OLD MALE: A CASE REPORT

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Introduction: Guillain-Barré syndrome (GBS) is an autoimmune mediated peripheral nerve demyelination affecting both motor and sensory nerve fibers. It is the most common cause of acute flaccid paralysis in children with an incidence of 0.38-0.91/100,000, and the majority of cases are preceded by either respiratory or gastrointestinal illness. GBS has been linked to bacterial (Campylobacter jejuni, Chlamydia, H. Influenzae) and viral (Cytomegalovirus, Enterovirus) infections, immunizations, and certain medications, with Campylobacter infections being the most common preceding infection. Symptoms classically consist of progressive, bilateral, ascending weakness 2-4 weeks following initial illness, and can lead to respiratory failure. Multiple variants of GBS exist including acute inflammatory demyelinating polyneuropathy, acute motor axonal neuropathy, acute motor-sensory axonal neuropathy, Miller Fisher syndrome and polynieuritis cranialis. Treatment includes supportive care, IVIG and plasmaphoresis. We report a case of a child who presented with acute peripheral weakness consistent with GBS without common symptoms associated with a Campylobacter infection, and a brother with similar symptoms, who was later found to be Campylobacter positive and diagnosed with Acute Motor Axonal Neuropathy (AMAN). This form of GBS affects only motor neurons and is the second most common form of GBS in children, but only accounts for 7% of reported cases.

Case Report: A previously healthy 3-year-old male presented to an outside facility emergency department with left upper and bilateral lower extremity weakness. He was transferred to our facility after presenting twice to this outside facility ED with progression of symptoms. Upon arrival, he refused to bear weight on his lower extremities and unable to lift his left arm above his head. Deep tendon reflexes (DTR) were present bilaterally in all extremities and normal. There was no history of recent illness, upper respiratory symptoms, GI symptoms, or tick exposure. There was reported fever 9 days prior with no other apparent symptoms treated with doxycycline, and he was given a dose of ceftriaxone prior to transfer. Of note, the patient did have a recent family history of gastrointestinal illness (mother and younger brother) and the younger brother having leg weakness, but not to the severity of our patient. A neurology consult was ordered, and the following day the patient had a lack of DTR’s in the lower extremities with normal sensation and normal strength. Due to the patient’s younger brother with similar symptoms in the home, toxic etiologies were also addressed with toxicology service consult and no toxic etiology was found. Stool studies were later positive for campylobacter. EMG studies performed by neurology had evidence of acute motor predominant axonal polyradiculopathy, confirming the diagnosis of GBS, AMAN variant in our patient. The patient was treated with IVIG for 5 days, and did not develop respiratory symptoms. He did have residual weakness, difficulty walking and weakness of his upper left extremity requiring in-patient rehabilitation.

Discussion: This case reminds us that not only are there multiple variants of GBS to consider, but also that it may not be preceded by obvious gastrointestinal or a respiratory illness. There are instances, though rare, found in literature on GBS of subclinical Campylobacter infections leading to GBS. A few other case reports of familial GBS are also found in the literature suggesting a genetic predisposition to developing the disease. Therefore, GBS and campylobacter infection must be considered in the differential diagnosis of any acute ascending peripheral neuropathy to expedite treatment due to the risk of respiratory failure, especially in the context of arreflexia, and a good family history obtained.
TRANSFORMING THE COMMUNITY PEDIATRICS CURRICULUM: PRELIMINARY RESULTS SHOW IMPROVEMENT

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Purpose: The Community Pediatrics Curriculum at Phoenix Children’s Hospital/Maricopa Medical Center Pediatric Residency Program was expanded in October 2011 due to resident feedback. Baseline data from July 2009 was used to compare to new curriculum. Evaluation of the new curriculum began in July 2012. We anticipate the completion and comparison of data in July 2013. Our two main goals were to improve the resident satisfaction of the community pediatrics curriculum and increase the overall perceived confidence of residents regarding pediatric advocacy and to improve the satisfaction of the longitudinal community advocacy projects.

Methods: Second year pediatric residents at Phoenix Children’s Hospital were evaluated after participating in a mandatory block month community pediatrics rotation and all pediatric residents participating in our monthly advocacy curriculum and projects. Data from July 2009 was compared to responses from July 2012-January 2013. The same evaluation form was utilized and all responses were anonymous. The changes in the Community Rotation Curriculum includes a more diverse block month community sites, a structured reflection piece, online learning modules, and lectures covering advocacy and medical home. We will continue institution of a monthly advocacy curriculum presented at noon conference for all the pediatric and medicine pediatric residents.

Results: Outcomes are measured from the end of the month rotation evaluation and annual program critique. Baseline data from the annual program critique in July 2009 is used for comparison. Outcomes measures will target resident’s perceptions in 6 major areas:

- Overall satisfaction of the community rotation (Scale of 1-5) 2009 3.93 (n=29) 2012 4.21(n=5)
- Communicating with legislators about your concerns (Scale of 1-4) 2009 2.22 (n=76) 2012 3.20 (n=5)
- Finding community groups who share your interests in child health (Scale of 1-4) 2009 2.51 (n=76) 2012 3.40 (n=5)
- Translating an idea for a community program or intervention into a realistic community project (Scale 1-4) 2009 2.34 (n=76) 2012 3.20 (n=5)
- Finding and interpreting morbidity/mortality data on the internet (Scale 1-4) 2009 2.70 (n=76) 2012 3.4 (n=5)
- Analyzing factors leading to a community health problem (Scale 1-4) 2009 2.46 (n=76) 2012 3.00 (n=5)

Conclusions: Our curriculum was changed in October 2011 but data collection was not instituted until July 2012 leading to a delay in measureable results due to lack of standard evaluation in place. Careful preplanning of our evaluation of the curriculum at the onset would have improved our data collection as well as allowed feedback in smaller numbers as we made the curriculum changes. Currently there is preliminary data that shows the changes to the community rotation curriculum has been seen as favorable by the residents. Satisfaction of the rotation has improved. Residents have found increased perceived ability to communicate with legislators and community programs.
CONCERN FOR ACUTE MYELOID LEUKEMIA PRESENTING AS AN OVARIAN MASS

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Introduction: Granulocyte sarcomas are rare extramedullary tumors of malignant myeloid precursor cells. They can present de novo, occur concurrently with acute myeloid leukemia, or present as the only manifestation of AML relapse. Histology demonstrates an infiltrative population of mononuclear cells accompanied by granulocytes at three levels of maturation – blastic, immature, and differentiated cells. Granulocyte sarcomas can affect any organ and most commonly involve skin, lymph nodes, and bones; ovarian involvement is rare.

Case report: A 17-year-old previously healthy female presented to a local hospital with a one month history of abdominal distention and worsening abdominal pain. Her pain was localized to the left lower quadrant and constant in nature, but worse with urination and with movement. On exam, her abdomen was soft, mildly distended, tender to palpation in the lower quadrants, and a firm mass was palpated in the lower abdomen, described as “17 weeks” in size. CT abdomen and pelvis demonstrated a large pelvic mass (17.1 cm x 13.7 cm x 16.5 cm) with multiple enlarged periaortic, precardiac, and adjacent lymph nodes, as well as bilateral hydronephrosis secondary to obstruction from the pelvic mass. She underwent exploratory laparatomy, which revealed a large right ovarian mass and hemorrhagic ascites; right salpingo-oophorectomy and para-aortic lymphadenectomy were performed. The operative and perioperative periods were complicated by significant blood loss and coagulopathy. Pathology findings were concerning for granulocytic/myeloid sarcoma. She was subsequently transferred to Phoenix Children’s Hospital for further work-up for acute myeloid leukemia and for further management. Bone marrow biopsy and cerebrospinal fluid studies did not demonstrate any evidence of metastatic disease. Treatment was initiated according to the Children’s Oncology Group (COG) protocol AAML0531. The patient has been in remission for more than 12 months.

Discussion: The incidence of granulocytic sarcomas is unknown; retrospective incidence of 3-4% has been previously suggested (Muss and Maloney; Oliva et al.). Although any organ can be involved, ovarian granulocytic sarcomas are rare. Current literature on granulocytic sarcomas involving the ovary consist only of case reports. The majority of granulocyte sarcomas can be detected by a standard panel of monoclonal antibodies including myeloperoxidase, lysosomal-associated antigen, CD43, and CD20, to identify myeloid cells and to exclude lymphoma.

Primary granulocytic sarcoma is treated with AML therapy with equal outcomes, although surgery and/or radiation therapy may be required for local disease control and to ameliorate local mass effects. In patients with acute myeloid leukemia at the time of initial diagnosis, studies have shown that the rate of survival may be less than 50%. If left untreated, acute myeloid leukemia develops in nearly all patients with granulocytic sarcoma (Cunningham). The risk of recurrence is about 50%, and may manifest in other organ systems. Because the condition is more common in children than in adults, the risk of relapse is increased. It has been estimated that the number of pediatric cases in the United States is twice the number of reported cases in adults (Cunningham).
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EXCHANGE TRANSFUSION FOR RH INCOMPATABILITY IN AN RH NEGATIVE INFANT

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Introduction: Rhesus (Rh) negative women who are exposed to an Rh positive fetus are at risk for developing anti-Rh antibodies; these can later go on to hemolyze the red blood cells of Rh positive fetuses in future pregnancies. This is the most common scenario of Rh alloimmunization in pregnancy. The frequency of alloimmunization and subsequent fetal/neonatal complications has been greatly reduced through the implementation of programs for antenatal and postnatal Rh(D) immune globulin prophylaxis. A less common scenario involves D antigen variants, variously called partial D, weak D, Rh mod, D(u), and D(el), in which the D gene may be present but not translated or expressed, weakly expressed, or partially expressed. These patients may or may not type as D+, depending on the serologic reagent used and may type as Rh negative. Patients with these variants are at risk for developing anti-D antibody if exposed to Rh+ blood, and conversely, their RBCs may induce anti-D antibody if administered to Rh(D) negative recipients.

Case Report: A 2950 gram female was born at 37 2/7 weeks GA to a 19-year-old G2P1 mom via C-section for fetal intolerance of labor. Mother was B negative and did not receive Rhogam during her first pregnancy. She received Rhogam during this pregnancy and also required percutaneous umbilical blood sampling (PUBS) and intrauterine transfusion two weeks prior to delivery for abnormal MCA dopplers and increased maternal antibody titer. Maternal titers were positive for anti-C and anti-D antibodies. Baby was initially hypotonic and cyanotic with Apgars of 7 and 9, requiring resuscitation with blow-by oxygen for two minutes. At 6 hours of life, she was found to have a total bilirubin level of 14.4, even though her blood type was initially also found to be B negative. She required a double volume exchange transfusion of 480 mL on day of life 1 via UAC and UVC line placements. She required intensive phototherapy for 6 days and was followed with serial bilirubin levels with anticipated decline after DV exchange transfusion. She also received phenobarbital on DOL 1 and IVIG for her first three days of life, in an effort to minimize hemolysis as much as possible. Her peak bilirubin during her NICU stay was 14.4 at 6 hours of life; this finally declined to 6.4 on day of discharge. Blood type and screen was performed twice and baby was found to be B negative, 2+ direct coombs positive anti-C and anti-D; however, she did not have antigen G, C, or D. She was later found to be D(u) antigen positive. Her hemoglobin at discharge was 11.3 with a hematocrit of 32.2 and stable.

Discussion: The need for PUBS and transfusion in fetal life and double volume exchange transfusion on day of life 1 despite infant and mother both being B negative blood types drew attention to this case. It is rare, but severe hemolytic anemia can develop in fetuses/neonates with D antigen variants. IVIG and transfusions were adequate to treat this patient’s hyperbilirubinemia, but she required weekly hematocrit monitoring and was expected to have months of hemolysis. She will always need Rh negative blood, but if she is donating blood she should be considered Rh positive. There is a need to be aware of these less common antigens that can be potential causes of hemolytic anemia and transfusion reactions, especially as they are not always detected on initial type and screening.
CONGENITAL DIAPHRAGMATIC HERNIA IN A 5-YEAR-OLD MALE

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Introduction: Congenital diaphragmatic hernia (CDH) is a developmental defect of the diaphragm that allows for abdominal contents to herniate into the chest cavity. CDH occurs in approximately 1 in 2,200 live births. Up to 90% of defects are posterolateral, also known as Bochdalek defects. Eighty-five percent of defects are left-sided. Most defects are identified perinatally with respiratory distress and complications from pulmonary hypoplasia. Small defects can go unidentified at birth if no abdominal contents are herniated through the diaphragm. Rarely, herniation and incarceration can occur, leading to emesis and abdominal pain.

Case Report: A previously healthy 5-year-old male presented to the Emergency Department with 3 days of emesis, fatigue, mild intermittent cough and inability to tolerate oral intake. Review of systems was remarkable for approximately 10 episodes of non-bloody, non-bilious emesis daily, intermittent abdominal pain, and no passage of stool for 2 days. The history was negative for rhinorrhea, congestion, fever, chest pain, or difficulty breathing. Exam revealed an afebrile patient with tacky mucous membranes, tachycardia, intact capillary refill, diminished breath sounds over left base, with respirations and saturations within normal limits. Abdominal exam remarkable for no tenderness or distention and hypoactive bowel sounds. Basic metabolic panel, abdominal radiograph, IV Zofran, and two normal saline boluses were ordered. Radiologist read abdominal film as: paucity of abdominal gas consistent with history of emesis and left basilar air space disease with left pleural effusion. A chest x-ray was then performed which was read as left lower lobe pneumonia with a left pleural effusion. BMP was remarkable for metabolic acidosis consistent with dehydration. Patient was started on Ceftriaxone for left lower lobe pneumonia and the patient was admitted with the following diagnosis: pneumonia, emesis, and dehydration. Admission team noted dried blood to right nares, continued normal respiratory rate, and saturations with decreased air entry and crackles over left lung base. Morning following admission, primary team discussed clinical course inconsistent with pneumonia and therefore ordered a chest ultrasound to further examine the pleural effusion. Complete blood count ordered which demonstrated no leukocytosis though did have a left shift and repeat complete metabolic panel demonstrated resolution of the metabolic acidosis. Chest ultrasound revealed left diaphragmatic hernia bowel loops as well as spleen present in the left side of the chest and distention of the stomach. Salem sump immediately placed to low intermittent wall suction and urgent surgical consultation obtained. Patient was taken to the operating room for thorascopic repair that day with intra-operative identification of multiple loops of small bowel, one loop of colon, and the spleen within the left chest. These structures were reduced and defect repaired with pledget. Post-operative chest X-ray demonstrated residual left pneumothorax and patient placed on oxygen via non-rebreather for nitrogen washout. Post-operative course was otherwise uncomplicated and patient was discharged home on post-operative day 4.

Discussion: The unusual presentation of CDH later in life draws attention to this case. However, focus should also be paid to the importance of history, physical examination and development of diagnostic skill in this case. The development of diagnostic skills is a complicated process. While the novice utilizes problem lists and differential diagnoses, the expert tends to use heuristics (mental shortcuts) and pattern recognition to come to a proper diagnosis. In this case the experienced attending was able to recognize that the radiology report of pneumonia did not fit with the constellation of findings (the “pattern”) usually seen with this diagnosis. When a piece of data doesn’t fit, the experienced physician will look for alternative diagnoses.
EBV-ASSOCIATED IDIOPATHIC THROMBOCYTOPENIC PURPURA

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Introduction: Idiopathic thrombocytopenic purpura (ITP) is an autoimmune disorder in which antibodies bind to platelets, usually after a viral infection, causing splenic sequestration of the platelets and acute thrombocytopenia. ITP often presents in patients as isolated petechiae, purpura, bleeding from gums and oral mucosa, and rarely, splenomegaly, lymphadenopathy, bone pain, and pallor.\textsuperscript{1} The typical age for ITP is 1-4 years of age. We report a case of EBV-associated ITP in a 16 year old male, an atypical age for ITP, with no other sequelae of EBV aside from severe thrombocytopenia, and relative resistance to initial standard treatment.

Case Report: A 16-year-old male was admitted for two days of abrupt onset of diffuse petechiae and bleeding gums and oral mucosa. He had one episode of epistaxis a month earlier, but no other bleeding was noted. The patient did not have any personal or family history of coagulopathies or rheumatologic disorders and was not taking any medications. He previously had vague abdominal pain prompting an ultrasound that revealed borderline hepatomegaly and hepatosteatosis one month prior. Labs including LFTs, hepatitis viral panel, and lipid panel were unremarkable. The patient was advised to alter his diet and the abdominal pain resolved within a month. Social history was significant for high-risk sexual behavior, but the patient denied any known previous sexually transmitted diseases. At time of admission his initial platelet count was 3,000/mcL. The remainder of CBC was normal with one atypical lymphocyte noted on peripheral smear. Two doses of IVIG were given over 48 hours for presumed ITP, with little improvement. On the third day, prednisone was started with a noticeable improvement in platelets to 26,000/mcL. Peripheral smear and flow cytometry were not suggestive of a blood malignancy. Preliminary viral studies, including HIV, were negative but eventually demonstrated positive EBV titers, which were thought to be the likely etiology for the ITP. On further questioning, the patient had no history or subacute symptoms of tonsillitis, rash, splenomegaly, or other stigmata consistent with EBV. He was discharged with stable, improving thrombocytopenia, but within two months required two subsequent admissions for low platelet counts, both of which responded well to Anti-D therapy.

Discussion: In our case, we have an adolescent patient who developed an abrupt decline in platelets and whose EBV-associated thrombocytopenia wavered with IVIG and prednisone but improved quickly with Anti-D therapy. In one retrospective study, EBV-associated ITP was less responsive to therapy compared to cases without EBV infection.\textsuperscript{2} Anti-D therapy, though with the rare risk of significant hemolysis and renal failure, may be indicated sooner than IVIG for hospitalized patients with severe ITP, EBV-associated ITP, or atypical age. This case highlighted the paucity of evidence-based literature and professional consensus directing specific treatment practices for ITP, including which particular therapy and time course is most effective in improving platelet counts. A metaanalysis has shown that, compared to IVIG, treatment with corticosteroids was 26% less likely to achieve platelet count > 20,000/mcL in a 48 hour period, but the study was not able to determine if there was a significant difference in clinically relevant outcomes. Three randomized trials between IVIG and Anti-D have shown no significant difference in time to achieve platelets > 20,000/mcL.\textsuperscript{3} While these past studies have offered limited data to help guide therapy, it would be helpful to continue these studies and for future studies to explore treatment efficacy depending on age group and specific viruses associated with ITP, and to eventually develop a more conclusive approach to diagnosis and treatment.
PLASMODIUM FALCIPARUM INFECTION IN A 5-YEAR-OLD IMMIGRANT MALE

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Introduction: Malaria, a mosquito-borne febrile illness caused by the protozoan Plasmodium, occurs in over 100 countries spanning Africa, Asia, Latin America and the Middle East. Nearly 50% of the world’s population lives in malaria endemic or epidemic areas; 350-500 million cases occur annually, leading to nearly one million deaths, with a disproportionate majority occurring in African children. Although four species of malaria frequently infect humans, the combined morbidity and mortality of Plasmodium vivax, P. malariae and P. ovale are eclipsed by that of P. falciparum. Classically, malaria can present with paroxysms of high fever, chills, night sweats and headache, but clinical manifestations range from febrile, non-specific illness to medically emergent syndromes. Approximately 1400 cases of malaria are detected in the US each year, nearly all of which are imported, with an estimated 3-5 deaths primarily due to delayed diagnosis and treatment. Prior to the 1950s, malaria was endemic in large parts of the US, but owing to improved housing and socioeconomic conditions, environmental management, vector-control, and case management efforts in the 1940s, malaria transmission was interrupted. Malaria is a reportable disease and case surveillance has been maintained in the US to detect locally-acquired cases that could indicate the re-introduction of transmission, and to monitor patterns of resistance to antimalarial drugs.

Case Report: A 5-year-old previously healthy immigrant male, recently arrived from a Tanzanian refugee camp, presented to the pediatric emergency department via emergency medical services (EMS) within one hour of an acute onset of unresponsiveness with high fever. Per maternal report, the family had arrived in the US two weeks prior to presentation. One week prior to admission, the patient developed cough and coryza in the setting of a 9-year-old sister with similar symptoms and a 20-year-old sister hospitalized with sickle cell vaso-occlusive crisis. Two days prior to presentation he began to complain of poorly localized abdominal pain and headache, with diminished PO intake and subsequent development of fever on the night prior to admission. On the day of arrival, the patient spiked a fever to 44°C, collapsed to the floor unresponsive and incontinent of urine, without note of involuntary or rhythmic movements. EMS was called and upon arrival to the emergency department, the patient was noted to be febrile to 40°C and dehydrated but responsive. Initial labs were notable for a normal white blood count with left shift, normocytic anemia, thrombocytopenia and elevated inflammatory markers. An abdominal ultrasound demonstrated a mildly prominent spleen, but was otherwise unremarkable. Further workup revealed a blood smear with 11.2% parasitemia, notable for many forms resembling falciparum species. Ova and parasite, human immunodeficiency virus, and Mycobacterium tuberculosis screens were all negative. Hemoglobin electrophoresis was not performed to assess for sickle cell status, although normal red cell morphology was noted on several CBCs during admission. He was initiated on a three day course of atovaquone-proguanil with subsequent resolution of fever and parasitemia prior to discharge.

Discussion: Malaria vector mosquitoes, namely Anopheles, are present in all states and territories in the US, with the exception of Hawaii. People in the US at risk for malaria include travelers to, and immigrants arriving from, endemic countries. Exposed individuals can develop signs of infection as early as seven days and up to a year following exposure. The patient in this case highlights a non-specific presentation of an illness uncommonly seen in the US but with significant morbidity and mortality if diagnosis or treatment is delayed. Pediatricians today carry not only the burden of identifying common, serious etiologies of illness, but must also have a high index of suspicion for exotic disease in any patients with international exposures.
ACUTE MYELOID LEUKEMIA IN A 17-MONTH-OLD BOY PRESENTING WITH PROPTOSIS: A CASE REPORT

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Introduction: Acute leukemia is the most common childhood malignancy, and Acute Myeloid Leukemia (AML) represents 15-20% of these with close to 500 new cases per year. AML consists of a group of hematopoietic neoplasms involving precursor cells committed to the myeloid line of cellular development, including granulocytic, monocytic, erythroid, or megakaryocytic elements. AML is characterized by clonal proliferation of these myeloid precursors with a reduced capacity to differentiate into more mature cellular elements. This results in an accumulation of leukemic blasts in the bone marrow, peripheral blood, and occasionally other tissues and a reduction in the production of normal red blood cells, platelets, and mature granulocytes. The increased production of malignant cells, along with a reduction in mature myeloid elements, results in anemia, thrombocytopenia, and neutropenia. The most common presenting symptoms include fever, fatigue, bleeding, bone pain, pallor, anorexia, and weight loss. Upon diagnosis, the primary goal of treatment is to begin induction chemotherapy as soon as possible, making timely recognition of symptoms extremely important. We report a case in which the initial presenting symptoms of AML were proptosis and peri-orbital edema.

Case Report: A 17-month-old male arrived at a medical center with complaints of peri-orbital swelling for the past 2 months. He was initially seen by his PCP, had a urine analysis done which was negative for protein – making nephrotic syndrome unlikely – and his symptoms were attributed to allergies. He was subsequently referred to an allergist and was treated with steroids. However, the swelling progressed and his mother began to notice an enlarged, bluish appearance to his scrotum, difficulty opening his eyes secondary to swelling, intermittent fevers, decreased appetite, and a 4lb weight loss. One week prior to admission, the patient began having noisy breathing and nasal congestion in addition to his other symptoms. Initial exam at our facility showed a pale, alert patient. His eyes were protruding with purple discoloration and significant peri-orbital edema was present. There was nasal congestion, noisy breathing and tachypnea - although his lungs were clear. There was no palpable lymphadenopathy. The GU exam demonstrated an enlarged scrotum, Left>Right, with palpable testis and swelling at the base of the penis. The CBC on admission was normal. Clinically, his ocular symptoms were consistent with proptosis, and the patient had normal thyroid function tests - this ruled out Grave's disease as the etiology of his symptoms. Concern for a neoplastic process prompted an MRI of the brain and orbits, which demonstrated an infiltrative orbital maxillofacial process with accompanying cervical lymphadenopathy. LDH was elevated at 1053. PET scan showed disseminated disease involving the bones, peri-orbital soft tissue, cervical soft tissue, and testicles. Transnasal biopsy of the involved sinuses and bone marrow biopsy was done and a diagnosis of Acute Myeloid Leukemia with monocytic differentiation was made. Induction chemotherapy was promptly initiated with Cytarabine, Etoposide, and Daunorubicin. The patient’s initial lumbar puncture showed blasts in the CSF, and he received weekly intrathecal chemotherapy. Following induction chemotherapy, he continued to have residual disease on MRI and PET scan, and the CSF was again positive for blasts. He therefore began daily radiation therapy and further chemotherapy. The patient began to have worsening systemic symptoms including hepatosplenomegaly, rash, skin nodules, tachypnea, and tachycardia. After discussion with the palliative care team, the patient’s mother decided to discontinue chemotherapy and proceed with Hospice and comfort care measures.

Discussion: The unusual presentation of proptosis and peri-orbital edema in a child treated with steroids and later diagnosed with disseminated Acute Myeloid Leukemia draws attention to this case. Despite ongoing efforts to improve treatment, childhood AML remains a challenging disease with 5-year survival rates approaching 50%. Research has shown that treatment with steroids prior to leukemia diagnosis can induce a delay in management, favor initial complications, increase diffuse locations, and lead to steroid resistance. Therefore, the prescribing of steroids needs to be carefully considered and a CBC should be performed prior to making this decision.
IRON DEFICIENCY ANEMIA AND ANASARCA: A CASE REPORT

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Introduction: Iron deficiency anemia (IDA) develops when the body no longer has enough iron to adequately complete hemoglobin synthesis, which the human body uses primarily for oxygen transport. IDA is one of the most common nutritional deficiencies in the modern world, often only having a very subtle presentation; however, rarely IDA can have profound health effects, such as anasarca, leading to increased morbidity and health care costs.

Case Report: A 2-year-old female with a history of prematurity arrived to an urgent care with the complaint of watery diarrhea for 3 days. The patient was noted to be pale and edematous, most prominently in the peri-orbital and pre-tibial regions. The edema had occurred gradually and the parents hadn’t noticed it. Upon questioning, the patient had been paler in the last 3 weeks and noticeably more lethargic in the last week, sleeping 15-18 hours a day. In the last week the patient had begun refusing solids and was primarily drinking milk. At the urgent care the patient’s hemoglobin was 5.7. The patient was transferred to a tertiary care center for further care where she was found to have an albumin of 1.6, reticulocyte of 2.2, and iron studies consistent with iron deficiency anemia, with a ferritin of 3. Screening of urine, stool guiac, viral panels (EBV and Parvovirus), serum LDH, and Uric Acid revealed no abnormality. Furthermore, she tested negative for thalassemia by electrophoresis, which was sought because of her mentzer index score. With the testing implying IDA and the patient being hemodynamically stable, the patient was discharged on oral iron the following day, with close follow up. By day 3 of therapy, the patient had a marked improvement in energy levels and clinical edema, with labs demonstrating a hyper-erythropoietic response, having a reticulocyte of 8.0 and hemoglobin of 7.6. One month post-presentation the patient’s hemoglobin had returned to normal and the edema had fully resolved. In follow up, the patient’s allergist tested for milk protein allergy and celiac disease which were both negative and the child almost a year out from admission remains without sequella.

Discussion: This case highlights a common preventable illness with a rare presentation, which can lead to an excessive workup and medical expenditures. Furthermore, it speaks to the importance of AAP recommended regular screening for iron deficiency anemia at 1 year and at risk screening at 2 years of age.
COUGH AND CHEST MASS IN A 13-YEAR-OLD MALE: A CASE REPORT

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Introduction: Castleman’s disease, or angiofollicular lymphoid hyperplasia, is a rare disease characterized by massive growth of lymphoid tissues. It was first described by Dr. Benjamin Castleman in 1954. The disease can occur anywhere along the lymphatic system, but the most common location is the mediastinum. Castleman’s disease can be classified into two clinical subtypes: localized and multifocal. The localized form is characterized by a single lymph node chain or area, and it is curable by surgical excision. The multi-focal form has a much less favorable prognosis. Treatment is systemic, which may include partial surgical resection, steroids, chemotherapy and radiotherapy. A subset of Castleman’s Disease is associated with human herpes virus (HHV-8), human immunodeficiency virus (HIV), and malignancies including Kaposi’s sarcoma, non-Hodgkin lymphoma, Hodgkin lymphoma and POEMS (polyneuropathy, organomegaly, endocrinopathy, monoclonal protein, skin) syndrome.

Case Report: A 13-year-old male with no significant past medical history presented to his primary care physician with a chief complaint of cough for two weeks. His cough was described as dry, intermittent, and progressively worsening. He also complained of shortness of breath. He denied fever, nasal congestion, weight loss, night sweats, and chest pain. A chest X-ray was obtained and revealed a large, rounded, right-sided hilar mass. A radiographic differential included asymmetric lymphadenopathy, tuberculosis, fungal infection, lymphoma, metastatic disease, vascular dilation, or abnormality of the pulmonary artery. The patient was referred to the emergency department for further evaluation and admission. A chest CT with contrast was performed, confirming a large, smooth, single, right hilar mass measuring 3.6 x 2.7 x 2.9 cm. Due to the broad differential, laboratory workup included CMP, magnesium, phosphorus, CBC, LDH, uric acid, C. immitus titers, PPD placement, sputum culture for acid fast bacilli, alpha fetoprotein and beta-hcg. Infectious disease, hematology/oncology, and surgery specialists were consulted. The laboratory results were unremarkable, and the patient underwent a thorascopic biopsy. A surgical pathology of the right hilar mass biopsy raised the possibility of lymphoproliferative process such as Castleman’s Disease, but limited material from the biopsy did not reveal a definitive diagnosis. The lymphoid tissue contained rare, small lymphoid follicles with germinal centers. For confirmation, the patient underwent right thoracotomy with mediastinal exploration and excision of the right hilar chest mass. A complete gross total resection of the mass was performed. Intraoperatively, tissue was evaluated by pathology and confirmed a diagnosis of Castleman’s Disease, hyaline vascular type. His post-operative course was uneventful, and he was discharged with close follow-up with hematology/oncology. Three weeks post-operatively, patient was feeling well, without cough, chest pain, or other symptoms.

Discussion: Cough is a common chief complaint in pediatrics, both in the primary care setting and in urgent care centers and emergency departments. This adolescent patient presented with subacute cough. He had no history of asthma, associated symptoms consistent with acute infection, or other common explanation for his cough. He also complained of progressive dyspnea. These concerning findings led to further evaluation, and eventually his diagnosis.
RHABDOMYOLYSIS IN TEENAGE SISTERS FOLLOWING AN INTENSIVE SPINNING CLASS

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Introduction: Rhabdomyolysis is a medical condition characterized by muscle breakdown which can result in acute kidney injury when circulating proteins, particularly myoglobin, are broken down to heme constituents and deposited in the kidneys. Rhabdomyolysis can be precipitated by a variety of mechanisms including increased muscle activity (voluntary or involuntary), traumatic muscle injury, ingestion of drugs or alcohol, hereditary metabolic myopathies, and electrolyte imbalances including hypokalemia, hyperphosphatemia and hyperosmolality. Besides acute kidney injury, rhabdomyolysis can also lead to fluid and electrolyte abnormalities, metabolic acidosis, cardiac dysrhythmias secondary to the severe hyperkalemia, and compartment syndrome. The typical presentation consists of muscle pain, weakness, dark urine, and evidence of elevated serum muscle enzymes.

Case Report: Two teenaged sisters, aged 16 and 17 were brought to the Phoenix Children’s Hospital emergency department in the middle of summer with severe thigh and leg pain and dark urine. The sisters were previously healthy and had been involved in moderate physical activity in the past with no complications. They reported attending a one-hour intensive spin class at a local gym the day prior to presentation. Both sisters reported muscular pain during the class which intensified after completion of the work out. They both completed the full sixty minute class despite the pain and reported minimal water intake during the work out. They had been fairly sedentary for several months prior to the spin class but had just recently joined a gym to get back in shape. In the emergency department they were noted to have very elevated creatine kinase (CK) levels and were admitted for aggressive rehydration. During admission, their CK levels peaked in excess of 100,000. Over the course of 5 days, the girls’ CK levels came down and they were discharged home. Subsequent evaluation in the neurology department for hereditary metabolic myopathies was unremarkable. There was no history of muscle trauma or ingestion and drug screens were negative during hospitalization. The development of rhabdomyolysis in these girls was thought to be due to the combination of increased voluntary muscle activity during the spin class and dehydration.

Discussion: There have been a few prior reports in the literature of rhabdomyolysis occurring in previously sedentary and even healthy active adults participating in spin classes but no reports in children or teenagers. As spin classes are becoming more popular, especially with teens and young adults, it is important to speak with these populations during office visits, as well as instructors of the classes, regarding the potential of injury due to intensive exercise and the importance of adequate hydration. This is of particular significance in Phoenix where the extreme heat can lead to severe dehydration and increase the risk of acute kidney injury related to rhabdomyolysis.
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LANGERHANS CELL HISTIOCYTOSIS: A CASE REPORT

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Introduction: Langerhans cell histiocytosis (LCH) is a rare disease characterized by Langerhans cell accumulation within a single or multiple organs. It may affect the skin, lymph nodes, bone marrow, liver, spleen, central nervous system, thymus, or cause lytic lesions of the bones. Fifty to eighty percent of those affected exhibit cutaneous manifestations that are known to mimic more common skin diseases delaying diagnosis. Thus, skin biopsy proves to be very useful in its diagnosis. Definitive diagnosis is made with positive staining for S-100 and CD1a markers. Gold standard is the identification of Birbeck granules on electron microscopy. We present a case in which skin biopsy proved the key to the diagnosis LCH.

Case Report: A 4-month-old, term female presented with non-pruritic erythematous macular rash, which had developed within one week of birth. The patient had been treated for months by PCP with zinc oxide cream for a “diaper rash,” but had no improvement. The rash progressed, spreading from her labia majora and inguinal folds to her abdomen and back. It eventually involved her occipital scalp and discrete macules were noted to be slightly raised and scaly on palpation. Mother noted the patient cried out or arched her back when the right parietal region of her scalp was touched or rested upon. Two weeks prior to admission to the hospital she began exhibiting significant decreases in appetite, decreased urine output, alternation between constipation and diarrhea, and intermittent low-grade fevers. Patient was seen in dermatology clinic where biopsies were taken. Biopsies were positive for CD1a and S-100 markers consistent with LCH. Patient was admitted for further evaluation. CT head showed extensive erosion of the right mastoid, with thickening extending out to the subcutaneous periauricular tissues, and widening of the right subdural sinus. MRI brain indicated the lesion was eroding into right otic capsule and lateral petrous bone. CT chest showed multiple 1-3mm peripheral nodular densities within the lungs, but no outright parenchymal cysts (typical of langerhans cell involvement) were identified. Given history of feeding and stooling changes, endoscopy was performed with no abnormalities found. No further involvement indicated by additional imaging. Patient had relatively appropriate feeding and stooling observed while admitted. Broviac was placed and chemotherapy was initiated with vinblastine and prednisolone. Diflucan prophylaxis was started prior to discharge with plan to undergo further treatment by outpatient oncology.

Discussion: Fifty one to 71% of children with LCH under the age of 4 present with multisystem involvement. Lytic lesions of bone are the most common finding. Prognosis is influenced by the age of onset, degree at which the various systems are affected, and initial response to treatment. Therapy remains controversial. However, treatment protocols have been developed and include the curettage of bone lesions, administration of chemotherapy, and topical/systemic steroids. Early presentation along with progression, persistence, and unique characteristics of this rash prompted further investigation and accurate diagnosis. Pediatricians must be mindful when seemingly common skin conditions such as seborrheic dermatitis or diaper dermatitis are persistent and continually fail treatment. LCH should be considered in the differential and a referral to dermatology for skin biopsy may be warranted.
MICROCEPHALY, DEVELOPMENTAL REGRESSION AND SEIZURES SECONDARY TO SEVERE MTHFR DEFICIENCY RESULTING IN CNS FOLATE DEFICIENCY

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Introduction: Methylenetetrahydrofolate reductase deficiency is an autosomal recessive disorder that results in the deficiency of 5-methylfolate. This enzyme is essential for the methylation of homocysteine to form methionine. Methionine is an important biochemical substrate involved in many reactions including protein synthesis and the formation of another important substrate in the biochemical pathway known as S-adenosylmethionine.

S-adenosylmethionine is vital in processes such as myelination of the nerves, synthesis of phospholipids, and catecholamines for the nervous system. The failure to regenerate methionine leads to harmful toxic effects from the accumulation of homocysteine which can promote endothelial dysfunction resulting in vascular disease, thrombus formation, and strokes. Clinical signs and symptoms of the disorder include developmental delay, seizures, and microcephaly. We report a case in which onset of symptoms began in the initial months of life in an otherwise healthy male infant who later developed seizures and milestone regression.

Case Report: A 3-month-old caucasian male arrived at a medical facility after having 19 intractable seizures consisting of rhythmic twitching of the extremities, dilated pupils, and an unresponsive stare. After several doses of clonazepam, seizures temporarily abated with a non-focal and unremarkable physical examination in the Emergency Department. EEG demonstrated partial onset seizures. Patient was admitted for further evaluation to the pediatric floor. On the floor, seizures returned, this time associated with apnea and desaturations in the 50-60s requiring bag mask ventilation 2-3 times. Due to his respiratory instability, patient was transferred to the PICU where he was sedated and intubated for protection of his airway. The patient was started on additional anti-epileptic medications including: keppra, phenobarbital, midazolam and fosphenytoin but continued to still seize. A MRI/MRA was performed and showed findings compatible with central white matter volume loss, mild cerebellar volume loss, small appearing brainstem, and probable lack of brain growth. The MRA Brain did not reveal evidence of flow limiting stenosis nor an aneurysm and showed normal vascular distribution. A lumbar puncture for neurotransmitters revealed absence of CNS folate. By this time, the patient had lost his ability to smile, grasp at objects and hold his head up and had a documented microcephaly with OFC at 5%. At this point, with concern for metabolic etiology, genetics was consulted and their recommendation was to check urine organic acids, plasma amino acids, and a total plasma homocysteine level. Subsequent lab results showed a very elevated serum homocysteine level of 118 micromol/Liter with decreased methionine level of 8 micromol/L. Furthermore, DNA testing (gene seq) showed a severely deleterious mutation in the MTHFR gene resulting in failure to generate 5-methylfolate.

Discussion: Seizures unresponsive to AED medications with brain imaging changes and regression in development milestones draws attention to this case. Whereas most MTHFR mutations are mild, severe mutations can result in severe neurological disorders. The patient was treated with high levels of 5-methylfolate and is experiencing some return of previously lost milestones including social smile and head control. Seizures remain a difficult problem.
OXYGEN SATURATION AND THE PERCEPTION OF INFANT COLOR AS RECORDED IN THE APGAR SCORE

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Purpose: To compare pulse oximetry with clinical perception of color as recorded in the Apgar score, as well as the amount of desaturated hemoglobin that is required in term, newborn infants to produce central cyanosis. Infant color is one of the five categories of Apgar scoring, and the infant is classified as cyanotic (blue), centrally pink (centrally pink, peripherally blue), or completely pink. A generally accepted value of 5 g/dL of desaturated hemoglobin has been postulated to correspond with central (especially oral) cyanosis in adults.

Methods: 29 term infants (37+ weeks) born by scheduled cesarean section were included in the study. The majority of the sample population was Hispanic, all had prenatal care, and average maternal age was 30 years. Average initial temperature of the baby was 36.9°C, average length was 50 cm, average birth weight was 3630 g. All had their pre- and post-ductal SpO2 measured by pulse oximetry. The color perception of 116 medical providers (Students, Nurse Practitioners, Residents, Respiratory Therapists, Nurses) at the infant warmer were recorded at minute intervals during the first minutes of life. Lighting and temperature of the room were normalized. Observers committed to one of the three color groups recorded in the Apgar score (blue, centrally pink-especially lips, all pink). A pulse oximetry probe was placed on both the R hand and R foot and readings were recorded and hidden from view. Blood gases (both arterial and venous) were drawn by the nurse from the cord blood of the infant at the time of birth.

Results: At 1 minute the majority of men thought baby was blue and slight majority of women thought the baby was centrally pink. At 5 minutes more women than men thought the baby was centrally pink. At 10 minutes most women thought the baby was still centrally pink, whereas most men thought the baby was pink. At 1 minute the majority of observers < age 40 thought the baby was centrally pink, whereas age 40+ thought the baby was still blue. At 5 min most agreed that the baby was centrally pink, and at 10 min all age groups were evenly split between centrally pink and completely pink. At 1 minute the vast majority of students and the majority of RTs agreed that the baby was centrally pink, nurses were evenly split between blue and centrally pink, and NPs and physicians favored blue. At 5 minutes, the vast majority of all groups agreed that the babies looked centrally pink. At 10 minutes the majority of students, nurses, NPs and physicians agreed that the baby looked centrally pink; the majority of RTs, however, favored completely pink. Maximal central “pinkness” occurred at 4 minutes of life and corresponded with a desaturated hemoglobin of 2.9 g/dL and an O2 sat of 80%. Average hemoglobin in our infants was 15 g/dL, average initial pH was 7.3.

Conclusions: Women, younger observers, and students/RTs tended to say the baby was centrally pink earlier than men, older observers, and nurses/nurse practitioners/physicians. Respiratory therapists tended to say the infant was completely pink earlier than all other groups. Transition points between cyanosis/centrally pink/all pink occur at 1 minute and probably 11 minutes of life.
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POLYCYTHEMIA IN AN OBESE MALE

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Introduction: Polycythemia is a diagnosis made based on an elevated hematocrit, hemoglobin concentration and/or elevated red blood cell count. Since these values are concentrations, polycythemia can be relative (occurring when plasma volume is decreased), absolute, or a combination of both. Absolute polycythemia is further subdivided into primary and secondary polycythemia. Primary polycythemia is a result of a mutation (inherited or acquired) of red blood cell precursors. Secondary polycythemia is a result of either appropriate or artificial increases in erythropoietin. Physiologically appropriate polycythemia can be seen in patients living at high altitudes, with hypoxia-associated diseases (most commonly chronic obstructive pulmonary disease (COPD) or chronic obstructive sleep apnea (OSA)), carbon monoxide exposure, heritable conditions resulting in abnormal oxygen sensing, erythropoietin-producing neoplasms, as a side effect of testosterone therapy in patients with hypogonadism or in athletes using anabolic steroids. Combined polycythemia is most commonly seen in smokers.

Case report: A 48-year-old morbidly obese male scheduled for an outpatient elective umbilical hernia repair was brought to the emergency department (ED) after he was found to have significantly decreased oxygen saturations while in the preoperative area. Upon arrival at the ED, his SpO2 was 89% on room air with a respiratory rate of 19 and no signs of respiratory distress. His past medical history was significant for hypertension and gout. He denied feeling ill, and had no complaints of dyspnea, fatigue, or chronic cough. Home medications included hydrochlorothiazide and lisinopril. He did not have a history of supplement or testosterone use. Social history was significant for distant tobacco use, and he was employed as a landscaper. He did state that his father had a history of “thick blood,” but he was unaware of any diagnosis or treatment. In the ED, D-dimer, B-type natriuretic peptide, and a complete metabolic panel were within normal limits. An arterial blood gas showed a respiratory acidosis and metabolic alkalosis with an increased pCO2 of 53.4, significantly decreased pO2 at 39, elevated bicarbonate at 29.8 with a SpO2 of 70% on room air. Red blood cell count, hemoglobin and hematocrit were all elevated at 8.47, 22.4, and 74.2%, respectively. White blood cells were 5.2 x 103/µL, and platelets were decreased at 97 x 103/µL. MCV was within normal range at 87.3. A repeat CBC verified these findings. Portable chest x-ray revealed no abnormalities. Pulmonology and hematology were consulted from the emergency department. The patient was admitted to the family medicine service. Hematology started phlebotomy with 1:1 replacement of removed blood volume with normal saline. Aspirin 325 mg daily and prophylactic low-molecular weight heparin were started. Serum studies for JAK-2 and BCR-ABL mutations were negative. Erythropoietin was slightly elevated at 22.5 mIU/mL (2.6-18.5). A bone marrow aspirate demonstrated hypercellular marrow, erythroid hyperplasia and increased megakaryocytes. Further bone marrow cytometric studies revealed no evidence for monoclonality, non-Hodgkin’s lymphoma, or acute leukemia. Chest and abdominal computed tomography revealed no evidence for tumor polycythemia or underlying lung disease. Transthoracic echocardiogram was negative for left-to-right intracardiac shunt. Overnight oximetry studies revealed nocturnal hypoxia; however it was inconsistent with chronic OSA. Patient’s hypoxia responded well to night-time continuous positive airway pressure (CPAP).

Discussion: Despite a family history suggesting a primary cause of polycythemia, the low arterial oxygen saturation noted on this patient’s ED admit is the more likely etiology for his diagnosis. In agreement with the negative bone marrow biopsy and genetic studies, the elevated serum erythropoietin is consistent with a secondary cause such as nocturnal hypoxia. The patient was discharged home with CPAP following his elective umbilical hernia repair.
LARGE VOLUME HYMENOPTERA ENVENOMATION IN 20 YEAR-OLD MALE

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Introduction: Hymenoptera is a species consisting of bees, yellow jackets, wasps, hornets and some fire ants. Stings from these insects can cause minor local reactions such as erythema, edema and pain at the site of envenomation, significant local reactions such as deep tissue edema lasting days and/or life threatening systemic reactions including anaphylaxis in susceptible hosts. Most hymenoptera stings are self-limited and require little more than supportive measures like cold compresses and elevation. More significant local reactions may require a short course of high dose oral steroids. Anaphylaxis, occurring in 3% of all stings, is treated in the typical manner with IM epinephrine, oxygen and airway management, glucocorticoids, albuterol and H1 and H2 antihistamines. In this case report, we review a young non-allergic patient who received > 1,000 hymenoptera stings resulting in multiple organ dysfunction, widespread local tissue edema without respiratory compromise or anaphylaxis.

Case Report: A 20 year-old previously healthy male military enrollee suffered >1,000 Africanized bee stings while mountain hiking off trail. He became trapped and was air lifted to the local level 1 trauma center. In the field he was noted to have significant upper and lower extremity edema and erythema and was given IM epinephrine and IV diphenhydramine en route to the hospital. He reported significant pain at sting sites and vomited once but denied dyspnea. His initial vitals were: BP 149/94, HR 113, RR 25 (95% on room air), temp 99.2 F. On exam the patient had a patent non-edematous oropharynx, was tachycardic and tachypneic but lungs were clear to auscultation and abdomen was non-tender. His skin was diffusely tender to palpation, edematous and erythematous with punctate lesions containing stingers; areas of greatest involvement were those left uncovered. Relevant initial laboratory results were as follows: BUN, Cr 2.1, K 2.8, AST 148, ALT 27, PT 16.8, INR 1.34, CK 1773, ionized calcium 1.11. Chest X-ray was unremarkable. He was given methylprednisolone 125mg IV, diphenhydramine 50mg Q6h, famotidine 20mg BID, aggressive IVF and analgesia. Stingers were removed and ice compresses were placed. On day 4, when CK was greatest (>41,000 IU/L), the patient had increased upper extremity edema, decreased ROM and slightly decreased pulses concerning for compartment syndrome. Fortunately, with supportive measures, surgical fasciotomy was not necessary. The patient’s acute kidney injury, transaminitis (AST 1837, ALT 185 day 3), hypokalemia and hypocalcemia improved over his 10 day hospital admission. He was discharged in good condition on H1 and H2 antihistamines and was ambulating without assistance.

Discussion: If this patient had a bee venom allergy, had significant airway involvement or was in poor health he may have perished. Instead, this large volume envenomation resulted in a massive confluent local skin reaction worrisome for compartment syndrome. Direct envenomation additionally resulted in rhabdomyolysis that contributed to kidney and liver injury. Similar cases have been reported in India, some resulting in cardiac ischemia. Together, these cases underscore the importance of monitoring integument, muscle, kidney and liver sequelae in the first few days following large volume hymenoptera envenomation.
DEVELOPMENT OF A MULTIDISCIPLINARY QUALITY IMPROVEMENT CLINICAL FORUM: IMPROVING PATIENT OUTCOMES ACROSS THE CONTINUUM OF CARE

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Purpose: Undergraduate, graduate and continuing medical education have not historically provided education or competencies for physicians in quality improvement methodology, which will be increasingly important as reimbursement and incentives change as a result of value-based purchasing and health care reform. The need for integration of quality improvement education in both undergraduate, graduate (GME), and continuing medical education (CME) is paramount for providing good patient care. Patients receive healthcare from medical teams across outpatient, emergency, and inpatient settings. Despite an understanding of the need to integrate care across outpatient and inpatient settings, there is under-utilization of metrics across the continuum to monitor and ensure high quality care and outcomes. Therefore, as we approach quality improvement it is important to travel with the patient analyzing metrics across the continuum of care and focusing quality improvement education on the whole patient picture rather than clinical silos.

Methods: As part of the AIAMC National Initiative III, Scottsdale Healthcare developed a process in which quality improvement education occurred at the GME and CME level while also evaluating quality metrics across the continuum of care. Using the A3 process we developed a quarterly multidisciplinary clinical forum. Key subject leaders including Attendings and Family Medicine Residents in the outpatient, emergency room, and inpatient setting were identified to be forum educators and moderators. Core quality measures from each clinical milieu were analyzed and presented with a hallmark case following a patient across the continuum of care. Subject leaders identified gaps in care or in monitoring of care via review of quality metrics across the continuum. Pre- and post-forum surveys on the current level of understanding of quality improvement were given to the audience participants comprised of physicians, nurses, physician assistants, quality experts, and social workers. Surveys were scored using Likert scales. Forums were opened to audience question and answer sessions after the presentations allowing for further exploration of the topics. Our initial topics included pediatric asthma and congestive heart failure.

Results: Surveys demonstrated that the majority had a previous experience (64%) with QI, while a significant number had a working knowledge (40%) of QI and interest in providing QI leadership (48%). Post-surveys indicated that 84% of audience participants felt that had a better comprehension and competency of QI. Seventy percent agreed that they would apply QI methods across the continuum of care.

Conclusion: We concluded that the multidisciplinary clinical forum educated the audience at both the GME and CME levels on quality improvement methodology, appropriate quality metrics for the given topic and clinical environment, and provided an understanding of the importance of monitoring the patient across the continuum of care. Forum presenters were also able to identify patient care and quality metric gaps or redundancies within the Scottsdale Healthcare system. Future work will include review of the subject quality metrics three months from the given forum to determine if there was improvement. The results of these reviews will be presented at the Scottsdale Healthcare hospital quality committee meetings. Longitudinally, participation in this forum will be incorporated permanently as part of the Scottsdale Healthcare Family Medicine residency quality improvement curriculum and will be linked to required medical staff physician education.
A UNIQUE PRESENTATION OF COCCIDIOIDOMYCOSIS (VALLEY FEVER) IN A 19 YEAR-OLD FEMALE

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Introduction: Coccidioidomycosis (Valley Fever) is an infection caused by a fungus (C. immitis or C. posadasii) endemic to the lower deserts of the western hemisphere including southern Arizona, southern California, southwestern New Mexico and west Texas. The cumulative incidence of infection in endemic areas is approximately 28 per 1 million persons; in Arizona it is as high as 155 cases per 100,000 persons. Risk of exposure to Coccidioides in endemic areas is approximately 3% per year and one study showed that people who were diagnosed with Valley Fever had lived in Arizona, on average, for 16 years at the time of diagnosis. Most infections are acquired through inhalation of spores and are often subclinical. The exact proportion of cases that require medical attention is unknown, but most often the patient will present with pulmonary symptoms and is often manifested as community acquired pneumonia (CAP) approximately 7-21 days after exposure. In one study, 29% of patients initially diagnosed with CAP tested positive for Valley Fever. Commonly, presenting symptoms include chest pain, cough, fever, and rarely hemoptysis which may suggest a cavitary lesion in the lung. We report a case of an unusual presentation of Valley Fever in a young woman.

Case Report: A 19 year old female presented to our Emergency Department (ED) with 3 weeks of cough and shortness of breath. She had been stretching out her back, felt a jolt of back pain and subsequently a cough developed. Later that day she presented to the ED of another hospital and was sent home with the diagnosis of pleurisy and some cough syrup, without a chest X-ray (CXR). The cough persisted and she went to a minute clinic at a local pharmacy where she was instructed to follow up with her primary care physician (PCP). At her PCP’s office she was given an antibiotic for a presumed bronchitis and was sent for a CXR. She had the CXR done a few days later which was a total of 3 weeks after the onset of symptoms. When the report came to her PCP the patient was called and instructed to come to our ED. Her outpatient CXR was reviewed and it was confirmed that she had a complete right-sided hydropneumothorax. A chest tube was placed in the ED and she was admitted to our hospital. A CT scan of the chest was done to evaluate the lung as it re-expanded. This showed a moderate right-sided hydropneumothorax with multiple, diffuse foci of parenchymal consolidation in the right lung, and was reported as “likely infectious, with right hilar lymphadenopathy.” Because of this she was started on Levaquin and Diflucan empirically, until her Coccidioidomycosis IgG and IgM came back positive, at which point the Levaquin was discontinued. The pulmonologist and cardiothoracic surgeon on the case credit the Valley Fever infection as the cause of her spontaneous pneumothorax. After 5 days she developed a new air leak and eventually had to have right upper lobe and right lower lobe wedge resections with mechanical pleurodesis. A Cocci granuloma was seen and removed in the operating room and sent for culture. She tolerated the procedure well and after an uneventful recovery she was discharged from the hospital. She was sent home on an antifungal regimen for her Valley Fever lasting approximately 6-12 months as directed by an infectious disease specialist and with close follow up by pulmonology and her PCP. She is expected to have no significant sequelae from the wedge resections that were required.

Discussion: This case is particularly notable for its unique presentation of Valley Fever with a spontaneous pneumothorax in a young person. Even a young, relatively healthy person with few clinical signs of illness can have an aggressive and serious Valley Fever infection. If she had received a CXR earlier they likely would have diagnosed this sooner and, possibly, prevented some of the subsequent complications, including wedge resections.
A CASE REPORT OF REVERSIBLE CEREBRAL VASOCONSTRICTION SYNDROME

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Introduction: Reversible cerebral vasoconstriction syndrome (RCVS) is a rare neurological disorder that is associated with multifocal arterial constriction and dilation. While etiology and pathophysiology are incompletely understood there is an association with the postpartum period and several vasoactive substances. The typical presentation of RCVS is one of sudden severe headaches, often thunderclap in nature. The disease can be associated with focal neurological deficits, intracranial hemorrhage and seizures. It is typically a self-limited disease process that resolves spontaneously in 1-3 months. Treatment is currently based on expert opinion. We report a case of this rare and little understood disease process.

Case Report: A 52 year-old female with a past history of migraine headaches presented to the local emergency room with complaint of severe sudden onset headaches that were different than her normal migraines as well as nausea, vomiting and left sided weakness. She reported her typical symptoms of sensitivity to light and sound, but these headaches lasted longer, were more frequent, and were not responding to her typical headache medications. On initial exam in the emergency room the patient was noted to have left upper and lower extremity weakness with strength graded 4/5. Her initial brain CT showed nonspecific right frontal and parietal lobe cortical and subcortical areas of edema possibly representing strokes. Her subsequent MRI revealed progressive multiple infarcts in the parietal, frontal, and occipital lobes bilaterally as well as the right temporal lobe. CTA of the head demonstrated segmental narrowing and dilatation (string of beads) of multiple cerebral arteries. Lumbar puncture was performed and CSF was normal and without evidence of infection. Echocardiogram was completed and was negative for thrombus or vegetation. The patient was treated with high dose corticosteroids, the calcium channel blocker nimodipine, as well as vasopressors to maximize cerebral perfusion. During the patient’s hospital admission her left sided weakness became total left upper and lower extremity paralysis with right lower extremity weakness as well. Initial repeat imaging showed progressive infarcts. After a week of aggressive therapy as outlined above, repeat CTA of the head demonstrated improvement in the areas of vascular narrowing previously noted suggesting improving RCVS. The patient was taken off of vasopressors and continued on corticosteroids and nimodipine. She did regain movement of the first three digits on her left hand as well as wrist extension on the left. She was eventually transferred out for intensive physical therapy to address the neurologic deficits that remained.

Discussion: A patient with a history of migraines presented with atypical headaches of sudden onset and associated left sided weakness. Ultimately her CTA of the head confirmed RCVS as the etiology and workup for other etiologies was negative. While the disease process did begin to abate the patient was left with the neurological consequences of this rare disease process.
DIFFICULTY IN DIAGNOSING JUVENILE IDIOPATHIC ARTHRITIS IN THE EARLY PEDIATRIC POPULATION: A CASE STUDY

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Introduction: Juvenile Idiopathic Arthritis (JIA) is a collection of chronic rheumatic diseases in childhood. Comprising 10-20% of all JIA cases, systemic JIA is characterized by arthritis, quotidian fevers, diffuse erythematos rash and lymphadenopathy.2,3 Patients present with anemia, high leukocyte and platelet counts, and elevated ESR and CRP.3 A lack of definitive diagnostic testing makes sJIA a diagnosis of exclusion, requiring infectious and neoplastic causes of symptoms to be eliminated prior to diagnosis. This case study exemplifies the difficulty of sJIA diagnosis.

Case: An 8-month-old female presented to the ED with a 1 month history of intermittent erythematous rash and a six day history of fever, congestion, and eye discharge. Physical exam revealed T38.9ºC, bilateral mucoid eye discharge, clear rhinorrhea, dull TMs with erythema and a diffuse maculopapular blanching rash. The patient was discharged with diagnoses of acute otitis media, URI with conjunctivitis, and erythema multiforme.

The patient re-presented to the ED two weeks later with daily fevers, rash and a new finding of periungual desquamation of the left great toe. The patient was admitted with an ID consult for concern of Kawasaki’s disease. Labs showed a WBC 17.3, CRP 10.4, ESR 41, ALT 99 and AST 136. The patient was treated with IVIG, placed on aspirin therapy and discharged home.

One week later, the patient returned with persistent fevers and rash. Labs revealed a maximum WBC 20.1, ESR 116, CRP 7 and Coombs-positive hemolytic anemia, an assumed effect of IVIG therapy. The first indication of a potential rheumatic process was noted when the infant whimpered during a joint exam while asleep. Subsequent MRI of her lower extremities was consistent with JIA. Additional work-up revealed C3 218, C4 25.2, ASO positive, dsDNA negative, and RF negative. The infant was treated with 3 days of high dose IV pulse steroids with significant symptomatic improvement and discharged home on oral steroids. Prednisolone was tapered and Anakinra begun in outpatient follow-up.

Discussion: sJIA diagnosis is made difficult by the lack of definitive testing and requires a high clinical suspicion. On initial presentation, the short duration of symptoms and lack of joint findings increased probability of an infectious cause of illness. Diagnosis of sJIA can be obscured further by age-related joint exam limitations allowing remaining symptoms to be given an alternative cause, such as Kawasaki’s disease during the case patient’s second presentation. Creative exam maneuvers and a broad differential are key to diagnosis of sJIA in the very young infant.
Abstract 59

13-YEAR-OLD FEMALE PRESENTING WITH SYMPTOMS OF CONSTIPATION FOUND TO HAVE ACUTE INTUSSUSCEPTION

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Introduction: Abdominal pain is a common complaint presenting in all ages of pediatric patients and accounts for a significant percentage of office and emergency room visits. Etiologies range from serious or potentially life threatening surgical cases to relatively benign self-resolving illnesses. Common etiologies vary based on patient age which guides a clinician’s initial evaluation and management. Typical diagnoses encountered in teenage patients include infectious gastroenteritis, constipation and appendicitis. In contrast, intussusception occurs before the age of two in 80-90 percent of cases. This form of intestinal obstruction results from invagination of proximal bowel into distal which can lead to ischemia and perforation if not identified and treated in a timely manner. Intussusception is usually seen at the ileocecal junction and when occurring in early childhood it is typically idiopathic in origin. This case identifies a common complaint as the presentation of an uncommon diagnosis.

Case Presentation: An otherwise healthy 13-year-old female presented to the emergency department with a three day history of intermittent abdominal pain. She had a history of mild constipation and reported that her last bowel movement was two or three days prior to evaluation. At presentation her pain was associated with daily non-bloody, non-bilious emesis. Her vital signs on arrival showed: T 36.3C, HR 131, and BP 148/9. An initial exam described her as moderately distressed with abdominal distension, a palpable “left stool mass,” normal bowel sounds and diffuse tenderness with guarding and without rebound tenderness. Acute constipation was a concern and an abdominal x-ray was obtained to evaluate the stool burden. This showed a non-obstructive bowel gas pattern with air filled loops of colon at the splenic flexure with some retained stool noted in the ascending and descending colon. Following these results, the patient was treated for constipation and received two enemas, oral senna and magnesium citrate, all with little effect. Abdominal pain and vomiting persisted and a repeat exam was completed suggestive of an acute abdomen. The second exam showed continued distress, increased abdominal distension, tenderness in the epigastrium and right lower quadrant with rebound tenderness and voluntary guarding. Labs and abdominal CT scan were then ordered. A CBC showed leukocytosis of 20.2 with 86 percent neutrophils, her CMP was normal and a pregnancy test was negative. A CT scan of the abdomen illustrated intussusception of the distal ileum with surrounding inflammatory changes and free fluid in the pelvis; but no evidence of free intraperitoneal air. At this time, surgery was consulted and their initial exam was recorded as benign. An ultrasound was then completed to ensure CT findings of intussusception were persistent. Approximately 12 hours after arrival in the emergency department, persistent ileo-ileoal intussusception was confirmed and the patient was taken to the operating room for open exploratory and diagnostic laparoscopy resulting in 30cm excision of small bowel surrounding the intussusception with Meckel’s diverticulum as a lead point.

Discussion: This case is highlighted by an atypical diagnosis of intussusception in a teenage patient identified after initial treatment for constipation had failed to relieve the presenting symptoms. Initial evaluation must always include a full differential remembering that while common causes are diagnosed most commonly, when therapies or studies do not yield the expected results, further evaluation is necessary. While unexpected at 13 years, intussusception can occur but will not often present with the expected colicky abdominal pain, sausage shaped mass and bloody stools; therefore, a high index of suspicion is essential. Older children also require a full workup for evidence of a lead point to the intussusception; in this case a previously asymptomatic Meckel’s diverticulum was the culprit.
ACUTE DYSPNEA AND HEMOPTYSIS AFTER DENTAL IMPLANTATION

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Introduction: The anti-neutrophil cytoplasmic antibody (ANCA) positive vasculitides are a group of conditions characterized by circulating antibodies to neutrophil proteins, resulting in small to medium vessel inflammation. Almost any organ system can be affected, however the upper and lower respiratory, renal, and mucocutaneous tissues are most frequently involved. They are rare, with an estimated incidence of approximately 20-100 cases per million patients; if untreated, they carry a mortality in excess of 90% at one year. Many causes have been identified, including chemical and drug exposures, as well as post-infectious etiologies. Anecdotal cases have recently been reported of ANCA-positive vasculitides associated with dental implantation.

Case Description: MT, a 43 year old male presented to a local emergency department complaining of fatigue and cough of six weeks' duration, along with a purpuric rash, diffuse arthralgias, gross hematuria, and mild hemoptysis of one week's duration. The patient admitted only to a recent history of nasal polyp disease developing over the prior two months, and surgical placement of dental implants three months prior. He adamantly denied any history of prior medications, asthma, or chemical exposures, save for working in pool maintenance. Physical examination revealed palpable purpuric lesions, diffusely concentrated on extensor surfaces of upper and lower extremities as well as an obstructing nasal polyp. Initial laboratory evaluation revealed a leukocytosis with eosinophilia, an elevated CRP, and gross hematuria on urinalysis. Imaging of the chest revealed bilateral large patchy infiltrates with adjacent ground-glass opacities. A biopsy of the patient's skin lesions demonstrated leukocytoclastic vasculitis with prominent eosinophils. The diagnosis of ANCA-positive vasculitis was confirmed with markedly elevated anti-proteinase-3 antibodies. Corticosteroids were initiated, resulting in immediate improvement in symptoms; the patient was able to be discharged soon after with close rheumatologic follow-up.

Discussion: This manifestation is atypical in that characteristics of both Allergic Granulomatosis with Eosinophilia (AGE, formerly Churg-Strauss Syndrome) and Granulomatosis with Polyangiitis (GPA, formerly Wegener's) were present. Prominent peripheral and perivascular eosinophilia are consistent with AGE, however the presence of anti-proteinase-3 antibodies and lack of history of asthma both strongly indicate GPA.

While currently no strong association between dental implants and MP's condition has been elucidated; cases of ANCA-positive vasculitides, particularly AGE after dental implantation, are being reported. MT did have exposures to silica, which has been shown to induce such illness, in the form of diatomaceous earth in his role as pool maintenance worker; however the patient denied such exposures for the prior six to eight months. Furthermore, the temporal association between dental implantation and initiation of disease seen here and in other cases suggests a relationship to be investigated.

This case is instructive in that it demonstrates ANCA-positive vasculitides as a clinical spectrum, with many overlapping features among diseases. Although rare, the severe implications of both the disease itself and subsequent chronic immunosuppressive treatment mandate that the practicing internist have facility with recognition of instigating factors as well as prompt diagnosis and treatment.
ABDOMINAL SPINAL FLUID PSEUDOCYST WITH DELAYED PRESENTATION OF HYDROCEPHALUS: A CASE REPORT

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Introduction: Cerebrospinal fluid (CSF) pseudocysts are a rare complication of ventriculoperitoneal (VP) shunting and may be associated with low grade infection. Typically, patients become symptomatic with hydrocephalus from shunt malfunction.

Case Report: A 34-year-old female with a history of coccidiomycosis meningitis and VP shunt presented with acute onset nausea, ataxia, and subjective diplopia. Initially she had no headaches or abdominal pain. Abdomen was soft and non-tender to palpation. On admission she was not shown to have hydrocephalus. During her stay, she developed worsening symptoms including head-aches. Subsequent imaging demonstrated hydrocephalus. Abdominal imaging further demonstrated a large pseudocyst at the terminus of the patient's VP shunt. The shunt was removed and an external ventricular drain was placed. Cultures were negative. A new VP shunt was eventually placed contralaterally but the peritoneal terminus was found to be coiled within adhesions in the abdomen. The peritoneal end of the catheter was then laparoscopically freed and placed within the free peritoneal space. At 6 weeks follow up, patient has been well.

Discussion: CSF pseudocysts typically present with hydrocephalus or abdominal pain. Approximately one-third are presumed to be secondary to infection. This report demonstrates an interesting case of pseudocyst due to delayed presentation with hydrocephalus.
INTRACTABLE PAINFUL RASH IN HEPATITIS C PATIENT WITH CRYOGLOBULINEMIA

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Introduction: Dermatologic disease is one of the extrahepatic manifestations of hepatitis C infection. One such entity is hepatitis C virus-related essential mixed cryoglobulinemia and vasculitis. Cryoglobulinemia is a systemic disorder affecting the skin, kidneys, joints, reticuloendothelial system and nerves. Herein is reported a case of HCV-related cryoglobulinemia with persistent skin disease despite treatment with ribavirin and interferon and undetectable hepatitis C virus RNA. It was only after adjuvant therapy with boceprevir that the patient’s resistant skin lesions finally improved.

Case report: A 60-year-old white female with hepatitis C was admitted to the hospital for management of new onset renal insufficiency found on routine blood tests. She complained of generalized body aches, fatigue and intermittent rashes on her back, abdomen and legs. She reported a three-year history of multiple erythematous to violaceous skin lesions on her thighs, legs and feet. On physical exam, she had some abdominal tenderness and nonpalpable, nonblanching, violaceous, 4-6 mm macules on her lower extremities. The ensuing work up revealed a high HCV viral load, hematuria, proteinuria, hypocomplementemia, cryoglobulinemia along with elevated rheumatoid factor, positive ANA and dsDNA. Initial punch biopsy of the skin showed vasculopathy with deposition suggestive of cryoglobulins. A kidney biopsy to assess renal disease showed membranoproliferative glomerulonephritis (MPGN). She was started on combination therapy of intravenous methylprednisolone and plasmapheresis for cryoglobulinemia and discharged once stable. Within two months of the diagnosis of cryoglobulinemia, she was started on subcutaneous pegylated interferon alfa-2a (IFN) every week, along with oral ribavirin every day. Her HCV viral load and the cryoglobulin level became undetectable one month after starting HCV therapy, but the skin rash did not remit. She was referred to a dermatologist for management of the skin lesions. A repeat skin biopsy again showed leukocytoclastic vasculitis (LCV). She was treated with topical steroids, which resulted in minimal relief of the painful skin lesions. Plasmapheresis was stopped three months after initiating HCV therapy. Finally, after being on treatment with IFN and ribavirin for five months, she was started on boceprevir. Her skin lesions showed remarkable improvement within a month of its institution. In addition, all of the previously abnormal positive serologies including RF, ANA and dsDNA, as well as cryoglobulins, also became negative after therapy with boceprevir. No further recurrences of the skin lesions had occurred at the time of writing of this abstract. She received the HCV treatment for one year, which included 5 months of boceprevir therapy.

Discussion: LCV is a cutaneous vasculitis which may occur in conjunction with essential cryoglobulinemia in hepatitis C. Management of LCV in such a setting may be very challenging. Treatment of hepatitis C, immunosuppressive therapy and plasmapheresis have all been advocated for the treatment of mixed cryoglobulinemia. In the case above, the patient initially presented with LCV rash, MPGN, cryoglobulinemia and various positive autoimmune serologies which forced us to consider a possible diagnosis of systemic lupus. It is interesting that despite having undetectable HCV RNA in the serum on treatment with IFN and ribavirin, the patient continued to have recurrent vasculitic skin lesions. It was only after sustained therapy with boceprevir that her lesions improved. This leads us to believe that HCV treatment with IFN and ribavirin may fail to cause resolution of LCV rash, and that addition of boceprevir to the patient’s treatment likely resulted in clearing of the HCV from sanctuary sites, such as the bone marrow, brain cells and lymphocytes, where viral replication may continue undetected despite IFN and ribavirin therapy.
PERCEPTION OF POWERPOINT PRESENTATIONS BY ATTENDINGS AND TRAINEES

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**Purpose:** The transfer of knowledge is a significant component of medical education. Since its release, PowerPoint has become the primary method for a presenter to communicate knowledge to an audience. A small body of research has assessed the ways in which presentation skills are developed, how presenters are trained to use PowerPoint presentations, and how presentations are delivered to audiences. Few studies have assessed perception of PowerPoint presentations. The purpose of this study was to examine similarities and differences in trainee and attending physician perceptions of aspects of PowerPoint presentations. It was hypothesized that attendings would view PowerPoint presentations more favorably than would trainees with respect to 1) effectiveness of presentations, 2) attention paid to the presenter, and 3) qualities of the presentation (e.g., use of images, font size, and amount of text per slide).

**Methods:** A 28-item survey was developed and administered in person at the 59th Annual Meeting of the American Academy of Child and Adolescent Psychiatry (AACAP). Participants included medical students, psychiatry residents, child/adolescent psychiatry fellows, and attending physicians. There were 50 respondents: 25 attendings and 25 trainees. Trainees consisted of eight medical students, seven psychiatry residents in their 2nd year of training or higher, and 10 fellows.

**Results:** For attendings, information presented via PowerPoint contributed more strongly to learning than was reported by trainees, but attendings did not perceive presentations as influencing their practice as much as did trainees. More than half of the trainees and nearly half of attendings reported feeling distracted while viewing PowerPoint presentations. Trainees reported feeling fatigue more often during presentations than did attendings. Having food available during presentations was more important to trainees than to attendings. Discriminant analysis revealed a significant difference in the number of questions asked during a presentation ($F_{(1,48)} = 4.13$, $p = .04$), with trainees asking more questions. There was a marginally reliable difference in who engaged in unrelated work done during a presentation ($F_{(1,48)} = 3.82$, $p = .05$), with trainees tending to be distracted by other tasks while watching a PowerPoint presentation. Our model correctly classified 70% of all cases as either attendings or trainees. These results should be interpreted with caution, given that our predictors were more than moderately correlated.

**Conclusion:** No stark contrasts were identified between attending physicians and trainees on the survey, but the data suggests dissatisfaction with certain aspects of presentations was expressed by both groups in areas such as overreliance on PowerPoint as a teaching tool and presenters’ difficulty finishing a presentation without rushing or skipping to a conclusion. Other areas of dissatisfaction could be inferred from the variation reported in how many slides should be in an hour-long presentation. In addition, both groups perceive some problem with text size and text amount. An argument could be made that more effective and attention-sustaining presentations are required to facilitate teaching. Residency programs may need to incorporate training in the development of effective audio-visual presentations or create standards for presentations.
Abstract 64

FATAL BACTEREMIA IN A PATIENT WITH ANGIOIMMUNOBLASTIC T-CELL LYMPHOMA

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Introduction: Among the peripheral T-cell lymphomas, angioimmunoblastic T-cell lymphoma is one of the more common types and arises from peripheral follicular helper T-cells, which are CD4 positive. Initial presentation is usually with systemic symptoms accompanied by generalized lymphadenopathy, and an excisional lymph node biopsy will reveal the diagnosis. It tends to affect the older population, patients older than 60 years of age, and is diagnosed at very late stages. There is no specific therapy for these patients. Remission can be attained in many patients using chemotherapy; however, relapses are very common. Systemic infection is the most common cause of death in angioimmunoblastic T-cell lymphoma. We report a fatal case of hospital-acquired bacteremia with multi-drug resistant *Acinetobacter baumannii* in a patient with angioimmunoblastic T-cell lymphoma, immediately after undergoing chemotherapy.

Case Report: A 65-year-old female with no significant past medical history presented with bilateral lower extremity swelling, pain, and redness with an inability to walk. She had associated constitutional symptoms including fevers, chills, night sweats, weight loss, and fatigue. Physical exam was notable for fever, bilateral diffuse cervical and inguinal lymphadenopathy, and edema of the lower extremities. Routine blood tests were essentially normal, and DVT was ruled out by ultrasound. She underwent a CT scan of her neck, which showed diffuse hyper-dense cervical lymphadenopathy, with the largest lymph node measuring 1.8 cm. She proceeded to an excisional lymph node biopsy for suspected lymphoma, and two weeks after discharge, results confirmed angioimmunoblastic T-cell lymphoma with an atypical B-cell proliferation. The patient returned to the hospital complaining of persistent fevers, chills, night sweats, anorexia, tachycardia and increased cervical lymphadenopathy. She was started on broad spectrum intravenous antibiotics. Despite treatment, she remained febrile and cultures were negative; therefore, antifungal therapy was started. After her first round of chemotherapy, she developed acute hypoxemic respiratory failure secondary to left upper lobe pneumonia. Despite treatment with broad spectrum antibiotics and aggressive medical therapy, she expired within hours after transfer to the intensive care unit. The results of her blood and respiratory cultures were obtained the day following her death and showed multi-drug resistant *Acinetobacter baumannii*, only sensitive to tobramycin.

Discussion: It is well known that in most patients with peripheral T-cell lymphoma, including angioimmunoblastic T-cell lymphoma, the cause of death is a systemic infection, such as multi-drug resistant (MDR) bacteria. *A. baumannii* is an aerobic gram negative bacillus with a high incidence in immune-compromised individuals. Although not considered part of normal flora, it has been found to colonize skin, and is frequently isolated from the respiratory tract of infected individuals. It is one of a handful of serious MDR pathogens that have become an expanding concern within the medical community. Studies show this organism has a truly remarkable mechanism to switch genomic structures under the pressure of usual first line antibiotics in order to become resistant. Could empiric treatment with the newer antibiotic agents, which would theoretically have less resistance, be of benefit for these patients after chemotherapy? Further clinical trials are warranted for progression of disease and therapeutic approaches.
GASTROINTESTINAL AMYLOIDOSIS

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Introduction: Amyloidosis is caused by the deposition of abnormal protein within tissues. There are several different types of amyloidosis. Primary amyloidosis (AL) is associated with the deposition of light chains most commonly found in the serum and the urine. AL type can occur alone or it can occur with other plasma cell disorders, such as multiple myeloma or Waldenstrom’s macroglobulinemia. We present a case of suspected systemic amyloidosis presenting with primarily GI symptoms.

Case report: A 62-year-old Hispanic female presented with a five year history of intractable diarrhea, with up to 10 episodes per day of loose, watery stools, and two year history of dysphagia. Over the five months prior to admission, she had experienced a greater than 30 pound weight loss. Initially laboratory studies focused on infectious, malabsorptive and autoimmune etiologies that were unremarkable. CT scans of chest/abdomen/pelvis did not demonstrate any probable source of her symptoms. Interventional imaging modalities, laryngoscopy and fluoroscopic esophagography exhibited normal filling and motility, with some evidence of GERD. An EGD demonstrated tissue changes consistent with H.pylori infection and colonoscopy was unremarkable. Biopsies were obtained from all segments of the GI tract during EGD/colonoscopy and demonstrated significant protein deposition in the mucosa consistent with amyloidosis at all levels of the GI tract. During hospitalization, patient’s diarrhea was recalcitrant to every pharmacologic intervention tried. She experienced acute respiratory failure, and was subsequently diagnosed with advanced pulmonary amyloidosis and restrictive cardiomyopathy, likely secondary to systemic amyloidosis, but no further biopsies of lung or heart were obtained due to her condition and lack of treatment options. Ultimately, it was the patient’s and the patient’s family’s decision for hospice care.

Discussion: Gastrointestinal amyloidosis is associated with depositions throughout the GI tract, with the greatest amount typically found in the small intestine. Deposition in the small intestine leads to diarrhea, steatorrhea, protein-losing enteropathy, and malabsorption; all of which can result in severe weight loss. Tissue biopsies are diagnostic and are most definitive when obtained directly from the GI tract, most commonly the rectum. Biopsies can also be obtained from the subcutaneous fat tissue. Congo red is the most specific stain and amyloid deposits will appear red in normal light and have apple-green birefringence in polarized light. Upper endoscopy may reveal thickened gastric folds, along with erosions or polyps. Therapy of AL is directed towards suppression of immunoglobulin light chain synthesis, through controlling the plasma cell dysfunction. This is most commonly achieved using chemotherapeutic agents, most commonly melphalan with prednisone. Because of the toxicity of these medications, this regimen is reserved for individuals without renal or cardiac dysfunction. Even when treated with melphalan and prednisone, patients still have a poor prognosis, with a median survival of less than two years. Symptomatic treatment is often the best there is to offer with patients that have systemic and progressive disease. Octreotide may be used by patients with refractory diarrhea and protein loss.
SEVERE CHEST TRAUMA FROM A 500LB GRANITE SLAB REPAIRED WITH RIB PLATING: A CASE REPORT

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Introduction: Rib fractures are common occurrence in trauma patients, with causes owing to blunt trauma and, less frequently, penetrating trauma. When fractures occur in multiple segments of consecutive ribs, a flail chest is seen, which causes severe respiratory distress. Seen in 6% of all trauma patients, a flail chest is a severe injury with morbidity. Complications arising from rib fractures include pneumonia, fracture non-union, and respiratory failure. Management of rib fractures is primarily targeted at controlling analgesia. Flail chest currently is the only indication for surgical management of rib fractures. Here we report a case in which a patient was quickly weaned off the ventilator after rib plating.

Case Report: A 54-year-old male arrived at a medical center after having a 500 lb. block of granite slab fall on his right chest. The patient was standing on the flat bed of a semi-truck, lost his balance and the slabs then landed on his chest. He arrived and was found to have decreased oxygen saturations in the 70’s, paradoxical chest movements, and neck and chest wall crepitus. He was then emergently intubated. He was found to have a right tension pneumothorax, which was treated with tube thoracostomy. He also had a left pneumothorax and had a chest tube placed, which was subsequently found to be located in the lung parenchyma on CT scanning. Additionally, on CT scan the patient was found to have pneumomediastinum, pneumopericardium with massive subcutaneous emphysema and chronic lung disease. He was then transferred to the intensive care unit in critical condition. He was unable to maintain his tidal volumes and large bilateral air leaks were noted in the Pleura-Vacs. He was then taken urgently to the operating room for a left thoracotomy and repair of a bronchopleural fistula. In the immediate post-operative period, the patient remained intubated and required low positive end-expiratory pressure in an effort to preserve his lung repair. Due to the anticipation that the patient would require prolonged ventilator support, he underwent a percutaneous tracheostomy four days after his admission. Over the next week, the patient continued to require increased pressure support, and it was decided to take the patient to the operating room for rib plating. After the patient returned from the operating room, he was weaned completely off of the ventilator in less than 72 hours, with further care continued at a rehab facility.

Discussion: Severe chest trauma with multiple right-sided rib fractures and a flail segment requiring rib plating. Flail chest is described as the paradoxical movement of a segment of chest wall caused by fractures of 3 or more ribs anteriorly and posteriorly within each rib. Due to the concern for underlying lung injury, this is a serious medical condition. This condition has been traditionally treated with adequate analgesia and pulmonary toilet. Surgical treatment is still rarely used, but it is becoming increasingly popular as more literature is published about its benefits in decreasing ICU stays, ventilator-acquired pneumonia, and length of hospital stay. There are several techniques described to perform rib plating and can be simplified into short and long implants. Early rib plating led to improved pulmonary function status, decreased pain increased ventilator weaning.
CALCINOSIS CUTIS: SYMPTOMATIC CUTANEOUS CALCIUM DEPOSITS AFTER FAILED MEDICAL MANAGEMENT

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Introduction: This is a case report of 22-year-old Hispanic woman with dermatomyositis, myositis with calcinosis cutis, history of Reynaud’s phenomenon, protein S deficiencies resulting in requiring the right little finger amputation, and chronic pain syndrome secondary to the dermatomyositis. Despite aggressive medical therapy of the dermatomyositis, and myositis with systemic corticosteroids and topical steroids, IVIg, mycophenolate mofetil, hydroxychloroquine, infliximab and methotrexate, patient continued to developed progressive calcinosis cutis of the elbows, wrists, knees and thighs and buttocks. When patient was diagnosed with protein S deficiency, warfarin was started. During this time, patient developed new red, indurated, boggy and painful subcutaneous nodules. Imaging suggests calcinosis cutis; an 8mm punch biopsy showed chalky white liquid material extruding from the wound. A surgical consult was obtained for incisions and draining of these various deposits of calcium (calcinosis cutis) around her sacral and gluteal musculature that were causing severe pain and substantially affecting her quality of life.

Case Report: This is a retrospective, single case report. The patient was treated at the Maricopa Medical Center in 2012. Initially, the patient was taken to the operating room for an incision and drainage of the above mentioned sites. Intra-operatively, the drainage expressed was chalk-like, semi-solid calcium deposits. These were different from the rock-hard solidified calcium deposits that were throughout her body and easily palpated over several joints. Since the index operative intervention, the patient has undergone two more surgical drainage procedures of newly developed calcinosis cutis subcutaneous nodules, as well as one less invasive drainage placement by Interventional Radiology, in a period of approximately 8 weeks. Each time liquid calcium deposits were drained, it provided relief from her pain, and there is no reaccumulation of calcinosis cutis. Her multiple surgical interventions resulted in a relative decrease in calcium load in those affected areas, which have resulted in an improvement in pain, functionality and overall quality of life of this patient.

Discussion: Review of the literature show that calcinosis cutis is a complication of dermatomyositis with or without myositis. There are often recurrences of calcinosis cutis, and once this occurs, there are few successful therapeutics. The best treatment is to treat the dermatomyositis aggressively, but even dermatomyositis can be difficult to treat, as in this patient, with the various immunosuppressive medications. The calcinosis cutis in this patient has been treated with the following: sodium thiosulfate, calcium channel blockers, promidronate and warfarin. Given the large numbers of lesions, surgical excision was not our first choice in therapeutics. However, with the introduction of warfarin, the calcinosis cutis lesions remain in the liquid state, allowing surgical debridement with secondary wound healing, which has been helpful for this patient.
Abstract 68

NOVEL FINDING OF PHOSPHATURIC MESENCHYMAL TUMOR OF THE BRAIN: A CASE REPORT

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Introduction: The phosphaturic mesenchymal tumor mixed connective tissue variant (PMT-MCT) is a very rare, histopathologically distinctive tumor that is frequently misdiagnosed as other mesenchymal tumors. Cases of PMT-MCT have been identified in a variety of soft tissues (thigh, foot, hand, flank, hip, groin, back, arm, deltoid, leg, abdominal wall) and osseous tissues (femur, sacrum, phalanx, metacarpal, iliac crest, spine, mandible, tibia), but has never been seen in the brain. Often associated with osteogenic osteomalacia (OO), the cases without known OO were histologically identical to the typical PMT-MCT. Expression of the fibroblast growth factor 23 (FGF-23) protein has been seen in 81% of immunohistologically analyzed samples, and in 100% of those analyzed by RT-PCR.

Case Report: An eight-year-old Native-American female woke up with severe headaches. She was unable to walk due to severe imbalance. She was ataxic on physical exam. Computed tomography (CT) showed hemorrhagic brain tumor. Extensive imaging work up showed densely enhancing partially calcified ruptured lesion in the right cerebellar hemisphere with obstructive hydrocephalus. Surgical resection via right retrosigmoid approach craniotomy with gross total resection was performed. Due to the unusual features of this tumor, pathological analysis was performed identifying a benign solid and cystic neoplasm with histologic features that overlap between aneurysmal bone cyst and phosphaturic mesenchymal tumor. Molecular study (reverse transcriptase polymerase chain reaction, RT-PCR) for FGF-23 mRNA was positive, consistent with the majority of phosphaturic mesenchymal tumors. FISH analysis of this tumor for USP6 fusion gene was negative. Approximately 70% of ABC contain USP6 fusion genes. Follow up CT and MRI imaging showed no residual tumor or abnormality. By six months follow up, there were no residual symptoms and no deficits in vision, balance, or coordination. At two year follow up, she was still doing well.

Discussion: In 1987, Weidner and Santa Cruz published a seminal histological analysis and coined the term “phosphaturic mesenchymal tumor – mixed connective tissue variant” and also identified other less common variants: osteoblastoma-like, nonossifying fibroma-like, or ossifying fibroma-like. In 2004, Folpe et al reported on 32 of their own cases and a thorough review of all literature comparing the clinical features and diagnoses and offering revised diagnoses where applicable. In 2004, Folpe found immunohistochemistry and RT-PCR identification of FGF-23 to be a crucial part of the diagnosis, (81% and 100% respectively for that cohort). Many PMT-MCT present with longstanding osteomalacia, but in the absence of osteomalacia, they were able to make the diagnosis on the basis of histologically identical features plus FGF-23 expression. Our differential diagnosis included chondromyxoid fibroma with aneurysmal bone cyst. Further quantitative analysis (positive FGF-23 on RT-PCR, and negative USP6 on FISH) refined our diagnosis and confirmed PMT-MCT. This is the first time that this type of tumor has been found in the brain.
Abstract 69

APPENDICEAL ENDOMETRIOSIS PRESENTING AS CHRONIC LEFT LOWER QUADRANT PAIN: A CASE REPORT

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Introduction: The appendix is no stranger to tumors; they generally present as intussusceptions or incidentalomas. About 1% of all appendectomy specimens will contain a tumor, most commonly carcinoid, benign and malignant mucocoeles, adenocarcinomas, and adenocarcinoids. Symptomatic intussusceptions of the appendix, although extremely rare, usually present with symptoms of acute abdomen or as recurrent appendicitis. Those reported are most commonly associated with cystic fibrosis, juvenile and adenomatous polyps, but endometriosis has been described as well. Depending on whether preoperative diagnosis of the mass has been made, these masses have been removed by endoscopic polypectomy, endoscopic appendectomy, appendectomy, and right hemicolectomy. Asymptomatic intussusceptions of the appendix have been described during surgical evaluation for pelvic mass in patients with endometriosis. Endometriosis is a common disorder and affects about 10-15% of menstruating women. The bowel is involved in 5-37% of patients. The most commonly involved intestinal sites are the rectum and sigmoid colon, followed by the small intestine, cecum, and appendix. Endometriosis with appendiceal involvement tends to be asymptomatic and may be found at primary or incidental appendectomy. Patients with symptoms typically have chronic abdominal pain, but the pain may be abrupt in onset, resembling that of acute or recurrent appendicitis. In a case series of women with biopsy-proven endometriosis who presented with right lower quadrant pain, appendectomy was performed, and none of the specimens showed appendiceal evidence of endometriosis.

Case Report: A 51-year-old female presented to clinic with a complaint of dull left lower quadrant pain for several months. She had no inciting incidents, and her pain had no temporal relationship to her menses. She had a computed topography scan showing a 3 cm appendiceal mass at the base. She had already undergone a colonoscopy, which confirmed the mass in the appendix (no biopsy performed) and had found no other colorectal lesions. She had reported no history of symptoms associated with endometriosis. She underwent uncomplicated laparoscopic appendectomy, with no evidence of endometriosis intra-abdominally. The final pathology report showed endometriosis and fecalith without appendicitis. On follow-up, the patient reported complete resolution of her symptoms.

Discussion: Endometriosis of the appendix is extremely rare; the literature suggests a prevalence of 0.05%. I have anecdotally seen many patients with chronic pain where no source has been found, and very infrequently, operating on them has led to some resolution of the pain. This may just prove there is a large placebo component. Unless the patient had some anatomical aberration, an appendiceal mass would not explain LLQ. However, endometriosis has been found in several cases, and its location does not always relate to location of the pain as perceived by the patient. While usually associated with known endometrial disease or acute onset abdominal pain from intussusceptions or appendicitis, our case does not fit into any pattern previously described. As such, it reinforces the investigation and appropriate workup of abdominal pain when it presents.
Abstract 70

A UNIQUE MULTI TEAM COLLABORATION IN SUCCESSFUL MANAGEMENT OF A
SEVERE FORM OF MALIGNANT CATATONIA: CONSECUTIVE SESSIONS OF ECT AND
USE OF NON DEPOLARIZING MUSCLE RELAXANT

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Introduction: Catatonia is characterized by abnormal movements and speech and behavior disturbances,
and is associated with medical, psychotic, drug-related, and neurological disorders. Malignant catatonia
(MC) is a severe manifestation of catatonia marked by autonomic instability, fever and waxy flexibility.
Current treatments include anticonvulsive drugs, benzodiazepines (BZD) and electroconvulsive therapy
(ECT). Although ECT treatment has been used to treat MC in psychiatric patients with long histories of
psychotropic use, its application in cases of acute MC patients while intubated is not widely reported.
Prompt diagnosis and treatment with BZD and/or ECT is critical to avoid devastating symptoms of MC.

Case Report: A 20 year old Hispanic male with no past psychiatric history presented to a local hospital
due to manic symptoms, psychosis, and confusion. He was sent to an urgent psychiatric center (UPC)
where he received Haloperidol, Olanzapine, Diphenhydramine, and Lorazepam before admission to the
inpatient Psychiatric unit. He developed tachycardia, fever and waxy flexibility. Because of autonomic
instability, he required transfer to the general medical unit of the hospital and subsequently to the medical
intensive care unit (MICU). His condition worsened with ongoing mutism and altered mental status.
Multiple laboratory tests (creatine phosphokinase, serum ammonia, HIV testing, hepatitis, HSV, anti N-
Methyl-D-Aspartic Acid Antibody (NMDA), blood culture, and cerebrospinal fluid analysis, among
others) and diagnostic imaging (including computed tomography and magnetic resonance of the brain),
revealed no organic etiology for his deteriorating condition. The patient received his first of 12 ECT
treatments with a non-depolarizing muscle relaxant to avoid K+ overload. Following the completion of
this first treatment, he required intubation which resulted in aspiration pneumonia. Accordingly,
subsequent ECT treatments were delayed for 4 days, awaiting resolution of pneumonia. However, due to
the critical status of the patient, it was decided that additional ECTs would be performed while patient
was intubated, with a brief removal of intubation immediately before the ECT. However, to protect
patient against additional episodes of aspiration pneumonia, the last 3 episodes of ECT were done while
patient was intubated. The patient’s condition gradually improved to permit return to the psychiatric unit
on day 49. He was discharged home on day 63.

Discussion: A case is presented of malignant catatonia in a newly symptomatic psychiatric patient, with
no past history of psychotropic use. Diagnostic challenges, including the difficulty distinguishing
between MC and neuroleptic malignant syndrome, the role of neuroleptic medication in medication naïve
patients, and the necessary collaboration between psychiatric and medical staff in providing effective
treatment for this condition, are discussed.

Also, it is noteworthy to point out that the delays in the management of the patient due to the medical
complications might have likely delayed his recovery. Once intubated and the pulmonary status was
stabilized, ECT proceeded with progressive improvement. ECT treatment and close collaboration
between psychiatric personnel and MICU staff proved an effective approach for optimal management of
this life-threatening condition.
Abstract 71

TENSION HEMOTHORAX FOLLOWING ULTRASOUND-GUIDED CHEST TUBE PLACEMENT: A CASE REPORT

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Introduction: Tension hemothorax is a life-threatening medical condition, characterized by hypovolemic shock, anemia and respiratory compromise. While a hemothorax is usually the result of blunt or penetrating trauma to the chest, it may also occur as the result of iatrogenic injury during various procedures, including central intravenous line placement, thoracostomy tube placement, thoracentesis, percutaneous liver biopsy, and anterior or posterior spinal surgery. Specifically, thoracostomy tube placement may lead to hemothorax secondary to intercostal artery laceration. Elderly patients are more susceptible to this complication due to the increase in tortuosity of intercostal arteries and decrease of the rib-to-intercostal artery distance. While tube thoracostomy drainage is the primary mode of treatment for hemothorax, a small percentage will require operative intervention.

Case Report: A 73-year-old female was found to have bilateral pleural effusions on chest CT, accompanied by increasing ventilator needs. Interventional radiology was consulted to place bilateral chest tubes to facilitate drainage of the effusions. Using ultrasound guidance, a 12-French pigtail catheter was inserted into the right pleural effusion, with return of serosanguinous fluid. A similar catheter was inserted into the left pleural effusion, with return of straw-colored fluid. A chest x-ray the following morning demonstrated significant improvement in both effusions. However, 24 hours later, patient was found to be hypotensive and tachycardic, and required blood transfusions, vasopressors and increased ventilator settings. A chest x-ray demonstrated complete opacification of the right hemithorax. A 36-French chest tube was placed with return of approximately one liter of blood. Overnight, patient continued to require both blood and vasopressors; serial x-rays showed rapid re-accumulation of hemothorax, and hemoglobin continued to decrease despite multiple transfusions of packed red blood cells. The patient was eventually taken to the operating room for a right anterolateral thoracotomy. Findings included a tension hemothorax, as well as a hematoma cavity at the site of thoracostomy tube. 2.5 liters of clotted blood was evacuated, and two 36-French chest tubes, one straight and one curved, were placed within the right thoracic cavity. Post-operatively, patient experienced a rapid increase in oxygen saturation and a decreased need for vasopressor therapy.

Discussion: Gradual onset followed by rapid accumulation of right-sided hemothorax following placement of ultrasound-guided chest tube calls attention to this case. While the patient’s condition was complicated by therapeutic anticoagulation, as well severe sepsis, thoracotomy and drainage of 2.5 liters of clotted blood led to immediate improvement of patient’s clinical picture.
Introduction: The uncommon association between aortic stenosis (AS) and gastrointestinal bleeding (GIB), known as Heyde’s syndrome, was first described in 1958. Subsequent reports described patients with AS and angiodysplastic GI bleeding who had an acquired form of von Willebrand disease (vWD). It has been hypothesized that the AS causes shear stress-dependent cleavage of von Willebrand factor that leads to GI bleeding. Angiodysplasia is usually located in the cecum or ascending colon and can be identified at colonoscopy. Small intestinal angiodysplasia which is beyond the reach of conventional endoscopy is difficult to diagnose, and it can be identified by angiography, wireless capsule endoscopy or enteroscopy. Therapeutic options depend on the clinical setting, but include the use of argon plasma coagulation at colonoscopy, bowel resection or right hemicolecotomy. Several reports revealed aortic valve replacement (AVR) was able to correct the bleeding from angiodysplasia, or at least prevent recurrent GI bleeding. However, GIB in the context of Heyde’s syndrome is not considered an indication for AVR. In these cases, medical decisions are complex and difficult.

Case report: A 55-year-old white female presented to the emergency room for increasing lightheadedness and melena for one week. The patient had similar symptoms two months prior during a trip and was only treated with transfusion without any additional GI evaluation. Her past medical history included morbid obesity, HTN, HCV and AIDS. On physical exam she was pale and tachycardic with peripheral edema 2+/4 and a grade 4/6 ejection systolic heart murmur radiating to the neck. Her hemoglobin was 5.4 mg/dl, hematocrit 16.5%, and platelet count 78,000/mm³. The patient received intravenous fluids and transfusion of packed red blood cells. Her echocardiogram showed increased LVEDP, severe aortic stenosis with peak pressure gradient 78.41mmHg/40.75mmHg, aortic valve area 1.0 cm² and calcific degenerative valvular disease. She underwent EGD and colonoscopy, which showed no identifiable source of bleeding. Initial nuclear tagged RBC study and aortogram/mesenteric angiogram were unremarkable. Capsule endoscopy showed active small bowel bleeding with most likely source as the jejunum. Subsequent push enteroscopy failed to reach the part of small bowel seen bleeding on capsule endoscopy. The following day she underwent exploratory laparoscopy followed by exploratory laparotomy, with intraoperative push enteroscopy which found active small bowel bleeding. She had resection of approximately 30 cm of ileum. Despite the resection, she continued to bleed. Selective superior mesenteric artery angiogram showed evidence of active bleeding and angiodysplasia of the right colic branch, and a coil embolization was performed, which was unsuccessful in stopping the bleeding. The presence of GIB from angiodysplasia and AS suggested the diagnosis of Heyde’s syndrome. During this time, she received multiple transfusions, DDAVP and aminocaproic acid. Initially, vWD was suspected; however, all studies for vWD were negative except for prolonged aPTT. The GIB continued and she required frequent transfusions. Consensus from specialists was that AVR would be the best way to treat the underlying condition. Coronary angiography was performed, which showed no significant coronary obstructive disease, and the patient was scheduled for elective AVR surgery.

Discussion: This report presents an illustrative case of severe Heyde’s syndrome (severe GI bleeding in the presence of significant AS) with failed medical, surgical and interventional radiological treatments to stop bleeding. Management of patients with severe aortic stenosis and GI bleeding is complex. AVR potentially provides definitive therapy with considering evidences of patients, when their hematological abnormalities and bleeding episodes were reversed by aortic valvular replacement.
Abstract 73

TRANSPERINEAL PERCUTANEOUS DRAINAGE OF PROSTATIC ABSCESS: A REVIEW AND REPORT OF TWO CASES

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Introduction: Prostatic abscess is an uncommon condition that is most likely to occur in the elderly and immunocompromised; optimal outcome requires prompt diagnosis and treatment. Current treatment consists of abscess drainage and appropriate antibiotic therapy. Delay in diagnosis can result in severe complications, such as rupture with fistulization into adjacent structures, sepsis, and death. Although the clinical presentation of prostatic abscess may include LUTS, fever, chills, or sepsis, these common signs may be absent, which can make diagnosis difficult.

Historical reported mortality rates of prostatic abscess ranged from 6% to 30%, with more recent reported mortality rates of 3% to 16%. In 1920, Alexander Randall described methods of prostatic abscess drainage that included transurethral blind rupture of the abscess, transrectal drainage, transperineal incision with digital rupture, and transperineal incision into the abscess cavity under direct visualization. Currently, prostatic abscess drainage is primarily performed via percutaneous drainage, with or without transrectal ultrasound guidance.

Case Reports: Patient #1: An incarcerated 22-year-old man presented to emergency department after experiencing approximately three weeks of right sided testicular pain with radiation to the right gluteal region, right scrotum, and right perineal region. Upon presentation, he was on day eight of treatment with trimethoprim/sulfamethoxazole for prostatitis. Despite antibiotic therapy, the pain he was experiencing continued to increase. Physical examination was significant for an enlarged prostate and tenderness of the right epididymis. Laboratory values were significant for an elevated WBC count of 15.8. A CT scan of the abdomen and pelvis with IV contrast showed several contrast enhancing fluid collections in the region of the inferior prostate and anterior rectum; the largest measured 4.9 by 3.1 by 2.8 cm.

Patient #2: A 60-year-old man presented to the emergency department after experiencing two weeks of abdominal pain located in the right upper quadrant, left lower quadrant, and suprapubic region. He also had jaundice and subjective fevers at presentation. He denied any urinary symptoms. Vital signs were significant for blood pressure of 85/58, heart rate of 112, and temperature of 38.6. Physical examination was significant for diffusely tender abdomen and hepatomegaly. Laboratory values were significant for total bilirubin of 11.6, AST of 133, ALT of 92, and alkaline phosphatase of 352. A CT scan of the abdomen and pelvis with IV contrast showed thickened gallbladder wall, calculi obstruction of the gallbladder neck, and an enlarged prostate with a fluid collection measuring 3.0 by 3.2 cm.

Both patients were taken to the operating room in order to undergo surgical treatment with transperineal incision and drainage of the prostatic abscess. Both abscesses were drained and both patients were treated with IV antibiotics.

Discussion: The infrequent occurrence and variable presentation of prostatic abscess may result in difficulty diagnosing the condition, which can delay treatment. Two common causative mechanisms of prostatic abscess include reflux of infected urine into prostatic ducts and hematogenous spread from a distant site. Elderly individuals with bladder outlet obstruction are more likely to acquire prostate abscess due to reflux, with the most common organism being E. coli. Hematogenous spread has a more variable age distribution and the most common organisms involved are Staphylococcus species.

The combination of prompt diagnosis, drainage, and antibiotic therapy are will ensure effective treatment of prostatic abscesses. Transrectal ultrasound imaging for diagnosis and guided drainage are currently common methods of diagnosis and treatment for prostatic abscess.
EFFECTS OF BENEFIT CHANGES ON INPATIENT PSYCHIATRIC READMISSION RATES

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Purpose: In December 2007, the United States entered a recession. Soon after, a series of fiscal changes were implemented that directly affected mental health care. In July 2010, budgetary cuts affected people with serious mental illness (SMI) status, but not those with Title XIX benefits. Title XIX (TXIX) in Arizona represents those who receive AHCCCS, Arizona’s form of Medicaid. Case management services were cut; these services have been shown to prevent re-hospitalization (Kolbasovsky, 2010). After July 2010, both SMI and TXIX status were required for case management. It was hypothesized that more people might require psychiatric rehospitalization in the Maricopa Integrated Health System (MIHS) following funding cuts, given that MIHS receives all county involuntary admissions. This retrospective chart review compared rates of readmission before and after benefits changes in four patient groups.

Methods: Electronic records were reviewed from MIHS admissions from January to December of 2010 (six months before and six months after the change in benefits). Four patient groups were created: SMI and non-TXIX, SMI and TXIX, non-SMI and TXIX, and non-SMI and non-TXIX. Data were analyzed using SPSS software to examine readmission rates in groups. Readmission rates were compared by quarter.

Results: A total of 2,681 admissions were reviewed. There were 808 non-SMI/non-TXIX patients, 615 non-SMI/TXIX patients, 466 SMI-non-TXIX patients, and 792 SMI/TXIX patients. The overall readmission rate for all groups combined during 2010 was 9%. Comparing readmission rates by quarters controlled for population change. There was an upward trend in readmission rates in all four groups. The increase in readmission rates from Quarter 2 to Quarter 3 (the middle of which was July 2010, when benefits changes occurred) was 0.01 for non-SMI/non-TXIX, 0.00 for non-SMI/TXIX, 0.04 for SMI-only, and 0.07 for SMI/TXIX. Readmission rates were compared for the SMI population before and after benefit cuts. Rates for individuals with SMI/TXIX were 0.08 before the changes and 0.17 after July 2010. Readmission rates for the SMI/non-TXIX group were similar (0.09 before the cuts and 0.16 after the cuts). There was a statistically significant increase in readmission rates over time, regardless of SMI and TXIX status (p < .0005). Also, readmission rates were significantly higher for the SMI population than for the non-SMI population (p < .0005).

Conclusions: During 2010, an overall increase in readmission rates was observed for all psychiatry patients regardless of benefits status. It was anticipated that readmission rates for those with SMI benefits but not TXIX prior to July 2010 would be similar to rates in the group with both SMI and TXIX after the change, because both groups had case management services. The readmission rate for the SMI but no TXIX group increased as expected; however, so did the rate for individuals with SMI and TXIX services. It was not clear that a loss of case management services was the reason for increased rehospitalization. It is possible that data collected over a longer period of time than one year would clarify trends in readmission rates to a greater degree. Other reasons for higher psychiatric readmission rates in 2010 could include 1) training police officers in the identification and admission of individuals with SMI to urgent psychiatric centers (thus increasing admission volume), 2) the economic decline during the study time frame, which may have increased stress and symptomatology in the population, and 3) a rise in the abuse of new and novel substances that produce psychiatric symptoms. A limitation of the study is that the MIHS population does not represent the entire county. Future studies combining data from systems across the county could provide more generalizable results.
THE EFFECT OF INCREASED INTRAVENOUS HYDRATION ON LENGTH OF LABOR AT TERM

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Purpose: Previous studies have demonstrated a significant reduction in the length of labor of nulliparous women in spontaneous labor when given an increased rate of intravenous fluid. Adequate hydration is required for fetal oxygenation, as well as for the delivery of nutrients and elimination of wastes from the working myometrium during labor. The purpose of this study was to determine if increasing the rate of intravenous fluid for all women in labor or undergoing induction of labor at term will decrease the length of labor.

Methods: Standard rate of intravenous fluids given to pregnant women at term with a singleton fetus in cephalic presentation was increased to 250 mL per hour from 125 mL per hour previously. All women included in this study planned for a vaginal delivery. The length of labor of these women was then compared via chart review. One hundred thirty women who were admitted after the change in standard intravenous fluid rates was instituted were compared to one hundred thirty women admitted prior to the change.

Results: Demographic data were similar between the two groups. 85 percent of women in the 125 mL per hour group were of Hispanic ethnicity, 83 percent of women in the 250 mL per hour group were. Over 75 percent of both groups were multiparous. Contrary to our hypothesis, women receiving a higher rate of IV fluids spent reliably more time in labor ($F_{(1,244)} = 7.00, \eta^2 = .03, p = .01$), with an average of 11.35 hours ($SD = 8.43$) vs. 9.15 hours ($SD = 7.40$) in the lower IV fluid rate group. This was a small-to-moderate effect, accounting for 3% of the variance in labor time. In contrast to prior studies, nulliparous women showed no reliable difference in labor time with treatment (15.12 hours vs 15.22 hours, $p = .97$). Additionally, women with initial dilation of at least four spent reliably more time in labor with treatment (8.10 hours vs 6.35 hours, $p = .02$).

Conclusion: This study does not replicate previous studies that showed a decreased length of labor in women given a higher rate of intravenous hydration during labor. In fact, the overall effect was the opposite of that shown in prior studies. However, this study included multiparous women as well as women not already in spontaneous labor (those who underwent induction of labor). This study is the first to look at increased hydration during labor for these groups of women. Although it showed that the length of labor for all women studied actually increased with an increased rate of IV fluid, this study does demonstrate that further research is needed in this area: a decrease in length of labor could potentially lead to fewer adverse or undesired labor outcomes, such as cesarean delivery, postpartum hemorrhage, or peripartum infectious morbidity.
Abstract 76

POTT'S PUFFY TUMOR CAUSING SUPERIOR SAGITTAL SINUS THROMBOSIS AND CONCURRENT VENOUS EPIDURAL HEMATOMA

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Introduction: Pott’s puffy tumor arises from intracranial extension of frontal sinusitis. Calvarial osteomyelitis leads to boney erosion with resultant soft tissue inflammation and edema contributing to the characteristic presentation. With intracranial extension, thrombosis of the superior sagittal sinus may occur. We report a case in which a patient suffered both superior sagittal sinus thrombosis and a venous epidural hematoma. The simultaneous occurrence of both findings in the setting of Pott’s puffy tumor has not been reported.

Case Report: A 13-year-old male presented to an outside hospital with a 10-day history of headaches, fevers, and chills. A lumbar puncture, performed to rule out meningitis, was normal. He was discharged after one dose of IV antibiotics, but returned with ongoing symptoms. A CT head was obtained showing an intracranial fluid collection concerning for an abscess. The patient was transferred to our facility two weeks after symptom onset, for higher level of care. On arrival, he complained of a bifrontal headache, worsening right-sided forehead and periorbital swelling, and ongoing fevers. On exam, visual fields and all cranial nerves were intact. His GCS was 15 and neurological exam was non-focal. All extremities had full strength. Consults were placed to neurosurgery, infectious disease, ENT, and the pediatric ICU team. Empiric vancomycin and meropenem were started at meningitic doses, and a contrasted brain MRI and non-contrasted maxillofacial CT were obtained. These studies confirmed the presence of a 6.9cm x 7cm x 3.5 cm epidural fluid collections adjacent to the right frontal lobe, with associated 4mm right-to-left midline shift with opacification of the bilateral frontal sinuses and left ethmoid and maxillary sinus. The patient was taken to surgery, where a craniectomy of osteomyelic bone was performed, along with evacuation of the abscess and associated hematoma, cranialization of the frontal sinus, pericranial pedicled flap reconstruction of the skull base, and transnasal evacuation of the left maxillary sinus. The abscess was found to have caused superior sagittal sinus thrombosis and hemorrhage of the overlying epidural venous system, leading to an epidural hematoma. Cultures of the abscess grew Streptococcus intermedius. On post-operative day one, the patient was following commands and moving all extremities. Extubation was uneventful, and by post-operative day four, he was tolerating a regular diet. Antibiosis was deescalated to meropenem, then to ceftriaxone based on sensitivities. The patient was discharged on day seven, with a PICC line in place to complete a five-week course of ceftriaxone. He was followed by infectious disease on a weekly basis as inflammatory markers resolved. At five weeks, he was deescalated to oral amoxicillin to complete his eight-week course. The patient was seen in neurosurgery clinic three weeks after discharge, and by that time, had resumed nearly all of his usual activities and was attending school. The long-term plan is for the patient to undergo cranioplasty one year from the date of his initial presentation to reconstruct the frontal bone.

Discussion: Pott’s puffy tumor with associated superior sagittal sinus thrombosis is a well-described consequence of frontal sinusitis. The presence of an epidural hematoma in addition to those findings, as presented in this case is unique, and thus far never been reported as a sequela of this disease.
USE OF BIRTH CONTROL IN POST PARTUM PATIENTS THAT DO NOT INTEND TO GET PREGNANT WITHIN THE NEXT YEAR

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Purpose: Currently in the United States, approximately 49% of all pregnancies are unintended, and 21% of women give birth within 24 months of a previous birth. Increased use of highly effective postpartum contraception is an important strategy to both prevent unintended pregnancy in the postpartum period and to prevent short inter-pregnancy intervals. There is limited information available on interventions that increase the likelihood of a woman to use birth control in the postpartum period. One multistate study reported that 88% of patients between 2 and 9 months PP are using a method of birth control. The aim of this study was to gather data to determine various factors that may help to increase compliance with a method of birth control in the postpartum period when they are not intending to have another pregnancy right away. The intent was to identify barriers both external (cost and logistics) and internal (patient beliefs and attitudes), in order to hopefully determine strategies to increase the use of highly effective birth control methods postpartum, as well as to determine compliance rates within our patient population for various methods of contraception.

Methods: A longitudinal study of women during the first 6 postpartum months was conducted. Patients from the Maricopa Women’s Care Center were identified as being recently postpartum and invited to participate in the study. Research staff conducted interviews and filled out surveys at 4 to 6 weeks, as well as 6 months postpartum.

Results: 209 total patients were enrolled in the study. Of those enrolled, complete data was available for 111 patients. In this population, 94 percent of patients were still using a method of birth control at the 6-month visit, and 52.3 percent were using the same method at both visits. Of the patients that selected a long-term contraception method and implemented this, 97 percent were still using this method at 6 months postpartum. Five people were found to be pregnant at the 6-month follow-up.

Conclusion: In our patient population, 52.3 percent of patients reported consistent use of the same birth control method between the initial postpartum visit and at an evaluation 6 months postpartum. Patients who obtained a long-acting form of birth control postpartum had excellent continuation rates at 6 months postpartum. In this small study, lack of financial assistance was the biggest reason patients who desired long-acting contraception were not able to obtain this reliable form of birth control. Multiple factors such as insurance, education, primary language, partner involvement, and relationship with provider were assessed to see if they caused a patient to be more consistent with birth control choice. None of these factors were found to have significant influence on continued use of the method chosen at the initial postpartum visit.
SUCCESSFUL LARGE VOLUME CEREBROSPINAL FLUID ASPIRATION FOR AN ACCIDENTAL OVERDOSE OF INTRATHECAL CYTARABINE

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Introduction: We report a case of accidental intrathecal (IT) cytarabine overdose in a patient with pre-B cell ALL, who was treated with large volume cerebrospinal fluid (CSF) aspiration through Ommaya reservoir. The pharmacokinetics, side effects and treatment options in cases of IT cytarabine overdose are reviewed.

Case Report: A 45-year-old woman with pre-B cell ALL was started on induction chemotherapy with Hyper-CVAD regimen. The patient received her 2nd planned dose of IT cytarabine (labeled as 100 mg in 5 ml) through the Ommaya reservoir on day 11 of chemotherapy. Patient tolerated the procedure well and continued to be asymptomatic. Forty-five minutes after the instillation, pharmacy informed team of an error by which 500 mg/5 ml of cytarabine had been mixed and mislabeled as 100 mg/5 ml. After discussion with a multidisciplinary team, it was decided to perform a large volume aspiration of the CSF. Being severely neutropenic, our patient was at high risk for infections if a CSF exchange procedure was performed. Hence it was felt that CSF aspiration would be a better option for her. Also, the risk of brainstem herniation after large volume drain is rare except in the presence of increased intracranial pressure. 54 ml of CSF was aspirated from the Ommaya reservoir over 25 minutes. The procedure was terminated when the patient reported headaches and had an episode of vomiting. The CSF was minimally xanthochromic with an elevated glucose level of 86 mg/dl, normal protein level of 23 mg/dl, also 2 nucleated cells/mm$^3$ and 422 RBC/mm$^3$ were noted. Cytology did not reveal any residual malignant cells. The patient had a few episodes of vomiting after the CSF aspiration that were controlled with anti-emetics. She was discharged in stable condition after 48 hours. Three months after the incident, the patient continued to be asymptomatic, with no neurologic signs or symptoms.

Discussion: Cytarabine (Ara-C) is a naturally occurring deoxycytidine analog that exerts its antineoplastic effect as a competitive inhibitor of DNA polymerase or by incorporation into DNA. Intravenously administered cytarabine is degraded to its inactive metabolite uracil arabinoside (Ara-U) by cytidine deaminase. Cytidine deaminase concentration is very low in the central nervous system. Hence cytarabine elimination from CSF is primarily by bulk flow, which is a physiological active transport of the drug into the blood from the CSF. Accidental overdoses of IT chemotherapy have been reported, but mostly with methotrexate (MTX). This is the first reported case of IT cytarabine overdose in an adult. The only other reported case involved a 4-year-old boy with ALL who accidentally received 200 mg of IT cytarabine and was treated with CSF exchange with isotonic saline. He developed ataxia and subsequently died three months later. There are many reports of IT MTX overdose variously treated with immediate removal of the CSF (either by drainage, exchange or ventriculolumbar perfusion), systemic and/or IT administration of corticosteroid and leucovorin. In most cases, therapy can be guided by plasma and CSF MTX levels. As cytarabine levels cannot be measured in commercial labs, there is no effective way to guide treatment. It seems crucial to quickly remove as much drug as possible from the CSF. Large volume CSF tap from Ommaya reservoir is a possible treatment option for patients with IT chemotherapy overdose. The same procedure can be attempted through a spinal approach if the patient does not have an Ommaya, but close monitoring in a critical care setting with neurosurgical service on standby is recommended. The patient’s neurologic signs and symptoms can be used to guide the amount of CSF drained.
AUTOLOGOUS FAT GRAFTING AS AN AUTOLOGOUS REGENERATIVE MATRIX IN KNEE OSTEOARTHRITIS

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Purpose: The objective of this retrospective, observational study was to determine, for patients with knee osteoarthritis (OA), 1) the safety of an Autologous Fat Graft (AFG) as an Autologous Regenerative Matrix (ARM), and 2) whether serial injections of AFG and bone marrow (BM) would result in pain reduction and functional improvement.

Methods: All patients between October 2009 and March 2012 with symptomatic radiographically confirmed knee osteoarthritis of all grades who elected to be treated with ARM. 36 knees from 26 patients were included. Patients were evaluated using WOMAC and VAS pain scales initially and at each subsequent visit. Age, height, and weight were also collected. The initial radiographs were graded using the Kellgren-Lawrence classification. Patients were injected with an ARM consisting of an AFG and concentrated BM.

Results: Mean time from initial injection was 7 months. Patients with low grade (grade 1-3) osteoarthritis had a significant improvement in WOMAC total, pain, stiffness and physical function (59.6%; 61.2%; 52.7%; 59.5%; all with p < 0.001) and maximal pain noted on VAS (47.1% p < 0.001). Current pain noted on VAS was not statistically significant. High grade OA (grade 4) improved, but statistically insignificantly. When compared with data for intra-articular corticosteroid and hyaluronic acid viscosupplementation, the ARM is more effective for a longer period of time, and is at least as effective as PRP.

Conclusion: In this case series, we found that AFG as an ARM is a promising, safe, cost-effective, natural and efficacious treatment option for younger patients with grade 1-3 OA.
EVOLVING MANAGEMENT OF ALCOHOL WITHDRAWAL SYNDROME (AWS): IMPACT ON ICU COURSE AND COMPLICATIONS

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Purpose: Most instances of AWS are mild and can be managed in an outpatient setting. Severe AWS requires hospital, and frequently ICU, admission and management. Complications are largely respiratory, including pneumonia and the need for intubation (I) and mechanical ventilation (M/V), with prolonged ICU and hospital length of stay (LOS). Although benzodiazepines are primarily used for sedation, other agents including dexmedetomidine and propofol are increasingly used as supplemental agents. We previously reviewed a large cohort of patients with severe AWS who required ICU management in which lorazepam was the primary sedative. There have been subsequent changes in sedation practice at our institution with a trend towards the use of multiple agents, including benzodiazepines. We compared the course of AWS of ICU patients in 2010 with our prior study to assess the effects of changes in sedation practice with emphasis on respiratory complications and LOS.

Methods: We retrospectively reviewed all adult patients with primary or secondary ICD-9 diagnoses of AWS admitted to our facility from January 1, to December 31, 2010, with focus on those admitted or transferred to the ICU. Clinical features, demographics, complications as well as ICU and hospital LOS were recorded and compared to those from our earlier study which included a nearly identical cohort of patients with primary diagnoses of AWS from January 2005 to August 2007. The IRB approved the study and waived the requirement of informed consent. Patient identity was protected. Each admission was scored as a separate episode. The CIWA-Ar Scale, and the Ramsay scale (interval 1), or RASS (interval 2) were utilized. Statistical analysis was performed using the SPSS software; a p value of <0.05 was considered statistically significant.

Results: During intervals 1 and 2 there were 279 and 288 episodes of AWS, respectively. Male patients represented 91% and 93% with a mean age of 45.8y and 44.5y, respectively. During interval 1, 31.2% were admitted or transferred to the ICU vs. 29.2% during interval 2 (p=ns). Most ICU patients required IV infusion of a benzodiazepine for both intervals, and 53% received I/MV in interval 1 vs. 38.1% for interval 2 (p<0.05). Pneumonia among ICU patients was seen in 50.6% vs. 36.9% respectively (p<0.05). During both intervals, most patients with pneumonia required I/MV, and ICU and hospital LOS were similar. During interval 2, 62% of patients received infusions of dexmedetomidine or propofol together with infusion or bolus benzodiazepine dosing vs. 34% who were treated with a benzodiazepine as the sole sedation agent. This contrasts with 82% of patients who required a benzodiazepine infusion during the first interval. Thus, 64% of interval 2 patients received a different and combination sedation regimen.

Conclusion: From 2005 to 2010, sedation therapy evolved to use of multiple agents, although benzodiazepines remained initial therapy. The cohort of patients studied was nearly identical. During interval 2, nearly 2/3 of patients received combination therapy that usually included a benzodiazepine, supplemented with dexmedetomidine or propofol. The proportion of patients who required intubation/mechanical ventilation and the prevalence of pneumonia during the second interval was significantly lower. But we could not attribute this favorable trend to changes in sedation practice. The management of severe AWS remains challenging, and sedation management has yet to have a major impact on hospital course.
A RARE CASE OF PULMONARY ALVEOLAR PROTEINOSIS

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Introduction: Pulmonary alveolar proteinosis (PAP) or phospholipoproteinosis is a rare disorder characterized by progressive accumulation of surfactant within pulmonary alveoli. As accumulation occurs, it affects the lung diffusely, leading to respiratory insufficiency and failure. It classically has little or no lung inflammation and preserved underlying lung architecture. We present such a difficult case that was misdiagnosed as pneumonia with failed response to multiple attempted treatments.

Case: A 47 year old Hispanic female with no significant past medical history presents with complaints of two month history of productive cough with whitish sputum and gradually worsening shortness of breath. Initially, she had dyspnea with exertion which progressed to dyspnea with any activity or with speaking. At the onset of her symptoms, she was evaluated by her primary care provider with a chest x-ray, which showed diffuse bilateral lower lobe airspace opacities with reticular pulmonary interstitial prominence. She was treated as an outpatient with ceftriaxone and azithromycin for pneumonia. The patient was compliant with prescribed therapy but failed to have any improvement. Therefore, she returned four days later to the primary care provider, who changed therapy to amoxicillin/clavulanic acid and referred her to the pulmonology clinic for further investigation. In the pulmonology clinic, staff noted the patient to be in respiratory distress and oxygen saturation on pulse oximetry was 85%. The patient was immediately admitted to the hospital for stabilization and further evaluation. On admission, vital signs were within normal limits except oxygen saturation of 95% on two liters nasal cannula, which dropped down to 89% on ambient air. Physical exam noted no jugular venous distention, the chest was clear to auscultation including no abnormal heart sounds, and she had no peripheral edema. A complete blood count, complete metabolic panel, and echocardiogram were all found to be within normal limits. Arterial blood gas analysis showed an alveolar-arterial gradient of 40 mmHg. A computer tomography (CT) of the chest showed diffuse bilateral pulmonary septal thickening and superimposed ground-glass opacities spread evenly, labeled “crazy paving”. Further imaging, a high resolution CT chest, confirmed stable septal thickening with pleural sparing. Pulmonary function testing found a DLCO 22% of predicted, TLC 82% of predicted and a FVC 100% of predicted. Bronchoscopy was done and showed normal mucosa without signs of inflammation or infection. A bronchoalveolar lavage showed alveolar secretions described as slightly cloudy or “milky.” On pathologic examination, mucosa appeared normal, but a special stain for Periodic-acid Schiff was positive. No malignant cells were seen. An extensive infectious workup was negative including testing for coccidioidomycosis, tuberculosis and other acid fast bacilli, Nocardia, Pneumocystis (PJP), atypical fungi, pertussis, Mycoplasma, Legionella, and viruses, including Cytomegalovirus. The patient was finally diagnosed with PAP and transferred, on supplemental oxygen and antibiotic prophylaxis, to an outside facility for total lung lavage.

Discussion: In brief, PAP is either primary/congenital or acquired/secondary (usually after high level of dust exposure e.g. silica, aluminum). Though a clear pathophysiology eludes us despite half a century of research, granulocyte macrophage-colony stimulating factor has now been implicated, either through genetic deficiency in the cytokine or autoimmune antibody mediated destruction. Though many modalities have been attempted, the most consensus-approved treatment in symptomatic patients is whole lung lavage to remove extra surfactant and possible antibodies.
PRELIMINARY FINDINGS: USE OF MESENCHYMAL STEM CELL GRAFTS FOR COVERAGE OF DEEP PARTIAL THICKNESS WOUNDS

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Purpose: Partial thickness burns (PTBs) are often a challenge, since their natural progression often yields deeper wounds that require increased dressing changes, difficult pain control and operative intervention. In recent years, burn providers have employed hydro-surgery coupled with various methodologies as a means for “biologic coverage” of deep PTBs. Although very effective, this protocol often requires several procedures under sedation or anesthesia, leading to significant intervention and cost. Recently, a multipotent cellular repair matrix (MCRM) has been shown to have efficacy in the treatment of a variety of wound types, and the question arose of whether MCRM would be effective for treatment of deep PTBs.

Methods: Nine patients with deep PTB were identified as proper candidates for MCRM grafting after excision via hydro-surgery. Historical comparison was performed on 437 patients that underwent xenograft placement after hydro-surgery from January 2010 - December 2011. Data points examined age, gender, etiology of injury, total body surface area burn, number of operations, need for general anesthesia for removal of biological, length of stay and outcome.

Results: Of the 9 patients (8 adults, 1 pediatric; 89% male) that underwent MCRM grafting, average age was 19 years, length of stay (LOS) of 14 days, and TBSA of 12%, with 90% of the patients burned by flame. Patients treated with xenograft included 218 adult and 67 pediatric; average age was 31 years, 71% male, LOS of 17 days, and 10% TBSA burn from either a flame (32%) or scald (31%) most commonly. Of the MCRM patients, 89% (8 out of 9) required no further operative management; the 9th patient required reapplication of xenograft due to “limited” MCRM during the first operation. None of the MCRM patients required autograft placement. Seven of the MCRM patients were healed (100% re-epithelialization) within 7 days of placement. Patients who underwent xenograft had an average of 1.44 operations including 30% who also required autograft and 12.5% who needed general anesthesia for complete removal of their xenograft. Cost for a 100cm² piece of MCRM was $2,500 (US) compared to $25 (US) for xenograft.

Conclusions: Although preliminary and limited by the number of MCRM patients, initial results are very encouraging. MCRM provides fibroblasts and growth factors supporting migration, proliferation and differentiation for tissue regeneration. MCRM patients healed faster, required fewer operations and less exposure to general anesthesia. Even though MCRM has a 100x increase in cost, if patients only require a single operation which results in complete healing, patient satisfaction will be improved and a significant cost savings realized.
SYNOVIAL CELL SARCOMA: CASE REPORT

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Introduction: Synovial cell sarcoma is a rare mesenchymal malignancy that represents approximately 5-10% of all soft tissue sarcomas. Such tumors most often occur in the extremities of young adults, whereas only a few percent of these tumors are found in areas other than the extremities. Prognosis is worse when the tumor is more advanced or located more proximal on the body. The incidence of synovial cell sarcoma has been estimated to be 2.75 per 100,000. Approximately 800 new cases are reported in the United States yearly. Synovial cell sarcoma is the third most common soft tissue tumor in adolescent and young adults, and is the most common soft tissue tumor of the lower extremities. Histologically, the tumor is composed of fusiform cells characterized by spaces or clefts lined by cuboidal cells which histologically resemble a synovial cavity, despite no association with a true synovial membrane. The (X;18) (p11;q11) translocation fuses the SYT gene from chromosome 18 to either of 2 homologous genes at Xp11, either SSX1, SSX2, or SSX4. The fusion proteins SYT-SSX1 and SYT-SSX2 are believed to function as aberrant transcriptional regulators, resulting in either activation of proto-oncogenes or inhibition of tumor suppressor genes. A correlation appears to exist between the histologic subtype of the tumor and either of the 2 fusion proteins. Biphasic tumors contain both epithelial and spindle cell components. These tumors express the SYT-SSX1 transcript. Monophasic tumors, with only a spindle cell component, may express either transcript. We report a case of a 14-year-old female who presented with a chief complaint of LUQ abdominal pain along her anterior costal margin, which was found to be a monophasic synovial cell sarcoma.

Case report: Our patient is a 14-year-old female whom presented to the Pediatric surgery service as a referral for evaluation of a painful mass along her L subcostal margin/LUQ of her abdomen. She noticed a slow growing mass over the previous 3-4 months which had increasing pain. She reported pain upon inspiration and palpation of the area (pain out of proportion). Due to the pain, she was unable lie still to allow physical exam/palpation of the mass. An ultrasound was obtained showing a 3cm x 2.8cm hypoechoic, solid, vascular lesion in the right subcutaneous fat plane not associated with the underlying muscle at the site of the reported pain/mass. We offered surveillance with serial ultrasounds versus removal of the mass to determine pathology. Due to patient discomfort and anxiety about this small mass, her parents elected for resection and identification. At excisional biopsy, we encountered a mobile, solid, dark colored lesion ~3cm x 3cm in size associated with the underlying muscular fascia, which was resected en bloc with the surrounding subcutaneous tissue and a small section of underlying fascia. The tumor path came back as spindle cell, intermediate grade, monophasic synovial cell sarcoma with a t(X;18)(p11.2;q11.2), SYT and SSX translocation, which is positive in 80% of all synovial cell sarcomas. Several other nonspecific genetic abnormalities in the tumor tissue were identified. The deep margin was focally positive for tumor. Her family was notified and patient returned to the operating room for wide resection of the tumor site and reconstruction. Plastic surgery was consulted for the reconstruction. After the margin resection, we achieved negative margins on final pathology. At this time, the tumor stage was a T1B (intermediate grade, <5 cm). Pediatric oncology was also consulted and following the patient. No radiation/chemotherapy was recommended after the final resection margins were found to be negative for tumor. The patient was seen at her 6 month follow up; no pain or mass has returned at the site. A CT scan of the abdomen was obtained without definitive evidence for recurrence; we are awaiting results of an MRI to evaluate the site further.

Discussion: Synovial Cell Sarcoma, although rarely found in the soft tissues of the thorax, may present as a benign appearing, slow growing mass. Radiographic features are not consistent in smaller synovial cell sarcomas and have not been shown to differentiate between benign and malignant lesions. Surgical resection is the mainstay of treatment. Surgical resection with wide negative margins in a <5cm synovial cell sarcoma of the lower chest wall/ LUQ abdominal wall is reported. No additional treatment was recommended or initiated. Our patient is now 7 months from resection without recurrence and is actively being followed.
ANALYSIS OF LONG-TERM OUTCOMES IN SOMALI REFUGEE WOMEN RECEIVING AN EDUCATIONAL INTERVENTION ON BREAST HEALTH

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Purpose: Health literacy is “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.” Individuals with limited health literacy have difficulty navigating complex health systems. Somali refugees face additional challenges to assimilating to western healthcare. These include a strong oral culture, new written language, and large proportion of Somali refugees migrating from rural areas with limited healthcare. Preventative medicine is a difficult concept to grasp, as many believe disease is “sent from God.”

An educational intervention on breast health was implemented to Somali and Somali-Bantu refugee women. This was conducted by the Refugee Women’s Health Clinic (RWHC) in conjunction with the Susan G Komen foundation over a two-year period. The intervention consisted of an educational video on breast health in the Somali language, demonstration using breast models, and a PowerPoint presentation containing key facts on breast health and cancer surveillance. The purpose of this project was to evaluate the long-term benefits of an educational intervention on breast health.

Methods: This was a prospective observational cohort study with the administration of a survey to Somali and Somali-Bantu women in the Phoenix Metropolitan area. The control group, women who had not attended one of the educational interventions, was compared to the intervention group. Both knowledge and attitude (toward seeking preventative care) on breast health and cancer screening were assessed. Data was analyzed using a T-test and multivariate analysis.

Results: 99 surveys were collected; 27 in the intervention group and 58 in the control group (14 surveys could not be analyzed with respect to attendance of the intervention because of insufficient answers). The majority of participants were less than 50 years old (89.7%), originating from Somalia (97.9%), of Somali or Somali/Bantu descent (97.9%), with an educational background of primary school or less (73.7%). There was a statistically significant improvement in both breast health knowledge and attitude (p <0.05 for 82% of the 17 questions) among women who attended educational sessions.

Conclusion: The study results support the efficacy of this method of health education in Somali and Somali-Bantu refugee women. It also serves to support the expansion to other health topics and the entire Somali refugee population. The goal is to increase patient compliance, health awareness, and satisfaction in a population with poor health outcomes and a lack of trust in western healthcare.
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COST ANALYSIS OF PULMONARY EMBOLISM RULE-OUT CRITERIA (PERC) IMPLEMENTATION WITH PHYSICIAN-DIRECTED FEEDBACK IN TWO EMERGENCY DEPARTMENTS

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Purpose: To evaluate the cost effectiveness of encouraging the use of the Pulmonary Embolism Rule-out Criteria (PERC) in the emergency department in patients with a low probability of having a pulmonary embolism.

Methods: This study was a retrospective, observational study conducted at two urban emergency departments in Phoenix, AZ: Banner Good Samaritan Medical Center (BGSMC) and Banner Estrella Medical Center (BEMC). The medical director for both emergency departments began encouraging the use of PERC criteria for patients with a low probability of having a pulmonary embolism in January 2011 by sending out a generic, automated e-mail to those providers ordering over 8 CTA Chest (Computed tomographic angiography Chest) per month. The total number of CTA chest both before and after PERC encouragement were tabulated. A cost analysis was conducted using the estimated hospital reimbursement for the CTA chest at each institution. Average cost of a CTA chest was approximately $5,000.

Results: The total number of CTA chest ordered at BGSMC emergency department dropped from 995 in 2010, to 727 in 2011 and 651 in 2012. The number of CTA chest ordered per 1,000 patients seen in the emergency department dropped from 16 in 2010 to 11.8 in 2011 and 10.5 in 2012. The total number of CTA chest avoided in the BGSMC emergency department per year was 153 resulting in an estimated cost savings of $1,530,000/year for two years. The total number of CTA chest ordered at BEMC emergency department dropped from 1945 in 2009 and 1776 in 2010, to 1150 in 2011 and 1168 in 2012. The number of CTA chest ordered per 1,000 patients seen in the emergency department dropped from 23.4 in 2009 and 20.9 in 2010, to 12.8 in 2011 and 12.1 in 2012. The total number of CTA chest avoided in the emergency department per year was 349 totaling a total savings of $3,485,000/year for two years.

Conclusions: Institutional implementation of a clinical prediction tool into the decision-making process is feasible and significantly reduces the number of CTPAs being performed, with substantial cost savings and patient benefits.
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RISK FACTORS ASSOCIATED WITH SHORT INTER-PREGNANCY INTERVAL

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Purpose: A short inter-pregnancy interval (IPI) has been associated with adverse pregnancy outcomes, including preterm birth, small for gestational age, stillbirth, neonatal death and uterine rupture during trial of labor. As there are multiple deleterious effects of a short inter-pregnancy interval, it would be helpful to be able to identify these patients prior to conception and modify risk factors if possible. The aim of this study was to identify risk factors associated with a short-interval pregnancy.

Methods: Data was gathered for a retrospective case-control analysis by reviewing the delivery logs at Maricopa Medical Center (MMC) from 2011-2012. Patients were eligible if they had also delivered their prior pregnancy at MMC, and if both pregnancies were singleton pregnancies with delivery at 20 weeks or greater. Women with inter-pregnancy intervals of greater than 5 years were excluded from the study. Pregnancy interval was obtained by calculating the number of days between the LMP date for the index pregnancy and the date of delivery of the prior pregnancy. Eligible patients were separated into either normal IPI (1-5 years) or short IPI (less than 1 year). Demographic data and information on the prior pregnancy was then obtained by reviewing hospital charts and clinic records. Variables assessed were age, ethnicity, primary language, employment status, marital status, level of education, type of insurance, delivery mode, outcome of delivery, number of prenatal visits attended, planned breastfeeding, type of planned contraceptive, length of stay postpartum and participation in postpartum visit. Associations between predictor variables were examined using univariate analysis, with calculation of odds ratios and a 95% confidence interval. Variables were also examined using linear regression, with inter-pregnancy interval as a continuous variable in order to identify possible independent predictors of pregnancy interval.

Results: A total of 305 women were identified as eligible candidates for this study, 247 women with a normal IPI and 58 with a short IPI. These women were predominantly Hispanic (92%) and the main payer source was AHCCCS or FES (92%). No statistically significant variables or demographics were identified with the univariate analysis as being associated with a short-inter pregnancy interval. Some factors showed possible trends toward association, such as education level, 9.67 years with normal IPI and 8.73 years with short IPI, and employment status 16% employed for normal IPI and 8% employed with short IPI, but both were still not statistically significant (p value .089, and .197 respectively). Linear regression analysis of factors such as gestational age at delivery, number of prenatal visits, length of hospital stay, breastfeeding, intended method of contraception and participation in postpartum visit still did not reveal any significant associations with pregnancy interval.

Conclusion: No statistically significant risk factor was found that was associated with a short inter-pregnancy interval. There may be many reasons for these results, including not one, but a multitude of factors that pre-dispose a woman to a short inter-pregnancy interval. A higher-powered study may have also found differences in areas where there appeared to be a trend like level of education and employment status. The study’s design being retrospective and a chart review also limited what risk factors could be examined. A future study might involve an interview or survey of patients when they presented to the hospital for delivery. This would allow for assessment of planned versus unplanned pregnancy, actual contraceptive being used if any, and if the patient had ever had any education on healthy pregnancy interval.
INTERRACRANIAL PRIMARY RHABDOMYOSARCOMA OF PINEAL GLAND: A CASE REPORT

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Introduction: Primary intracranial rhabdomyosarcoma (RMS) is extremely rare in adults, with only 22 previously documented cases. Rhabdomyosarcomas are predominantly a pediatric tumor, and even in the pediatric age group, rarely presents primarily intracranial. We present the first case of primary pure pineal gland RMS in an adult with a review of literature.

Case Report: A 43-year old female presented with a one month history of ataxia and frequent falls. Work up revealed a pineal region mass that was resected. The final pathology confirmed a primary RMS. While awaiting adjunctive therapy, the woman suffered a complicated clinical course. She developed hydrocephalus, necessitating bilateral ventriculo-peritoneal shunt placement. Repeat imaging also revealed rapid local recurrence of tumor at the prior resection site. Two months after the index resection, a final attempt at repeat resection was made. Unfortunately, the patient did not show any response to this and died within four months of initial diagnosis.

Discussion: Primary intracranial sarcomas represent only 0.9%-3.0% of all intracranial tumors. Tumors of pineal origin are commonly teratomas or germinomas. This is the first reported case of primary pineal gland RMS in an adult with two prior reports of pineal RMS arising in pineal teratomas. There are 23 reported adult cases (including our patient) with primary intracranial RMS. Ages range from 18-68 years with equal sex distribution. Common intracranial locations of RMS include frontal, parietal and cerebellar regions. Diagnosis involves exclusion of metastatic disease from extra-cranial source with whole body imaging. A specific immunohistochemical pattern of positive desmin and negative non-mesenchymal cell type markers (e.g. synaptophysin, cytokeratin, or neuron specific enolase) is diagnostic of RMS. Craniospinal irradiation and intrathecal methotrexate have now been replaced by attempted total tumor resection, followed by whole brain radiation (dosage 50-60 Gy) and chemotherapy (VAC regimen: vincristine, actinomycin D and cyclophosphamide). Reported survivals range from < 1 month to 30 months post diagnosis. Eleven of the 23 reported patients were known to have a local recurrence at the site of original tumor, as was seen in our case. Primary intracranial RMS offers a short, aggressive clinical course in adults, often with rapidly progressive local recurrence of tumor. In view of the paucity of literature, it is hard to make standard recommendations about the treatment of adults with primary intracranial RMS, and hence they should be treated as per pediatric protocols.
**THE BLUE MAN: BURNS FROM MURIATIC ACID COMBINED WITH CHLORINATED PAINT IN AN ADULT POOL CONSTRUCTION WORKER**

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**Introduction:** Muriatic acid (hydrochloric acid), a caustic agent, is often used for cleaning and resurfacing concrete pools. After this initial cleaning agent is used, the pools are then coated by a rubber-based chlorinated paint. When contact exposure occurs, significant burn injuries occur, with even a brief exposure. The resultant chemical injury to the skin and underlying tissue is directly related to the time of exposure and ultimately, the ability to normalize the skin’s pH.

**Case Report:** A 50-year-old Hispanic male experienced significant contact exposure to a combination of muriatic acid and blue-colored chlorinated rubber-based paint while working as a pool worker during the process of a pool resurfacing. He arrived to the Arizona Burn Center with stable vital signs, but was covered in blue paint, beneath which was muriatic acid covering his skin and causing ongoing damage. Confounding the situation was the inability to efficiently remove the acid secondary to the rubber-based nature of the overlying paint. There was also a strong presence of ongoing fumes that began affecting the burn team. A variety of agents were used in attempt at removing the rubber paint, including bacitracin, chlorhexidine soap, GOOP, and Johnson’s Baby Oil. We found that the most effective agent was bacitracin, yet his exposure was already quite significant.

Resultant injuries were devastating fourth degree burns requiring immediate operation. The operative excision included removal of skin, subcutaneous tissue, fat, and in some areas, muscle. Additionally, he required an amputation, yet despite these very aggressive measures, he developed worsening acidosis and hemodynamic instability. His resuscitation and operative debridement was significantly hampered by the extremely pungent odor coming from his body. He was ultimately brought to the intensive care unit for ongoing aggressive resuscitation. He continued to have severe metabolic derangements refractory to all interventions, and ultimately succumbed to his injuries.

**Discussion:** When faced with a chemical injury, the most important treatment is prompt removal of the offending agent. During the initial attempts at removal of the rubber based paint, we did discover that the most effective agent available was bacitracin. Noxious fumes are known to overcome people who work with potent chemicals, but these same odors can also hinder the health care team, and appropriate precautions must be undertaken. Aggressive operative debridement and excision to remove the offending agent should be carried out as soon as possible, in conjunction with diligent resuscitation and correction of metabolic derangements.
CLASSICAL PRESENTATION OF ACUTE BACTERIAL ENDOCARDITIS IN MODERN TIMES

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Introduction: Acute bacterial endocarditis is associated with numerous phenomena, including vascular and autoimmune phenomena, bacteremia, and valvulopathy. Originally described in 1885 by Sir William Osler, acute bacterial endocarditis remains a common and life-threatening disease.

Case Report: A 21-year-old female with past medical history significant for recreational injection drug use, chronic hepatitis C infection, valvular heart disease, and two prior episodes of infectious endocarditis presented to the emergency department with complaints of fever, nausea, headache, and painful purple lesions on her fingers and toes. On physical exam, she was noted to be febrile and tachycardic. She had a grade 4/6 holosystolic murmur radiating to the left axilla. Numerous tender violaceous lesions were noted on her fingers and toes—consistent with finding of Osler’s nodes. Admission labs showed leukocytosis and bacteremia. Lumbar puncture was notable for numerous RBCs and WBCs—initially interpreted as a traumatic tap. Chest CT showed bilateral pulmonary emboli and trans-esophageal echocardiogram revealed perforated mitral valve with severe mitral valve regurgitation, patent foramen ovale, and mitral and tricuspid vegetations. She was admitted to critical care for management of sepsis secondary to acute bacterial endocarditis. Ophthalmology noted Roth’s spots on slit lamp exam. Her headache, which was initially thought to be related to the lumbar puncture, did not improve. After several days, her neurological examination revealed anisocoria—right greater than left—and left sided motor weakness suggesting intra-cranial pathology. Cerebral angiogram was performed which showed a mycotic aneurysm with small parietal and basal ganglia intraparenchymal hemorrhages, secondary to septic emboli. Craniotomy and coiling of the aneurysm was performed by neurosurgery. Her neurological deficits gradually improved. She was eventually transferred to an outside hospital for valvuloplasty for treatment of severe valvular heart disease.

Discussion: The above patient was positive for two major and four minor Duke’s Criteria. In patients presenting with acute bacterial endocarditis, there is no substitute for a detailed history and physical exam; but it is equally important to ensure appropriate ancillary testing to confirm the diagnosis and guide management. In the above example, cultures were drawn prior to initiation of antimicrobial therapy, eventually revealing infection with MSSA, and echocardiography was performed. The results of her lumbar puncture should have raised suspicion for a mycotic aneurysm, but it was not discovered until focal neurological signs developed. Due to the unpredictability and high potential for morbidity and mortality, a high index of suspicion for mycotic aneurysm must be present in cases of acute bacterial endocarditis.
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PULMONARY HEMORRHAGE IN PRIMARY BILIARY CIRRHOSIS: A CASE REPORT

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Introduction: Primary biliary cirrhosis (PBC) is a chronic cholestatic liver disease with a probable autoimmune pathogenesis, predominantly affecting middle aged and elderly women. The occurrence of immune-mediated damage, such as vasculitis in patients with primary biliary cirrhosis, has rarely been described. We describe a woman with primary biliary cirrhosis presenting with a rare manifestation of pulmonary hemorrhage. It suggests possible association between vasculitis and primary biliary cirrhosis. In a systemic review of the literature, this is the third reported case of pulmonary hemorrhage in patients with underlying primary biliary cirrhosis.

Case Report: A 48-year-old female with history of primary biliary cirrhosis and hypothyroidism presented with hemoptysis for one week. Her physical examination was significant for jaundice, dyspnea with bilateral scattered rales, and spider angiomata on anterior chest. Hepatosplenomegaly was not appreciated on abdominal exam. She was treated for right lower lobe pneumonia at outside facility one week prior to admission. Patient also received two units of packed red blood cell transfusion before admission for microcytic anemia with hemoglobin of 8.2 g/dL. She was found to have elevation of liver enzymes: alkaline phosphatase 1357 (normal: 38 to 126 U/L), gamma-glutamyl transpeptidase 1235 (normal: 0 to 30 IU/L), aspartate transaminase 112 (normal: 14 to 36 U/L), alanine transaminase 56 (normal: 9 to 52 U/L), and total serum bilirubin 4.0 (normal: 0.2 to 1.3 mg/dL). The platelet count was 240 K/uL (normal: 140 to 440 K/uL), and the coagulation profile was normal. The antimitochondrial antibody (AMA) was positive with a titer of 1: 640 (normal: < 1:20), and antinuclear antibody (ANA) was positive, but anti-smooth muscle antibody, antineutrophil cytoplasmic antibody (ANCA), rheumatoid factor, SSA, SSB, myeloperoxidase antibodies, serine protease 3 antibodies, anti-glomerular basement membrane antibody, cryoglobulin and antiphospholipid panel were all negative. She had elevated C-reactive protein (CRP) 25.6 (normal: 0 to 3.0 mg/L) and sedimentation rate (ESR) 45 (normal: 0-20.0 mm/hour). She was also negative for HIV, Coccidioides, hepatitis A, B, and C infections. Bacterial cultures of sputum and blood samples were not rewarding. A chest x-ray examination revealed bilateral diffuse air space opacities. Although she had proteinuria detected with 261 mg/24 hr (normal: 42 to 225 mg/24 hr), her renal function was normal. Bronchoscopy revealed diffuse alveolar hemorrhage suggesting pulmonary capillaritis. A liver biopsy showed a mild to moderate increase in lymphohistiocytic inflammation in portal tracts, suggesting bile ductopenia which was consistent with primary biliary cirrhosis, stage 1 (of 4). Diagnosis of primary biliary cirrhosis and presumptive vasculitis was made and therapy with ursodeoxycholic acid and methylprednisolone intravenously 60 mg/day was started, then prednison orally 60 mg/day was continued. Her hemoptysis resolved and liver laboratory abnormalities improved after steroid therapy was initiated.

Discussion: Pulmonary hemorrhage is very rare in primary biliary cirrhosis. Pulmonary involvement (mainly bronchial asthma, emphysema, and decreased diffusion capacity) is present in up to 56 percent of patients with primary biliary cirrhosis. Primary biliary cirrhosis has been previously reported associated with vasculitides. This case report raises the possibility of an association between primary biliary cirrhosis and vasculitis. We conclude from this case that in patients with primary biliary cirrhosis, who present with rare life-threatening pulmonary hemorrhage, vasculitis should be considered in the differential diagnosis after infectious causes and systemic rheumatic diseases are ruled out.
PREDICTING RESTRAINTS IN CHILDREN AND ADOLESCENTS AT A RESIDENTIAL TREATMENT FACILITY: A RETROSPECTIVE CHART REVIEW

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Purpose: Seclusions and restraints (also known as “therapeutic holds”) are an intervention in psychiatric settings meant to redirect behavior. In the literature, these interventions have been described as potentially both therapeutic and traumatic, and are often the topic of study in attempts to decrease frequency. Seclusion and restraint, like any intervention, have risks, including physical injury. In some extreme cases, death has resulted from use of restraint. The purpose of this study was to examine the correlation between psychiatric diagnoses and the likelihood of requiring a seclusion or restraint while being treated in a residential treatment facility. It was hypothesized that the strongest correlation would occur in patients diagnosed with Posttraumatic Stress Disorder (PTSD), due to psychological reoccurrence of traumatic events during their stay, which may lead to irritability or outbursts of anger.

Methods: A retrospective chart review was performed of 50 child/adolescent patients admitted to a residential treatment center who required use of restraints during their stay. “Restraint” was defined as any occurrence of a staff member putting hands on a patient to redirect behavior. These incidents were documented in the patient’s chart using a specific form. Additional data collected from charts included the patient’s diagnoses at discharge and the number of restraints required throughout the patient’s hospitalization. We focused on the number of restraints for the five most frequently occurring diagnoses, and analyzed the data using Poisson regression, statistically adjusting for co-occurring diagnoses.

Results: We used our model to predict hold rate based on diagnosis. The five predictors in our model were: Bipolar Disorder NOS, Bipolar Disorder most recent episode manic, Bipolar Disorder most recent episode mixed, PTSD, and Attention Deficit/Hyperactivity Disorder (ADHD). Contrary to our original hypothesis, ADHD was the only reliable predictor (β = .68, 95% CI [.50, .86], p = .04), with a rate ratio showing that the estimated hold rate of ADHD patients was approximately twice that of non-ADHD patients (1.97, 95% CI [1.65, 2.36]), controlling for all other predictors in the model.

Conclusion: Patients diagnosed with ADHD were twice as likely to be placed in restraints as were patients with any other diagnosis. This finding was not unexpected, given the pathophysiology of the disease. Children with ADHD often have functional differences in the prefrontal cortex, which is the brain area thought to be primarily responsible for executive functioning, impulse control, and consideration of future consequences. In a residential treatment facility, there is a low threshold for disruptive behaviors, and children with ADHD often struggle to contain the irritable behaviors. This information will be useful in formulating treatment plans to minimize the number of restraints required and to decrease the risk of adverse events among children diagnosed with ADHD.
Abstract 93

SERUM PROTEIN AUTO-ANTIBODY BIOMARKER PANEL MAY IDENTIFY LUNG CANCER AMONG NON-CALCIFIED NODULES INCLUDING SOLID NODULES AND GROUND GLASS OPACITIES IDENTIFIED THROUGH PROSPECTIVE CT-SCAN SCREENING OF A HIGH-RISK COHORT.

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Purpose: Non-small cell lung cancer (NSCLC) accounts for >80% of all lung cancer cases in the United States with a poor 5-year survival rate of 15%. Although the most effective treatment for NSCLC remains surgical resection, the majority of patients present at late stage with unresectable, advanced or metastatic cancers that preclude surgery. Computed tomography (CT) screening which can detect lung cancer in early stage with an estimated 10-year survival rate >80% has poor specificity because of the high prevalence of non-calcified and ground glass pulmonary nodules which may be due to slowly resolving inflammatory, granulomatous and fibrotic diseases, or atypical adenomatous hyperplasia (AAH), bronchoalveolar carcinoma (BAC, also termed adenocarcinoma-in-situ), and adenocarcinoma. Non-calcified nodules (NCNs) include ground-glass opacities (GGOs) and solid nodules (SNs). Larger size (>10 mm) and a history of lung cancer are risk factors for NCN growth. About 75% of persistent nodules are BAC or adenocarcinoma with predominant BAC component but these nodules do not manifest morphologic features that distinguish them from non-malignant NCNs. AAH is regarded as a potential precursor lesion of BAC and adenocarcinoma and may appear as NCNs on CT scans. The challenge is to identify easily accessible biomarkers with high specificity and sensitivity to help distinguish NCNs that progress to cancer from inflammatory etiologies of CT abnormalities.

AIMS: Discovery and verification of autoantibodies in serum for lung cancer screening. Validation of candidate antigens of the lung cancer autoantibody biomarker panel. Develop statistical prediction models for early detection of lung cancer based on a panel of autoantibody biomarkers compared to smoking habit, benign solid nodules and/or emphysema in high-risk cohorts. Validate the statistical prediction models for early detection of lung cancer based on panels of autoantibody biomarkers.

Technique: Nucleic Acid Programmable Protein Array (NAPPA)
The unique protein microarray technology, NAPPA, developed in the lab of Dr. Joshua LaBaer entails programming cell free protein expression extracts with cDNAs to express the proteins at the time of the assay.

Methods: We screened sera from 40 lung adenocarcinoma cases and 40 controls matched for age, gender and smoking against 10,000 human genes on NAPPA arrays from Joshua LaBaer Laboratory to eliminate >90% uninformative antigens and select 750 most probable antigens. We are going to screen sera from 100 lung adenocarcinoma, 50 lung granulomas or fibrosis, 100 benign non-calcified nodules and 50 emphysema subjects (followed in a lung cancer CT-scan screening trial) against the selected 750 antigens on the NAPPA array (estimated completion in April 2013). We will be processing the data to select the 30 most probable antigens which could be used as biomarkers in early diagnosis of Lung Cancer (May 2013). The next step involves validation the 30 candidate antigens of a lung cancer autoantibody biomarker panel using Enzyme-Linked Immunosorbent assay (ELISA) or Luciferase Immunoprecipitation systems assay (LIPS assay) using the same sera as in the last step of the discovery phase and then validate the statistical prediction models for early detection of lung cancer based on panels of autoantibody biomarkers (Estimated completion June 2013).

Results: Awaiting results.
CHARACTERISTICS OF DOG BITE INJURIES PRESENTING TO AN URBAN PEDIATRIC TRAUMA CENTER

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Background: Dog bites are commonly seen in the emergency department. Currently, the annual mortality for dog bites in the United States is reported at 7.1/100 million with nearly 60% of the deaths occur in children less than 10 years of age. Children are at higher risk, 1.3/1000 population, for dog bite injuries due to their smaller size and physical vulnerability. Behavior is another potential contributory factor as children often lack the maturity to assess canine behavior thereby increasing their risk of attack.

Objectives: There are both human and dog factors involved in each bite circumstance. The objective of this study was to describe the circumstances involved in the dog bite injury in a series of pediatric patients who presented to an urban tertiary care pediatric ED.

Methods: Retrospective chart review study of children presenting to a free standing children’s hospital emergency department with a dog bite. The study period was from 2003 to 2006. Data collected included patient demographics, characteristics of the bite incident including familiarity with the dog, location where the bite occurred, whether bite was provoked, type of injury (laceration, abrasion, and puncture), dog breed, and dog bite setting.

Results: There were 221 dog bites seen during the study period. The average age of the children was 6.0 ± 3.9 years. Children < 9 years comprised 82.8% of the study group (< 4 years of age comprised 51.6%). Lacerations, punctures, and abrasions comprised 57%, 21%, and 23% of the subset respectively. The bite occurred in either the patients home or in the home of someone known to the child in 61.5% of the cases. The dog was known to the child in 58.4% of cases and 45.7% of bites were reported as provoked. There were over 25 different dog breeds identified but pit bulls accounted for the most bites at 10.8%. Bites were most commonly located on the face and least commonly on the trunk. A face or scalp injury was nearly 8 times more common in children aged 0-4 than older children aged 10-14, and about twice as common as children aged 5-9 (χ²=34.11; p<0.001). Children 5 years and older comprised 63.2% (n=60) of extremity injuries and were twice more likely to sustain an injury to the extremities than children 4 years and younger (n=35). Bites that included multiple body regions accounted for 8.1% of the cohort (n=18).

Conclusions: Dog bites are more common in younger children seeking attention in the emergency department. The face was the most commonly bitten body location in this group. Bites tend to occur in a home or in the home of someone known by a dog known to the family. Therefore, prevention efforts should be aimed at dog owners whose animals will be exposed to children. Families with dogs require awareness on dog bite prevention knowledge.
UTILITY OF C-REACTIVE PROTEIN AND LEUKOCYTE COUNT IN REDUCING DIAGNOSTIC IMAGING IN THE SETTING OF SUSPECTED PEDIATRIC APPENDICITIS
IRB 12-071

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Purpose: Acute appendicitis is the most common disorder requiring abdominal surgery in children two years and older. Despite an increase in the use of ultrasound (US) and computerized tomography (CT), there has been no improvement in negative appendectomy rates. This imaging comes at substantial cost, and for CT, ionizing radiation exposure. Although, several studies have demonstrated the utility of combining C-reactive protein (CRP) and white blood cell count (WBC) to aid in the diagnosis of appendicitis the authors are unaware of any study that utilizes these inflammatory markers to obviate the need for imaging. The purpose of this study is to determine if forgoing diagnostic imaging in the setting of non-elevated WBC and CRP is prudent in patients with concern for appendicitis.

Methods: A retrospective observational study completed at an urban tertiary academic pediatric emergency department (PED). Patients were included in the study if they presented to the PED from January 2010 to April 2012, had a CRP and WBC obtained, a CT or US performed, and where the chart indicated a clinical suspicion for acute appendicitis. Based on results patients were split into four groups as detailed in the next section.

Results: 610 eligible patient encounters were identified aged 4 months to 18 years. 52% were female. 244 (40%) had low CRP and WBC values and did not have appendicitis. 239 (39%) had one or both of the lab values elevated and did not have appendicitis. 117 (19%) had elevated labs and confirmed appendicitis. 10 (1.6%) had low lab values and confirmed appendicitis. The negative predictive value of WBC, CRP, and combined values was 90.5%, 90.9%, and 96.1% respectively. If one had forgone imaging on patients with both low CRP and WBC, 173 CT (36%) scans and 119 US (42%) could have been avoided, but 10 cases (7.9%) of appendicitis would have been “missed”. Of note, all “missed” cases had mild non-perforated pathology.

Conclusions: A possible method to reduce diagnostic imaging studies for acute appendicitis is to forego imaging in patients with a CRP less than 1.0 and WBC less than 12.5. In our cohort this would have reduced the number of imaging studies more than 30% however, up to 8% of early cases of appendicitis would have been missed. A future prospective study is warranted to determine the effectiveness of this method in combination with close clinical follow-up in low risk patients.
Abstract 96

**EFFICACY OF 50% LOWER DOSAGE FOR FDG PEDIATRIC BRAIN PET-CT**

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**Purpose:** The purpose of this study was to evaluate if current dosage guidelines for PET-CT heads could be reduced by approximately 50% and maintain diagnostic image quality utilizing the same acquisition protocols with a lower dose of FDG.

**Materials and methods:** Current guidelines for pediatric head PET-CT are 0.1mCi/kg (3.7 MBq/kg, Treves 2011). This study expands on a prior small cohort description of lower doses (0.075mCi/kg) (Miller IPR 2011) in the pediatric population. 112 pediatric patients who underwent MRI brain and head PET-CT performed with a FDG dose of 0.075mCi/kg or less were reviewed. Those patients without a discrete lesion on MRI or either tissue diagnosis of a primary tumor or imaging follow-up of greater than 3 months were not included. This excluded 29 patients.

**Results:** 112 patients from 2 months - 21 years were evaluated. The weight based dose ranged from 0.037 to 0.075 mCi/kg (2.59-1.29 MBq/kg). Of these 111 of the 112 had FDG metabolism which either: 1) Delineated a suspected lesion/abnormality seen on prior MRI (hypermetabolism for high grade tumors or hypometabolism for cortical dysplasia, or 2) Did not display hypermetabolism in either low grade tumors or abnormalities which were not areas of high grade tumor recurrence. Of note, in regards to limitations, the minimum total dose of 1mCi results in a larger proportional dose in smaller patients.

**Conclusion:** Dosages of 0.075-0.037 mCi/kg (2.59-1.29 MBq/kg) provide diagnostic quality PET-CT images and reduce overall radiation by approximately 25-63% of the current recommended dosage guidelines.
Bone Scintigraphic Findings in MRSA Osteomyelitis

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Introduction: *Staphylococcus aureus* remains the most common etiologic agent of acute osteomyelitis in children. Recently, methicillin-resistant *S. aureus* (MRSA) has emerged as a major pathogen. MRSA leads to more aggressive cases of osteomyelitis. MRSA is proven to cause severe, life-threatening and limb-threatening disease in normal, healthy children. The manifestations are associated with minor local trauma. More than half the cases occur before 5 years of age, and it appears to be more frequent in male children. 15% of children with acute osteomyelitis caused by MRSA have multiple sites of infection. In addition abscesses and extraosseous involvement are commonly seen. Patients with bacteremia and multiple sites of osteomyelitis become severely ill and require admission to the pediatric intensive care unit, mostly because of pulmonary involvement and vascular complications, such as deep venous thrombosis and septic pulmonary emboli.

Whole body bone scintigraphy utilizing soft-tissue and delayed phases shows a characteristic pattern of multifocal involvement. It is important to recognize MRSA infection on bone scintigraphy so that complete and proper medical and surgical medical therapy can be instituted. Some characteristic scintigraphic patterns for MRSA osteomyelitis have emerged. MRSA affects long segments of bone including epiphysis, metaphysis, and diaphysis. Soft tissue imaging often demonstrates the involvement of the extraosseous sites. The acute lesions are frequent photopenic because of pressure on vascular supply by the purulent material and intraosseous abscess formation. Common staphylococcal osteomyelitis is usually geographic involving one epiphysis, metaphysis, or diaphysis. MR imaging is very sensitive for extraosseous findings in MRSA osteomyelitis and when osteomyelitis is suggestive of MRSA osteomyelitis should be utilized to better define these processes.

Case report: The study group included 5 patients. The clinical presentations included limp and/or pain. Two patients had involvement of an extremity, two had disseminated disease and one had involvement of the hip. All patients underwent three-phase bone scan and Gadolinium enhanced MRI. In patients with multifocal disease the diagnosis was suspected by bone scan. Bone scan showed long segment and multifocal involvement in 3 of 5 patients with areas of abnormal increased and decreased uptake. In one patient, the disease was localized in the hip and in another patient the involvement was limited to the tibia. Patients with more localized disease also demonstrate a heterogeneous pattern of increased and decreased uptake within the area involved. Joint involvement was seen in 4 cases.

Bone scan abnormalities correlated well with MRI findings of severe and extensive bone disease, abscess formation, muscle, joint and soft tissue involvement.

Discussion: Community acquired MRSA osteomyelitis is a severe form of infection characterized by multifocal osseous involvement and abscess formation with increased frequency of extraosseous complications including pyomyositis and septic arthritis. Bone scan findings in our patients correlate well with MRI and were useful for assessment of multifocal disease and follow-up treatment.
POIKILODERMA WITH NEUTROPENIA AND CALCINOSIS CUTIS IN A 7-YEAR-OLD FEMALE: AN UNCOMMON PRESENTATION OF A RARE DISEASE

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Introduction: Poikiloderma with Neutropenia is a rare genetic condition that usually presents with characteristic cutaneous findings of photosensitivity, hyperpigmentation, hypopigmentation and abnormal nails. Patients also have recurrent infections due to their constant neutropenia. We are reporting on an unusual presentation of Poikiloderma with Neutropenia with diffuse calcinosis cutis in a young Native American female.

Case Report: A 7-year-old Apache female presented to clinic with a non-healing wound on the leg and skin discoloration. The patient had a history of recurrent infections, poor dentition, photosensitivity and dry skin. She developed a “rash” at 4 months of age that progressed to involve her entire body, worsened by sun exposure. During her first year of life she developed several skin infections, non-healing wounds and pneumonias requiring hospitalization. Examination revealed a Native American girl of short stature with diffuse cutaneous hyper- and hypopigmented patches with telangiectasias. Hyperkeratosis was noted on the palms/soles. All nails were thick and brown. On her left lower leg there was a 3cm pink, bound-down plaque with a 2cm ulcer with yellow, keratotic debris. On her right distal leg and bilateral thighs there were several tender, bound down, atrophic plaques with overlying telangiectasias. Mild muscle weakness and atrophy in her extremities with normal range of motion was noted. Oral exam revealed metal caps over her incisors and molars as well as a few natal teeth. Skin biopsies, tissue culture and hospital admission ensued due to concern for skin infection, muscle weakness, and morphea-like skin changes. Biopsy of an indurated morphea-like plaque showed calcinosis cutis, a dense, fibrotic dermal stroma and lack of adenexal structures. Significant lab abnormalities included pancytopenia and elevated lactate dehydrogenase, aspartate aminotransferase, and creatinine kinase. Bone marrow biopsy showed dyserythropoiesis and MRI showed no evidence of myositis. X-rays of the lower extremities showed soft tissue calcifications. Tissue culture from the ulcer on the left leg was positive for Klebsiella, Group A Beta Streptococcus and Enterococcus. The patient was treated with IV antibiotics, started on IVIG and alendronate for the diffuse calcinosis, and Neupogen for neutropenia. Wound care consisted of Mepilex dressings and compounded topical sodium thiosulfate 25% to areas of calcinosis cutis twice daily.

Discussion: Poikiloderma with Neutopenia (PN), also known as Clericuzio-type poikiloderma, is a rare autosomal recessive condition characterized by noncyclical neutropenia, poikiloderma, dystrophic nails and recurrent infections. PN was initially described in 14 Navajo Native Americans by Clericuzio et al. There have been over 35 cases reported in both Native Americans and Europeans. Genetic analysis often shows a mutation in C16orf57 gene. Our patient was positive for a mutation on both alleles of the C16orf57 gene. She also had diffuse calcinosis cutis resulting in non-healing ulcers and morphea-like skin changes, findings not previously reported in the literature. The first case of biopsy proven calcinosis cutis was recently reported, and a few previous clinical descriptions of patients with calcified “cysts” exist. The cause of the calcinosis is unclear as serum calcium, vitamin D and parathyroid hormone levels are often normal. Our case brings to light the many features of this rare, distinct genetic disorder with significant skin involvement and the new finding of calcinosis cutis which presents a treatment conundrum.
Abstract 99

The Quality of Life of Adults with Attention Deficit Hyperactivity Disorder
A Systematic Review

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Objective: Across all medical specialties, quality of life has become an important measure of outcomes in both research and clinical settings. However, to date, there has not been a systematic review of the research relevant to quality of life in populations with adult attention deficit hyperactivity disorder. We approach quality of life in adult attention deficit hyperactivity disorder by answering the following questions: 1) What specific metrics are used to assess quality of life in adult attention deficit hyperactivity disorder? 2) What is the impact of adult attention deficit hyperactivity disorder on quality of life? 3) What effects do attention deficit hyperactivity disorder treatments have on quality of life? Searches of major electronic databases were conducted, and reference lists from the identified articles were searched for additional studies, with a focus on studies that utilized quality of life measures.

Design: Thirty-six relevant studies are included in our review.

Results: There are multiple unique measures currently used to measure quality of life in adult attention deficit hyperactivity disorder, ranging from general quality of life scales to those specifically designed for use in attention deficit hyperactivity disorder. Attention deficit hyperactivity disorder was found to significantly worsen the quality of life in adults. Treatment with atomoxetine and mixed amphetamine salts has shown beneficial effects on quality of life even in cases without symptomatology improvement.

Conclusion: Pharmacological treatment and early diagnosis have a positive impact on outcomes, longterm prognosis, and quality of life in adults with attention deficit hyperactivity disorder. Having multiple unique measures of quality of life have limited the direct comparison of different classes of attention deficit hyperactivity disorder medication treatments and future research should be aimed to address this.