SELECTED ABSTRACTS PAPERS

BASIC SCIENCE RESEARCH

Real-time Quantification of Renal Ischemia Using In Vivo Expression of P-selectin. Sero Andonian MD, Tonya Coulthard MSc, Arthur Smith MD, Pravin S. Singhal MD, Benjamin R. Lee MD; Department of Urology, Long Island Jewish Medical Center Introduction: During partial nephrectomy the renal hilum is clamped to safely resect renal masses. This results in ischemiareperfusion injury (IRI), marked by endothelial expression of P-selectin, which attracts neutrophils. The purpose of this pilot study was to quantitate the microvascular perfusion and in vivo expression of P-selectin as a marker of IRI. Materials and Methods: After approval of the IACUC, ten C57/BL6J female mice were evaluated. The left renal artery and vein were ligated for 30 minutes. Pulse-Wave Doppler was performed to measure renal arterial blood flow. Vevo 770 (VisualSonics, Toronto, Canada), with a resolution of 40µm was used to non-invasively measure the microvascular flow and to quantitate targeted microbubbles. Microbubbles are fluorocarbon filled lipid shells that vibrate and generate their own unique sound frequencies that are picked up by the ultrasound probe. Microbubbles coated with anti-P selectin antibodies were injected after unclamping and both kidneys were scanned 10 minutes later. Isotype serum and sham operated mice were used as controls to determine background non-specific binding. Untargeted microbubbles were used to examine the microvascular flow. The software produced digital subtraction video intensity units which were compared in the different regions of the kidney. Results: In the sham left kidney, the corticomedullary junction (CMJ) had the highest blood flow (141.1) compared with renal medulla (43.7) and cortex (100.6) (all p<0.01). After unclamping, blood flow to the left kidney decreased from 576mm/s to 303mm/s, despite improvements in the color of the kidney from blue to pink. After 30 minutes of ischemia, when compared to the isotype serum, the expression of P-selectin increased by 41%, 25% and 14%, in the CMJ, cortex and the medulla, respectively. P-selectin expression was highest in the CMJ (432.1) compared with the cortex (369.4) and medulla (86.5, p<0.01). Conclusion: This pilot study of in vivo model of IRI, microvascular reperfusion was quantitated for the first time indicating that the CMJ region has the most blood flow and the most susceptible to ischemic injury as evidenced by 41% increase in expression of P-selectin immediately post-unclamping. Future studies are planned to correlate our findings with histochemical stains using superoxide dismutase.

3, 3' – Diindolylmethane and Genistein Decrease Adverse Effects of Estrogen for Prostate Cancer . Sunyata Smith; Center for Oncology and Cell Biology, Feinstein Institute for Medical Research, North Shore-Long Island Jewish Health System and Albert Einstein College of Medicine

Introduction: A substantial amount of evidence suggests that estrogen contributes to the risk of prostate cancer (PCa), whereas the phytochemicals genistein and 3'3-diindolylmethane (DIM) decrease the risk of PCa. This study examines the potential of these phytochemicals to reduce estrogen's impact on PCa. Methods: Using the androgen/estrogen sensitive LNCaP PCa cell line and the androgen/estrogen insensitive PC-3 PCa cell line, we examined the impact of DIM and genistein on: estrogen enhanced proliferation (MTS assay) and prostate specific antigen (PSA) expression (real time RT-PCR and ELISA), estrogen inhibition of apoptosis (nucleosome release assay) and estrogen metabolism (real time RT-PCR for metabolizing enzymes and GC/MS for metabolites). Results: In the estrogen sensitive LNCaP cells, both genistein and DIM decreased estrogen induced proliferation and PSA expression and decreased estrogen's inhibition of apoptosis. Estrogen had no impact on these activities in PC-3 cells. However, the phytochemicals decreased proliferation in

PC-3 cells independent of the presence or absence of estrogen. Genistein and DIM altered estrogen metabolism in both cell lines. Both nutrients increased expression of the 2-hydoxylation enzyme cytochrome P450 1A1 (CYP1A1) and the O-methylating enzyme catechol-o-mthyltransferase (COMT), while causing an increase in 2-hydroxyestrogen (2-OHE₂) and a decrease in 16α-hydroxyestrone (16α-OHE₁), a result that should result in less estrogenicity and increased amounts of the anti-cancer metabolite 2-methoxyestrone (2ME1). In all assays the combination of DIM and genistein was better than either nutrient alone. Conclusion: Our results provide evidence that both DIM and genistein could help decrease PCa by preventing the adverse effects of E2 that contribute to cancer development. Furthermore, our studies reveal that using these nutrients in combination provides a better protective effect than either nutrient alone, illustrating that it could be beneficial to use both nutrients in combination as a treatment strategy in combating prostate cancer.

A Novel Design for an Ideal Blind Spot Mirror in Automobiles for Impared Patients. Ketan Vora DO, Elena Belkin MD, Raj Tolat MD; Division of Physical Medicine & Rehabilitation, Department of Neurology, North Shore-Long Island Jewish Health System

The Purpose of this research paper is to describe in theory why the preferred embodiment blind spot mirror is better in prevention of accidents compared to other blind spot mirrors, for the elderly patients with cervical spondylosis, canal stenosis, herniated discs, chronic muscle spasms, many opthomological conditions. Previous blind spot mirrors encompass two problems. First, many encompass some form of convexity, which decreases the size of the image. Second, even when flat, they encompass another attachment mirror to cover the blind spot, which can be dangerous as the driver may not look at the right mirror just prior to an emergent accident. The preferred embodiment is a complex mirror with multi planar surface that incorporates a blind spot mirror piece to the traditional angle of 10.5 degress to the side-rear view mirror. This is attached to the far side of the complex multi planar mirror. It also incorporates the traditional side view mirror attached closer to the car. And finally it has a small transition zone that is cylindrical adjoins the two flat mirror pieces, in such a way as to be parallel to the connecting 2 flat mirrors (the blind spot piece and the traditional side view mirror piece). This middle transition zone will create a full image, with minor distortions, such that the physics of light will reflect a complete 180 to the driver. More importantly, it will act to provide the image in one piece, which has not been previously been documented. Obliterating the blind spot will allow patients with debilitating conditions, such as cervical arthritis to allow a more confident driving experience, as less cervical rotation will be required and decrease the number of accidents, as well as decreasing further damage through chronic rotation of the neck.

Cholinergic Agonists Attenuate Renal Ischemia-Reperfusion Injury in Rats. Michael M. Yeboah MD, Xiangying Xue MD, Bin Duan MD, Mahendar Ochani MD, Kevin J. Tracey MD, Myron Susin MD, Christine N. Metz PhD; Elmezzi Graduate School of Molecular Medicine, Feinstein Institute for Medical Research, North Shore-Long Island Jewish Health System

Introduction: Renal ischemia-reperfusion injury (IRI) is the leading cause of acute renal failure in hospitalized patients. The pivotal role of inflammation (characterized by cytokine production and leukocyte infiltration), as a key mechanism in renal IRI is wellestablished. The cholinergic antiinflammatory pathway (CAP) is a mechanism by which local inflammation is modulated by the brain via the vagus nerve and nicotinic acetylcholine receptors (nAChRs) expressed by peripheral cells. We hypothesized that cholinergic stimulation would attenuate the severity of tubular damage after renal IRI in rats. Methods: Male Sprague-Dawley rats underwent bilateral renal artery occlusion for 45 minutes followed by reperfusion. Cholinergic agonists, nicotine or GTS-21 were administered i.p 20 min before renal artery clamping or 2h after reperfusion. In a separate set of experiments, animals that had previously undergone subdiaphragmatic vagotomy (to mimic clinical renal transplants) received nicotine or vehicle prior to the induction of IRI. Rats were euthanized 24h post reperfusion and kidney samples were analyzed for TNF expression (ELISA), tubular damage (H/E staining), and leukocyte infiltration (MPO activity and Leder staining). Renal function was assessed by plasma creatinine levels. NRK52E cells (tubular epithelial cell line) were examined for the presence of functional nAChRs by flow cytometry and calcium flux studies. Results: Pretreatment with nicotine or GTS-21 significantly attenuated I/R-induced renal dysfunction and tubular necrosis. Similarly, kidney TNF protein production and leukocyte infiltration were markedly reduced by the agonists. Cholinergic stimulation significantly improved the tubular necrosis score in previously vagotomized rats after renal IRI, implying that an intact vagus nerve is not required for the observed renoprotection. Conclusion: Our study demonstrates that pretreatment with cholinergic agonists attenuate acute tubular injury and renal dysfunction following renal IRI in rats. This protective effect is observed even in vagotomized animals, suggesting potential benefit in renal transplant recipients. We also show for the first time that tubular epithelial cells, the most vulnerable cells during renal IRI, constitutively express functional nAChRs. Together, our data identify a novel role for the cholinergic antiinflammatory pathway in renal IRI.

Nicotinic Acetylcholine Receptor Expression and Regulation After Ischemia-Reperfusion Injury in Rat Kidney. Michael M. Yeboah MD, Xiangying Xue, Mohammad Javdan MD, Myron Susin MD, Christine N. Metz PhD; Elmezzi Graduate School of Molecular Medicine, Feinstein Institute for Medical Research, North Shore-Long Island Jewish Health System

Introduction: The cholinergic antiinflammatory pathway is a mechanism whereby local inflammation is modulated by the brain via the vagus nerve and nicotinic acetylcholine receptors (nAChRs). The alpha7 receptor (a7nAChR) mediates the antiinflammatory effects of cholinergic stimulation. We recently showed that cholinergic agonists (nicotine and GTS-21) attenuate renal ischemiareperfusion injury (IRI) in rats. In addition, we showed that tubular epithelial cells express functional nAChRs in vitro. In this current study, we examined the expression and localization of the α 7nAChR subunit in the normal kidney and its regulation after renal IRI. Methods: Male Sprague-Dawley rats underwent 45min of renal ischemia followed by 2, 4, 6, or 24h of reperfusion. Kidneys were harvested at the appropriate time. In addition, frozen kidney samples and formalin-fixed paraffin sections from rats treated with nicotine (1mg/kg) were available from our previous experiments. Results: RT-PCR and western blotting showed constitutive expression of the α7nAChR subunit. Immunohistochemistry localized basal α7nAChR subunit expression to the endothelium of cortical peritubular capillaries and the apical membranes of proximal tubules. IRI markedly up-regulated the α7nAChR subunit protein expression, with relatively more widespread expression in the cortical peritubular capillaries. Interestingly, pretreatment with nicotine reduced the α7nAChR expression after IRI. Similarly, IRI stimulated the Jak2/Stat3 pathway, a key signaling cascade that has been linked to a7nAChR activation, while pretreatment with nicotine downregulated their activation. These results suggest that the α7nAChR is involved in the pathophysiology of renal IRI. Conclusion: We have demonstrated that renal IRI modulates the expression of the α7nAChR, a ligand-gated ion channel that mediates the antiinflammatory effects of cholinergic activation. We have also shown evidence that administration of nicotine, a cholinergic agonist protects renal tubular cells from IRI probably by modulating the expression of the α7nAChR on the cell. Our report may encourage future studies aimed at exploring the detailed downstream mechanisms of the renoprotection achieved with cholinergic stimulation during renal IRI and, ultimately, allow us to develop novel therapeutic strategies based on the cholinergic antiinflammatory pathway to treat renal IRI and other inflammatory diseases.

CASE REPORTS

Obstructive Nephropathy in a Renal Allograft Caused by Noninvasive Aspergillus Infection: A Unique Approach to Therapy. Kellie Calderon MD, Hazzan A, Bhaskaran M, Ashfaq A, Gitman M, Richstone L, Hirschwerk D, Hussain E, Vasilopoulos D, Gopalakrishnan I, Ahuja K, Fazal R; Division of General Internal Medicine, Department of Medicine, North Shore University Hospital

Introduction: Aspergillosis is an important opportunistic infection in the renal transplant patient, notorious for causing invasive pulmonary disease while isolation in the collecting system is rare. It presents unique challenges due to its rarity and the immunocompromised state of the host. We present a case of aspergillus bezoars limited to a renal allograft causing obstructive nephropathy and describe our unique approach to management. Case Summary: A 51 year old man with a history of renal transplant for polycystic kidney disease in 1998 presented with decreased urine output for one day. Placement of a foley catheter yielded no urine and laboratory studies revealed acute renal failure (creatinine 7mg/dL). CT scan showed moderate hydronephrosis of the allograft. A nephrostomy tube was inserted into the transplanted kidney with good diuresis. Antegrade pyelogram revealed a proximal ureteral filling defect. Urine culture and cytology both identified aspergillus species. After one week of systemic antifungal therapy, repeat nephrostogram showed multiple persistent filling defects, presumed to be fungus balls. The bezoar was locally treated with continuous irrigation of the nephrostomy tube with amphotericin. However, the patient still had intermittent ureteral obstruction. To monitor intrarenal pressure a monometer with three way stop clock typically used for measuring intracranial pressure was connected to the patient's nephrostomy tube. Renal pelvis pressure was continuously monitored in the medical intensive care unit. The patient tolerated high flow rates with intrarenal pressures <20cm of water during infusion. Six days later a third nephrostogram showed brisk contrast flow through the collecting system. Discussion: Fungal bezoars are an uncommon cause of obstructive uropathy. The approach to these patients historically depended upon systemic antifungal therapy, however treatment failures and attempts to minimize the nephrotoxicity of these agents has led to the development of techniques for supplemental treatment. Local irrigation allows higher concentrations of the antifungal agent to reach the obstruction while minimizing systemic adverse reactions.

Additionally, we have provided a unique method for continuous intrarenal pressure monitoring to prevent further hydrostatic damage within the renal pelvis of the obstructed collecting system.

Ceftriaxone-Induced Hemolysis: A Case Report of a Rare, But Potentially Fatal Complication. Syed T. Hoda MD; Department of Pathology, North Shore-Long Island Jewish Health System

Cephalosporins are amongst the most widely used antibiotics in the hospital setting. Considering the number of patients given antibiotics such as Ceftriaxone, severe complications resulting from these are a rare event. This case is of a 6-year old girl with a history of multiple congenital cardiac anomalies admitted to the emergency room with fever positive for methicillin-resistant Staphylococcus Aureus. She was subsequently treated with Linezolid, Daptomycin, and Gentamicin for MRSA along with Cefapime. Cefapime was switched eventually to Ceftriaxone, and then switched back to Cefapime when Pseudomonas Aeroginosa and Citribacter Diversus were found on blood cultures. 24 hours after the Ceftriaxone was started, then discontinued, the patient underwent a large decrease in hemoglobin and hematcrit. Within 24 hours, the patient's hemoglobin and hematcrit went from 10.3/32.6 to an extremely low 1.3/4.3. She was transfused with 2 units of RBCs at 20 minutes and 160 minutes following the low Hb/Hct reading. Following transfusion, there was marked improvement back to a 9.1/29.2 reading. A direct coomb's test was positive for C3d complement activity. A sample of blood collected during the low hemoglobin reading was sent away to an outside lab for specialist reading of antibody analysis. The results showed a positive antibody response to Ceftriaxone on the red blood cells from the blood. This positive finding may have contributed to the hemolysis and low Hb/Hct found on the patient's lab results. Autopsy findings documented the patient's extensive history of congenital cardiac anomalies; including heterotaxy, abnormal pulmonary vessels, and a single chamber ventricle with right morphology; amongst many other findings documented. There are less than 40 known and documented cases of ceftriaxone-induced hemolysis documented upon literature search. The positive antibodies found in this patient's blood to ceftriaxone have made this a very likely contributor to this patient's death. If the severe structural and congenital anomalies are combined to this scenario of a severely traumatic drug-associated hemolytic reaction as witnessed in this case; it is difficult to conceive a good patient prognosis. Drug-induced hemolysis is a severe complication and should be considered when there is evidence of a rapid hemolytic reaction.

Second Degree Heart Block in a Patient with Systemic Lupus Erythematosus. Hana Hulinska MD PhD, Maria-Louise Barilla-LaBarca MD, Richard Furie MD; Division of Rheumatology and Allergy-Clinical Immunology, Department of Medicine, North Shore University Hospital

Introduction: Cardiac involvement in patients with lupus is frequent. While conduction abnormalities are well characterized in infants of mothers with Ro/SSA antibodies, the incidence in adults is low and its mechanism is not well understood. We report a case of an adult patient with systemic lupus erythematosus (SLE) and antiphospholipid syndrome (APLS) who developed second degree heart block. We explore possible pathogenesis and suggest anticipatory electrocardiographic monitoring of these patients. Case: A 33 year old man with SLE was admitted after a syncopal episode. He had a history of an ischemic stroke from APLS and was on therapeutic anticoagulation. On admission, physical exam and blood tests were normal without stigmata of active SLE. EKG revealed a 1st degree heart block with an intermittent second degree AV block and a pacemaker was placed. Discussion: Given the EKG changes, the most likely etiology of the patient's syncope was cardiac. Rhythm abnormalities are common in SLE and APLS, but conduction irregularities are believed infrequent in adult patients. First degree heart block is often transient, and higher degrees of heart block are distinctly unusual although a few authors suggest a 10% prevalence. To make a direct link to SLE is difficult as there are no reports of myocardial biopsy in an SLE patient with a new heart block. Autopsy reports of patients with SLE showed inflammatory cell infiltrates and fibrous scarring of the conduction system. A nodal artery occlusion resulting from vasculitis causing degeneration and fibrosis of the AV node is plausible. Patients with APLS are at risk for thrombosis and there have been reports of intramyocardial arteriolar occlusive thromboses on autopsy. We hypothesize that this process can affect the AV node as well. Though it is unclear which pathogenic mechanism is occurring, it is possible that we are underdetecting the true incidence of conduction deficits in this population. More studies need to be done. We propose that patients with SLE/APLS should have a periodic EKG to anticipate and prevent catastrophic outcomes.

West Nile Virus Induced Meningo-Encephalitis in a Renal Transplant Patient. Hasan Khondker MD, Michael Gitman MD; Department of Medicine, North Shore University Hospital

West Nile virus is a mosquito-borne, single-stranded RNA virus of the Flaviviridae family. Approximately 1 in 150 patients who have serologic evidence of West Nile virus infection develop encephalitis or meningitis. Immunosuppression is a risk factor for West-Nile encephalitis and despite their requirements for chronic immunosuppression, there have been few reported cases of severe West Nile illness occurring in renal transplant patients. Furthermore, there is little known about their ultimate recovery. We present a case of a renal transplant patient who presents with severe neurological symptoms secondary to the West Nile Virus. A 60 year old male with history of Autosomal Dominant Polycystic Kidney Disease, status post living related kidney transplant 2 years prior to presentation, presented with headache, fever, photophobia, and neck stiffness of three weeks duration. He denied cough, congestion, diarrhea, nausea, or vomiting. He lived in New York and denied recent travel or exposure to horses or mosquitoes. Medications included tacrolimus, mycophenolate mofetil, and prednisone. Initially, the patient was febrile at 100.5 degrees and physical exam was remarkable for nuchal tenderness and rigidity. Labs were significant for a WBC count of 8.3 and a lumbar puncture showed CSF with a glucose level of 76, protein level of 94, WBC count of 25, and RBC count of 57. The patient was admitted with a presumptive diagnosis of meningitis, started on broad spectrum antibiotics, and immunosuppression was minimized. Initial serologic studies for West Nile with an IgM ELISA study were indeterminate. Also, CSF PCR for HSV, HHV-6, CMV, and Eastern Equine Encephalitis were negative. Soon, progressive neurologic decline led to intubation. A second serologic work up on day 20 resulted in a reactive West Nile IgM ELISA, confirmed by plaque reduction neutralization and polyvalent MIA. The patient was eventually extubated and slowly improved over a four week hospital course and was discharged to a rehabilitation facility. He subsequently returned home and made a full recovery This is one of the few documented cases of West Nile Encephalitis in a renal transplant patient. It emphasizes the role that immunosuppression plays in the virulence of the disease and also shows that even those who are most severely affected can achieve a full recovery with supportive care and minimization of immunosuppression.

Thymic Carcinoma Diagnosed on a Lung Mass FNA. Sandra Matano MD, Nora J. Morgenstern MD; Division of Cytology, Department of Pathology, North Shore-Long Island Jewish Health System

Introduction: Thymic carcinoma (type C, in the WHO classification), is a rare and highly aggressive neoplasm of the anterior mediastinum. Cytologic reports of 100% predictive value and 71% sensitivity for the benign counterpart (thymoma) exist. However, to our knowledge, a primary cytologic diagnosis of thymic carcinoma has not been previously reported in the English literature. We describe a case of thymic carcinoma diagnosed for the first time on a lung mass Fine Needle Aspiration (FNA) from a 69 year old female patient presenting with negative mediastinal findings on CT scan. Review of Long Island Jewish Hospital Pathology files from 1997-2007 rendered 2 thymic carcinomas and 18 thymomas diagnosed by incisional biopsy or surgical resection (not by FNA cytology). The 2 thymic carcinomas demonstrated squamous differentiation. Methods: Lung mass FNA and core biopsy were obtained by bronchoscopy. Cytologic smears were stained with Diff-Ouik and Papanicolaou stains. The core biopsy was stained with Hematoxilin & Eosin (H&E) and immunohistochemical stains for Cytokeratin AE1/AE3, CD4, CD8, CD1-A, CD99, CD5, TTF-1, and Bcl-2. Results: Cytologic smears showed rare groups of pleomorphic malignant epithelial cells admixed with a polymorphous, predominantly small lymphoid population. Core biopsy showed similar epithelial groups, (strongly positive for cytokeratin AE1/AE3, in a meshwork arrangement) obscured by lymphocytes, phenotypically consitent with thymocytes (CD4+, CD8+, CD1-A+). The cytologic diagnosis was thymic carcinoma, lymphoepithelioma-like type. Subsequent resection of the lung mass revealed a thymic carcinoma arising in a type B2 thymoma. Conclusion: Our case demonstrates the value of ancillary studies in confirming a cytologic diagnosis when encountered with scanty material and emphasizes the importance in considering a thymic neoplasm when presented with a lymphoepithelial lesion, even if not radiologically situated in the mediastinum, as in this case.

Reconstruction of the Edentulous Maxilla with Zygomatic Implants Following Treatment with Intravenous Bisphosphonates. Kerry McEntee DMD, MD; Department of Dental Medicine, Long Island Jewish Medical Center

Purpose: Intravenous bisphosphonates pamidronate (Aredia) and zofendronate (Zometa) are used to prevent the progression of metastatic cancer deposits in bone and to reduce the hypercalcemia of malignancy. They are most commonly used in patients suffering from multiple myeloma and metastatic breast cancer. The antiresorptive action of the intravenous bisphosphonates prevents pathologic bone resorption and subsequently improves the quality of life and extends the life span of these patients. A side effect of the antiresorptive properties of these drugs is that the drugs prevent normal remodeling of bone which can result in osteonecrosis of the jaws 1. In severe cases of osteonecrosis of the jaws, resection of the jaw bones is indicated 2. Reconstructive surgery in these patients is challenging and can result in further progression of existing osteonecrosis and even initiation of new foci of osteonecrosis. In this case report, we describe the successful reconstruction of the maxllia in a patient who had resection of the maxilla for the treatment of osteonecrosis following intravenous bisphosphonate therapy for metastatic breast cancer. Patients and Methods: A 58year-old female presented with extensive osteonecrosis of the maxilla following treatment with the intravenous bisphosphonate zofendronate for bone metastasis secondary to breast cancer. The patient underwent surgical resection of the maxilla with secondary reconstruction with implant placement to the zygomatic arches, pterygoid plates, and the piriform regions. A review of the literature regarding the etiology and prognosis of osteonecrosis and treatment alternatives is given. Result: Successful integration of five out of seven implants provided the patient with a functional and esthetic prosthesis. No post-operative complications were noted over a two year period. Conclusion: Zygomatic implants are a potential treatment alternative for maxillary reconstruction in patients previously treated with intravenous bisphosphonates for the control of bony metastasis.

Spontaneous Intracranial Hypotension in Association with the Presence of a False Localizing C1-C2 Cerebrospinal Fluid Leak. Jonathan T. Morgan D.O, Alexander J. Scumpia B.A., Alan A. Johnson M.D., Steven J. Schneider M.D.; Department of Neurosurgery, Long Island Jewish Medical Center

Background: Spontaneous intracranial hypotension is an increasingly recognized cause of new onset, daily persistent headaches. Although these headaches are similar to post-lumbar puncture headaches, characteristic differences include: intracranial pachymeningeal enhancement, subdural fluid collections, and downward displacement of the brain. The identification of upper cervical epidural fluid collections as a false localizing sign in patients with spontaneous intracranial hypotension (SIH) has provided significant insight into the selection of management options. Case Description: We review a case of a 57-year-old female who presented to our institution with progressive orthostatic headaches relieved by recumbency. The patient had no recent history of lumbar puncture, spinal, or intracranial procedure. The patient isolated the onset of symptoms to three weeks prior, when she was lifting heavy items in her home and was diagnosed with spontaneous intracranial hypotension. Subsequently, she was found to have a C1-C2 epidural fluid collection. After much diagnostic consideration and review of the literature, the collection was defined as a false localizing sign and the patient eventually underwent a lumbar epidural blood patch with complete resolution of her symptoms. Conclusions: Upper cervical fluid collections in patients with SIH often represent a false localizing sign. Conservative management should be instituted and if unsuccessful, a lumbar epidural blood patch should be performed. It is important to note that C1-C2 fluid accumulations may not provide the actual leak site in patients presenting with SIH. This understanding prevents therapy from being unintentionally directed at C1-C2.

Case of Metastatic Thymoma with Bone Marrow Involvement.

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Introduction: Thymoma is a rare disease of the thymus gland. It is usually found in the encapsulated form, however, when malignant, it invades the locally. Extrathoracic spread of thymoma is very rare. On our review of literature, bone marrow involvement has not been reported. We present the first reported case of malignant thymoma with widely metastatic extrathoracic disease with bone marrow involvement. **Case Description:** We report a case of a 24 year old Chinese male with history of chronic hepatitis B who presented to our institution with back pain accompanied by difficulty walking, peroneal numbness, urinary retention, and low grade fevers for 3 months. MRI of the lumbar spine revealed compression fracture at L1 with osseous metastases involving lumbar and sacral spine. A CT scan revealed an 8.5cm x 7.6cm anterior mediastinal mass, 13x9cm left lung mass with multiple pulmonary nodules, and a 2.8cm liver lesion. Upon initial presentation, concern was raised regarding the possibility of a germ cell tumor or lymphoma. Physical exam did not reveal a testicular mass. Laboratory evaluation revealed a complete blood cell count, metabolic profile, lactate dehydrogenase, beta-human chorionic gonadotropin, and alpha-fetoprotein all within normal limits. CT guided biopsy of the mediastinal mass was performed consistent with thymoma. Secondary to widely metastatic disease, concerns were raised for an alternate malignant process. A liver biopsy was performed at the time, revealing a poorly differentiated malignant tumor. Bone marrow biopsy was performed to rule out lymphoma, revealing extensive extrinsic cell infiltrate consistent with involvement of

malignant thymoma, confirmed by immunohistochemical stains. **Discussion:** Less than ten percent of malignant thymomas develop extrathoracic spread. When extrathoracic spread does occur, the most common sites are liver, kidney, bone, and brain. We are reporting what we believe to be the first case of thymoma with bone marrow involvement. Given the lack of previous reported cases, further studies should be done to assess the impact of bone marrow involvement on survival in metastatic thymoma.

An Unusual Case of Catatonia. Purvesh R Patel MD; Division of General Internal Medicine, Department of Medicine, Long Island Jewish Medical Center

Introduction: Author reports a case of clozapine withdrawal catatonia. Withdrawal can be confused with psychotic relapse, so differentiation between them is essential. Withdrawal symptoms with neuroleptics are somatic, extrapyramidal and psychotic. Withdrawal of typical antipsychotic are generally mild and switching form one agent to another is feasible without withdrawal as they all share D₂ blocking property, but clozapine withdrawal can cause severe withdrawal symptoms probably due to its unique receptor profile. Malignant excited catatonia and neuroleptic malignant syndrome has also been reported but simple retarded catatonia has not been reported. Case Report: A 60 year old female with schizoaffective disorder was well maintained on clozapine. Due to clozapine induced leucopenia she was switched to quetiapine. After the switch on day 3, she stopped communicating so she was taken to other hospital. On presentation there she was catatonic. She had negative work up for medical causes of catatonia and she didn't improve for 20 days so she was presumed to have catatonic state secondary to her schizoaffective disorder and transferred to us for medical clearance for ECT at Hillside Hospital. On presentation to us, immobility, mutism, negativism, catalepsy, waxy flexibility, stupor, parkinsonian tremors and rigidity were apparent, but autonomic instability was absent. Work up failed to reveal any medical causes. She was given benztropin challenge without response, with lorazepam patient's catalepsy and waxy flexibility but patient still exhibited mutism, negativism and stupor. We reinstated clozapine and gradually over 4 days her catatonic features resolved completely. Discussion: On admission, two major hypotheses were considered; the condition is either due to schizoaffective disorder or due to clozapine withdrawal. Clozapine withdrawal symptoms can be due to cholinergic, serotonergic, dopaminergic and GABAergic mechanisms. Chronic clozapine treatment increases GABA turnover in the substantia nigra. Low GABA_A, high 5-HTl_A, low D₂ activities predisposes for catatonia and perturbations of any of these receptors can result in catatonia. Improvement in catalepsy and waxy flexibility with lorazepam suggests loss of GABAergic effect of clozapine upon abrupt withdrawal might have contributed to those symptoms. Patient's mutism and stupor improved only after clozapine reintroduction suggests clozapine's unique receptor profile was responsible for catatonic features. The close temporal relationship between the clozapine discontinuation and onset of catatonia with no other explanation for catatonia suggests that the catatonic state was secondary to the clozapine withdrawal. We recommend clozapine should be tapered over 2 weeks. A slow withdrawal schedule would allow homeostasis.

The Use of Recombinant Human Bone Morphogenetic Protein-2 in Maxillary Sinus Floor Augmentation: Report of a Case and Discussion. Joshua Segal DDS; Division of Oral & Maxillofacial Surgery, Department of Dental Medicine, Long Island Jewish Medical Center

Endosseous dental implant success is contingent on the presence of a sufficient quality and quantity of bone. In a patient with maxillary edentulism, maxillary sinus floor augmentation grafting is often performed to provide adequate bone for the placement of dental implants. Various bone graft materials may be used including autogenous bone, allografts and xenografts. Autogenous bone has excellent osteoinductive properties, but may be complicated by donor site morbidity. Allografts and xenografts, while readily available, yield significantly less de-novo bone formation. Bone morphogenic proteins (BMPs) are a class of osteoinductive proteins that are able to stimulate bone formation in vivo by acting on osteoprogenitor cells. The direct application of recombinant BMPs was approved by the United States Food and Drug Administration for use in several orthopedic procedures, and more recently as an alternative to traditional grafts in maxillary sinus augmentation. We present a case in which recombinant bone morphogenic protein-2 impregnated absorbable collagen sponge (rh-BMP-2 ACS, Infuse®-Medtronic) was used in maxillary sinus floor augmentation with outstanding results. A 37-year old female presents for reconstructive jaw surgery for correction of a skeletal facial deformity. The patient had edentulous areas in the upper right and left maxilla with inadequate bony height for which she desired dental implants. The skeletal facial deformity was corrected with a Lefort I osteotomy and rhBMP-2 ACS was placed beneath the Schneiderian membranes bilaterally. Following a period of 5 months radiographs and core biopsies were obtained, and endosseous dental implants were placed into sites 2,4,14, and 15. Radiographic evaluation revealed an increase in bone height from 5mm to 12mm and histological analysis revealed mature bone formation. The dental implants were successfully loaded with fixed restorations and the patient was satisfied with both the esthetic and functional result. This case illustrates the potential that rh-BMP ACS has in revolutionizing maxillary sinus augmentation. The rh-BMP ACS allows the clinician to take advantage of excellent osteoinduction without the concerns of donor site morbidity.

Neurotoxicity in Patients Treated with Intravenous Polymyxin B:

2 Case Reports. Lenny Weinstein D.O., Thien-Ly Doan Pharm.D, Miriam A. Smith M.D.; Department of Medicine, Long Island Jewish Medical Center

We report two cases of polymyxin B-induced neurotoxicity in patients infected with multidrug-resistant (MDR) organisms. We hypothesize that the phenylalanine component in polymyxin B molecule may contribute to the neurologic adverse drug reactions (ADR). In Both cases neurotoxicity was reversible after discontinuation of Polymyxin B. The emergence of MDR gram-negative bacilli has lead to resurgence in the parenteral use of the polymyxins within the last decade. More recent literature has suggested that drug-induced neurotoxicity is less prevalent in the new era of polymyxin use. A 60-year-old woman with recurrent UTI was admitted to our hospital for hematuria and dysuria. The urine culture yielded *Klebsiella pneumoniae*, susceptible only to polymyxin B and gentamicin. Within one hour of the infusion of the first dose of polymyxin B, the patient experienced oral paresthesia. A 57-year-old man was admitted for ascending cholangitis and infected pancreatic cyst. The abdominal drain culture yielded: a broadly susceptible *E. coli* and an MDR *Klebsiella pneumoniae* susceptible only to polymyxin B, gentamicin. He was discharged home on polymyxin B sulfate and imipenem for continued treatment of the pancreatic abscess. After thirty days of intravenous therapy, the patient reported oral and lower extremity paresthesias. *Discussion*. The usage of the polymyxins fell out of favor due to the incidence of renal and neurologic adverse events. However, with an increased incidence of MDR gram-negative bacteria resistant to most classes of antibiotics including carbapenems, the polymyxins remain a viable treatment option. The sole difference between colistin and polymyxin B is one amino acid. The D-leucine component found in colistin is replaced with D-phenylalanine in polymyxin B. Phenylalanine can produce neurotoxicity when cells are exposed to a high concentration, especially in the immature nervous system.

In a retrospective analysis of 29 courses of polymyxin B as adjunctive therapy for the treatment of MDR respiratory tract infections, there were two occurrences of neurotoxicity characterized by seizures and neuromuscular weakness attributed to polymyxin B therapy. In a publication by Linden and colleagues, one of 26 patients experienced neurotoxicity receiving IV colistin treating MDR *Pseudomonas aeruginosa*. We hypothesize that with accumulation of the drug in the system, there is subsequent build up of phenylalanine resulting in neuronal damage.

CLINICAL SCIENCE RESEARCH

Relative Prevalence and Clinical Features of Pediatric Respiratory Infections De to Respiratory Syncytial Virus (RSV) and Human Metapneumovirus (hMPV) at a Large Pediatric Referral Center. Christy Beneri DO, Sunil Sood MD, Christine Ginocchio PhD; Division of Infectious Diseases, Department of Pediatrics, North Shore-Long Island Jewish Health System/Schneider Children's Hospital

Objectives: The purpose of this study was to compare the relative prevalence and clinical features of respiratory tract infections caused by respiratory syncytial virus (RSV) and human metapneumovirus (hMPV) in young children. **Methods:** All nasopharyngeal swab/wash specimens (n=652) collected 10/2004-4/2006 from children <5 yr in clinic, emergency and inpatient settings for routine viral DFA and culture were tested for RSV and hMPV using NucliSENS EasyQ analyte specific reagents and the NucliSENS EasyQ Basic Kit (bioMérieux, Durham, NC). Clinical features were assessed by chart review (n=64) for 35 RSV+, 26 hMPV+, 3 RSV+/hMPV+ children. Standardized case report forms were used to evaluate demographics, admission status, and clinical findings. **Results:** 141 (22%) were RSV+ (<2 yr: 27.5%; 2-5 yr: 12.7%), 35 (5%) were hMPV+ (<2 yr: 5.8%; 2-5 yr: 4.6%). The following data were obtained from the chart review portion of the study. RSV and hMPV seasons overlapped in both years although RSV peaked earlier (Dec and Jan) than hMPV (Jan and April). For both RSV+ and hMPV+, 65% were <2 yr old and 34% were 2-5 yr old. hMPV+ were more likely to present with fever (p < 0.001) and rash (p = 0.01). RSV+ were more likely to present with rhinorrhea (p = 0.003) and diarrhea (p = 0.03). There was a trend towards more chest radiographs in hMPV+ patients (p = 0.055). 19.2% of hMPV+ required mechanical ventilation vs. 11.4% of RSV+ but there was no difference in length of ICU or total hospital stay. Patients coinfected with RSV and hMPV did not have more severe disease. **Conclusion:** In our patient population, hMPV infection was more likely to present with febrile rash illness. Disease severity was comparable to RSV.

Echocardiographic Predictors of Ventricular Tachycardia. John N. Catanzaro MD, John Makaryus, MD, Amgad Makaryus MD, Christina Sison PhD, David Donaldson MD, Christos Vavasis MD, Stuart Beldner MD, Bernard Boal MD, Ram Jadonath MD; Department of Medicine, North Shore University Hospital

Background: The cardiac microenvironment is altered in patients with structural heart disease to act as a substrate for arrhythmogenicity. The most common life-threatening arrhythmias that occur in these patients are ventricular tachycardia (VT) and ventricular fibrillation, which account for the majority of sudden cardiac deaths (SCD). We sought to examine echocardiographic parameters associated with VT as documented by implantable cardioverter defibrillator (ICD) appropriate discharge. Methods: Analysis of 591 patients (474 males; mean age at implantation 68±13yrs; follow-up 11±14 months) was undertaken. Echocardiographic parameters were analyzed (left ventricular internal end diastolic dimension [LVIDD], left ventricular internal end systolic dimension [LVIDS], relative wall thickness, and left atrial [LA] size to determine association with the incidence of first VT and recurrent VT as documented by appropriate ICD discharge. Results: The incidence of VT was 0.21 (114 VT episodes per 535 person-years). Median time to first VT was 3.8 years. There were 79 patients who had VT (59 with a single VT incidence and 20 with multiple episodes). Risk factors associated with VT included: age>65 yrs (p=0.02), CABG surgery (p=0.001), digitalis use (p=0.01), diuretic use (p=0.02) and LVIDS>4cm (p=0.02). A proportional hazards regression showed that the most important variables associated with time to first VT were CABG and LVIDS>4cm. In patients with recurrent VT episodes and followed for one month (n=20), there was a significantly higher recurrence of VT in patients with an abnormal LA size than in patients who had a normal LA (p=0.038). There was also a trend toward a lower recurrence of VT in patients who used antiplatelet medications than those who did not (p=0.16). Conclusion: The main echocardiographic predictor associated with the first occurrence of first VT is LVIDS >4cm and recurrent VT is LA enlargement. Patients who have had CABG were 2.8 times less likely to have VT than those without CABG. Patients with an LVIDS >4cm were 2.8 times more likely to have VT. These are the patients with structural heart disease who therefore need more aggressive pharmacologic therapy and warrant implantation of an ICD for primary prevention of SCD.

Correlation of a Scintigraphic Pulmonary Perfusion Index with Hemodynamic Parameters in Patients with Pulmonary Artery Hypertension. Kennedy Omonuwa MD, Talwar Arunabh MD, Kenneth J. Nichols PhD, Christopher J Palestro MD, Barry Babchyck DSc; Department of Medicine, North Shore University Hospital

Objectives: To determine if the perfusion index (PI) can be used as a simple, noninvasive measure of the severity of disease in pts with pulmonary artery hypertension (PAH). **Methods:** 22 pts were included in this retrospective investigation: 9 controls & 13 pts with PAH. Controls had no evidence of PAH (mean pulmonary arterial pressure (MPAP) <25 mm Hg & pulmonary capillary wedge pressure (PCWP) <=18 mm Hg). Study pts had PAH (MPAP>= 25mm Hg & PCWP <=18 mm Hg) & no diagnosis of pulmonary embolism. Due to the retrospective nature of the study, the PI was calculated from the posterior perfusion image of a ventilation perfusion scan. Each perfusion image was assessed to determine the percent of extrapulmonary activity vs. pulmonary activity. If this activity > 10% of maximum lung value, pts were excluded from the investigation (n=27). PI was computed as the sum of differences squared versus control for the 9 deciles above background. **Results:** Linear correlations vs. PI were significant for the following: pulmonary vascular resistance (r=0.81, p=0.00009), total pulmonary vascular resistance (MPAP/cardiac output) (r=0.80, p=0.0013), pulmonary artery systolic pressure (r=0.73, p=0.0018), MPAP (r=0.72, p=0.00022), pulmonary diastolic pressure (r=0.53, p=0.01) and right atrial pressure (r=0.50, p=0.03). Using logistic regression the PI was significant in separating pts with PAH from control pts (χ2=5.6, p=0.02). **Conclusions:** The data suggest that PI can be used for the noninvasive diagnosis & measurement of severity of pulmonary artery hypertension.

Evaluation of Pediatric Patients with Mild-to-Moderate Hypertension: Yield of Diagnostic Testing. Jonathan Wiesen, Matthew Adkins, Sherwin Fortune, Judah Horowitz, Rachel Frank RN CNN, Suzanne Vento RN, Cathy Hoffman RN, Beatrice Goilav MD, Howard Trachtman MD, Department of Pediatrics, Schneider Children's Hospital

Background: Children with newly-diagnosed hypertension undergo various blood, urine, and imaging tests to define the cause and end organ consequences of the elevated blood pressure (BP). The yield of this battery of tests, especially in patients with mild-to-moderate hypertension who are generally healthy, has not been systematically assessed. **Objective:** To test the hypothesis that the diagnostic yield of individual components of the currently recommended assessment is not sufficiently high to justify performance in all pediatric patients with mild-to-moderate hypertension. **Design/Methods:** A retrospective chart review was conducted on patients referred between 7/2002 - 6/2007 with mild-to-moderate hypertension, defined as maximal BP below 95% + 20/10 mm Hg. The evaluation included history and physical examination, nutritional assessment, urinalysis, biochemical and fasting lipid profile, renal ultrasound, echocardiogram, and 24-hr ambulatory blood pressure monitoring (ABPM) in cooperative children. Due to age and technical problems, testing was not complete in all patients. **Results:** 249 patients were seen for mild-to-moderate hypertension and

220 (88%) records were reviewed. There were 156 males and 64 females, age 13.3±4.4 yr. BMI was 26.1±6.7kg/m² and 143 (65%) had BMI >90%. Urinalysis and serum biochemical testing were normal in all cases. Among those with a lipid profile, cholesterol level

was 168±33 mg/dl; 59 (42%) had values above 170 mg/dl and 26 (19%) had severe hypercholesterolemia (>200 mg/dl). Renal sonography revealed findings that might be associated with hypertension in 13 patients (7%) but only 3 had renovascular abnormalities (1.6%). Yield of echocardiography was 17%, LVH in 19 (11%) patients and other abnormalities (aortic coarctation, n=4) in 10 (6%). On ABPM, 47 (60%) children had systolic readings >95% at least 20% of the time and 28 (36%) had diastolic readings >95% at least 20% of time. **Conclusions:** Most children and adolescents with mild-to-moderate hypertension probably have essential hypertension based on a positive family history, elevated BMI, and hypercholesterolemia. Using a cut-off of 10% abnormal results to define a useful test, the initial evaluation can be limited to a fasting lipid profile, echocardiogram, and ABPM. Further testing should be guided by specific clinical features or abnormal results in the above tests.

Early Postoperative Surveillance of EVAR and Endoleak Prediction Using Intrasac Pressure Monitoring. Feng Qin MD, Luis Davila-Santini MD, Rajeev Daval MD, Justin Rafael MD, Ravi Pulipati MD, Richard Schultzer MD, Kambhampaty Krishnasastry MD, FACS; Division of Vascular Surgery, Department of Surgery, North Shore-Long Island Jewish Health System Objective: To explore the utility of intrasac pressure monitoring for EVAR surveillance and its utility for endoleak prediction. METHODS: 70 consecutive EVAR had concurrent CardioMEMS Endosure® implantation in 2007. Sac pressure was measured prior to aneurysm exclusion, post-exclusion, and follow-up to 12 months. To eliminate blood pressure variation, pressure indexes were created as ratios of sac pressures to systemic pressures as follows: systolic (SPI), diastolic (DPI), mean (MPI) and pulse (PPI) pressure index. CT scans were obtained at 1, 6, and 12 months, or anytime an endoleak was suspected. Results: Technical success of endosure implantation was 98% (69/70). No perioperative mortality occurred. Mean follow-up was 6 months (range 1 - 12 months). 1.) In patients without endoleak, a consistent pattern of sac pressure change, independent of individual systemic pressure variation, was observed during EVAR and follow-up. DPI elevation, SPI and PPI drop signaled successful sac exclusion. Sac pressures decreased continually in next 2 weeks and remain plateau (MPI < 0.6, PPI < 0.3) (p < .01) for up to 12 months. 2.) Follow-up CTA demonstrated a linear correlation between diminishing sac pressure and diminishing sac size (Pearson's coefficient, r = 0.87), and this correlation was independent of original aneurysmal size. 3.) Five type I endoleaks (3 intraoperatively, 2 follow-up) were discovered by sac pressure equivalent to systemic pressure (MPI \approx 1), and pulsatile waveform with PPI > 0.6 (p < 0.1). All were confirmed by angiogram (intra-op) or CTA and were treated successfully with extension cuffs. 4.) Twelve type II endoleaks/endotensions were suspected with variant MPI elevation (> 0.6) but moderate PPI elevation (< 0.6) (p < .01). CTA confirmed 10 of 12 cases as type II arising from the IMA or lumbar arteries. The remaining 2 cases were endotension. They resolved spontaneously or by coil. Conclusions: A consistent pattern of sac pressure evolution after EVAR exists. Diminished sac pressure correlates to regressing sac size. The presence and type of endoleak can be predicted based on the character of sac pressure elevation. Long-term study is required to examine its potential to replace CTA for EVAR, but early surveillance appears enhanced with this modality.

Laparoscopic Ureteral Reimplantation: Technique and Outcomes. Casey Seideman, Chad Huckabay MD, Jane S. Cho, Benjamin R Lee MD, Lee Richstone MD, Louis R Kavoussi MD; Department of Urology, Long Island Jewish Medical Center

Purpose: To describe our experience with laparoscopic ureteral reimplantation in 42 adult patients and report success rates and complications with intermediate-term follow-up. **Methods:** We conducted a retrospective chart review of 42 patients who underwent laparoscopic ureteral reimplantation between 1997-2007. Demographic, clinicopathological parameters, peri-operative course, complications, and follow-up radiographic studies were analyzed. **Results:** Elective laparoscopic ureteral reimplantation was performed on 42 patients, 32 females and 10 males, with a mean follow-up of 24.1 months (range 3-76). All patients presented with distal ureteral strictures, with a mean stricture length of 3 cm and a mean preoperative serum creatinine of 0.91 (+/- 0.04). Mean age was 47.1 +/- 2.2 (17-87). Mean ASA score was 2 (1-3). Median EBL was 150 mL. Overall success rate, defined as radiographic evidence of no residual obstruction and absence of symptoms, renal deterioration, or need for subsequent procedures, was 95%. Two patients had recurrent strictures, one underwent nephrectomy for flank pain and pre-existing chronic pyelonephritis, and the other underwent endoscopic management. Four patients experienced post-operative complications, including, *c. difficile* colitis, ileus, small bowel obstruction, respiratory distress and 3 anastomotic leaks that resolved with urethral drainage. **Conclusions:** Laparoscopic ureteral reimplantation, with intermediate follow-up data, can be performed with excellent success rates and low morbidity. Our data substantiates this technique as an effective method of managing distal ureteral strictures.

Parenchymal Echotexture Predicts Testicular Salvage After Torsion: Potential Impact on the Need for Emergent Exploration. Edan Y. Shapiro, Jonathan D. Kaye MD, Selwyn B. Levitt MD,

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Introduction: In the presentation of testicular torsion, the absence of diastolic flow and/or color flow on Doppler ultrasound has traditionally prompted emergent scrotal exploration. This practice emanates from the difficulty in radiologically distinguishing torsed testes that are salvageable from those that are not. We sought to identify ultrasound findings that could be predictive of testicular viability. Methods: A retrospective review was performed for all boys who underwent scrotal exploration for torsion over a four-year

period. Ultrasound findings, operative dictations, and pathology reports were reviewed. The parameters were compared between patients who underwent orchiectomy for non-viability versus those who underwent orchidopexy for viable testes. Emergency room charts were reviewed to determine the duration of time from onset of pain until ultrasound, and the time between ultrasound and surgery. Results: A total of 55 boys were surgically explored after scrotal Doppler ultrasound demonstrated absence of diastolic flow and/or color flow. Assessment of parenchymal echogenicity revealed heterogeneity in 37 (67%) patients and homogeneity in 18 (33%) patients. Zero of the 37 with a heterogeneous pattern had a viable testis at exploration. Orchiectomy was performed in 34 of the 37 cases and pathology revealed necrosis in all 34 of these cases - a finding consistent with late torsion. The remaining 3 testes underwent orchidopexy by parental directive despite non-viability (confirmed by biopsy and subsequent atrophy). Thus, heterogeneity on pre-operative ultrasound was universally predictive of organ loss (p<0.001). 16 of the 18 (89%) testes with a homogenous pattern were deemed viable at exploration. There was a mean pre-operative pain time of 27.5 hours (range 5-72) in the boys with non-viable testes, compared to 20.5 hours (range 2-96) for boys whose testes were salvaged (p=0.073). There was no statistically significant difference in the time to surgery between the two groups (p=0.92). None of the patients suffered any surgical or anesthetic complications, nor was any pathology noted in the contralateral, asymptomatic, testis. Conclusions: In the setting of Doppler-proven testicular torsion, heterogeneous parenchymal echotexture indicates late torsion and non-viability, and therefore may not require emergent scrotal exploration. On the other hand, the presence of homogeneous echotexture portends extremely well for testicular viability. Such testes should therefore be explored emergently.

The Diagnostic Value of Somatosensory Evoked Potentials and Conventional Electromyography in the Management of Cervical Spondylosis. Amit Mahesh Shelat D.O. M.P.A.; Department of Neurology, North Shore-Long Island Jewish Health System Introduction: Cervical spondylosis, a common cause of chronic pain, accounts for approximately 2% of all hospital admissions. There is a paucity of clinical information in patients with cervical spondylosis with respect to identifying functional abnormalities in cervical nerve roots and the spinal cord. The use of electrophysiological studies, such as somatosensory evoked potentials (SSEP) and electromyography/nerve conduction studies (EMG/NCS), often facilitate the diagnosis and treatment of this condition. This study assessed the diagnostic value of electrophysiological studies in identifying functional abnormalities in cervical nerve roots and spinal cord to help direct the clinician in selecting the most appropriate treatment. Methods: A retrospective analysis of electrophysiological and radiological studies from 128 patients (79 Male, 49 Female) diagnosed with cervical spondylosis was performed. The average age of the patients was 52 years (range 30-75 years). All patients had undergone EMG/NCS by a board-certified electromyographer. The SSEP studies of median and posterior tibial nerves were performed by an electrophysiologic technician and interpreted by a boardcertified neurologist. All patients had undergone CT scan of the cervical spine that was interpreted by an attending radiologist. Patient data was stratified into 3 groups: Group I consisted of patients with radiculopathy (46 Male, 34 Female), Group II consisted of patients with myeloradiculopathy (24 Male, 12 Female) and Group III consisted of patients with myelopathy (9 Male, 3 Female). Results: Electromyography was abnormal in 74% in Group I, 62.8% in Group II and 33.3% in Group III. Median nerve SSEP was abnormal in 21% in Group I, 70% in Group II, and 75% in Group III. Posterior tibial nerve SSEP was abnormal in 15% in Group I, 80% in Group II and 82% in Group III. Conclusion: SSEP will confirm spinal cord dysfunction in majority of patients with spondylotic myelopathy with or without radiculopathy. While EMG/NCS confirms the presence of radiculopathy in a large number of patients with radiculopathy alone, SSEP shows evidence of myelopathy in approximately 21% of patients without clinical and radiological evidence of the same. Clinicians should suspect myelopathy in cases of cervical spondylosis and utilize SSEP to uncover cases of occult myelopathy prior to deciding definitive treatment.

Macrophage Migration Inhibitory Factor (MIF) as a Biomarker in the Assessment of Pulmonary Arterial Hypertension and Interstitial Lung Disease: A Preliminary Study. Kenneth Omonuwa MD, Talwar Arunabh MD, Maowen Hu MD, Xinchun Lin MD, Patricia Berkoski RRT, Sophy Dedopoulos ANP, Edmund J. Miller PhD; Division of Pulmonary, Critical Care & Sleep Medicine, Department of Medicine, North Shore University Hospital

Introduction: Macrophage migration inhibitory factor (MIF) has been well described as a pro-inflammatory cytokine and regulator of neuro-endocrine function. As lungs can synthesize and release MIF, we sought to investigate potential role of MIF as a biomarker in assessment of patients with pulmonary arterial hypertension (PAH) with and without interstitial lung disease (ILD). Methods: Study involved 20 patients; 9 with PAH {mean pulmonary artery pressure > 25mmHg and pulmonary capillary wedge pressure <18mmHg}, 5 with ILD, and 6 with PAH associated with ILD. Venous blood samples, drawn before and after exercise oximetry on treadmill were centrifuged, plasma separated and stored at -80°C for MIF analysis. The pre- and post exercise plasma MIF concentrations and percentage increases were then compared in the three subject groups with PAH, ILD, and PAH with ILD. Results: Significantly more MIF accumulated in plasma of patients with PAH associated with ILD following exercise (4.4 ± 2.8ng/ml) than in patients with ILD (1.4 ± 0.7 ng/ml) alone (p=0.04). While there was a wide variance in pre-exercise MIF plasma concentrations, the percentage increase in plasma MIF post-exercise was significantly greater (p=0.02) in patients with PAH associated with ILD (215.4 ± 223.5%) than in the presence of either single disease alone (PAH -19.1 ± 40.4; ILD 84.1 ± 103.0%). Conclusion: Our preliminary data show for the first time, the release of MIF in patients with PAH associated with ILD. In addition, our data are consistent with the lung as a source of MIF, a phenomenon only recently reported. While more patients are presently been recruited, our early findings however suggest that MIF may be, at the very least, a biomarker for the assessment of PAH associated with ILD.

Cryotherapy of the Nephrostomy Tract: A Novel Technique to Decrease the Risk of Hemorrhage After Percutaneous Renal Surgery. Arun K. Srinivasan MD, Louis R. Kavoussi MD MBA, Arthur D. Smith MD; Department of Urology, Long Island Jewish Medical Center

Introduction and Objective: Renal hemorrhage requiring transfusions and angioembolisation is a significant morbidity associated with complex percutaneous renal surgery. The aim of the present study was to compare in a prospective fashion cryoablation of the nephrostomy tract as compared with controls who had nephrostomy tube inserted after percutaneous renal surgery. Methods: Consecutive patients undergoing percutaneous nephrolithotomy, endopyelotomy or both, between May and Septmeber 2007, were included in the study. Control group had a 24French re-entry nephrostomy tube inserted. Study group had cryotherapy of the nephrostomy tract performed after antegrade insertion of 6F double J stent. Using a 2.4mm cryoprobe placed in the neprhostomy tract under fluoroscopy guidance,one 10-minute freeze-thaw cycle was performed. Peri-operative data and post-operative complications were collected for all patients. Data was analyzed using SPSS software. Results: 61 patients were included in this study; 31 in nephrostomy control group and 30 in the cryotherapy group. Isolated nephrolithotomy was the most common procedure performed in

both groups. Preoperative demographic and clinical variables were comparable between the two groups. Mean stone areas were 1540mm3 and 1553mm3 in the cryotherapy and control group, respectively. A third of patients in both groups had prior renal surgery. Mean number of dilated renal tracts was 1.86 in the cryotherapy group and 1.5 in control(p=0.02). Operative time was significantly longer in the cryotherapy group(123.9 vs 95.2 min, p=0.02). Post operative analgesic requirements and pain scale as measured by visual analog scale were not significantly different between the two groups. The cryotherapy group had significantly shorter hospital stay compared to control (2.1 vs 3.6 days, p=0.001). Delayed renal bleed requiring angioembolization was significantly less in the cryotherapy group (3% vs 13%, p=0.001, Odds ratio 0.23) Conclusions: Cryotherapy of nephrostomy tract is a novel technique that our present practice of inserting nephrostomy tubes. It significantly shortens the hospital stay after percutaneous renal surgery. This novel technique might have a significant role to play particularly after the more complicated percutaneous renal procedures for complex staghorns or combined procedures that require multiple tracts.

EDUCATIONAL OUTCOMES RESEARCH

Pulmonary Embolectomy: Appropriate Therapy for the Large, Central Embolus. Brian C. Fallon MD, L. Michael Graver, MD; Division of Cardiothoracic Surgery, Department of Surgery, Long Island Jewish Medical Center

Introduction: Pulmonary embolus continues to be a significant source of morbidity and mortality throughout the world. The amount of clot identified and hemodynamic parameters of the patient on presentation are used to guide therapy. Traditionally, systemic anticoagulation and thrombolysis have played important roles in treatment but are often not effective to significantly reduce large embolic loads and improve symptoms, particularly in unstable patients. Embolectomy via sternotomy or partial sternotomy provides an effective means to extract central clot and improve clinical symptoms. We describe our experience. Methods: Our data from 1996-2008 was reviewed for all patients undergoing pulmonary embolectomy. Indications included large central or saddle emboli, evidence of right ventricular dysfunction by echocardiogram, hypoxia, hemodynamic instability related to the embolus or contraindications to thrombolysis. In total 15 patients underwent 16 procedures. All were approached via a partial or full sternotomy and required a period of cardiopulmonary bypass. Several preoperative factors were analyzed including clot burden by CT scan, echocardiographic findings, age, etiology of DVT/PE and therapy initiated prior to embolectomy. Outcomes analysis looked at length of stay, postoperative mortality and follow up assessment. Results: From 1996-2008 16 embolectomies were done on 15 patients. The average age was 57 years, ranging from 22-81. Hospital stay averaged 6.3 days and follow up was nearly complete with one patient lost to follow up (94%). Of the 14 that were seen, all reported resolution of respiratory symptoms and return to normal activity by one month. There were no operative mortalities. Conclusion: Through analysis of our data we have shown that pulmonary embolectomy can be performed safely with reasonable length of hospital stay. When selected appropriately, we have shown these patients benefit significantly from this procedure and conclude that is should be offered to those that fit operative criteria.

Animated Biofeedback Compared to Non-Animated Biofeedback as an Educational Tool for the Treatment of Dysfunctional Voiding in the Pediatric Population. Jonathan D. Kaye MD, Lane S. Palmer MD; Department of Urology, Long Island Jewish Medical Center

Objective: Biofeedback is known to effect symptomatic and objective cure to children with dysfunctional voiding. While some authors advocate animation-assisted biofeedback as an educational tool, we previously demonstrated similar success without animation. We recently employed an animated biofeedback program aimed at teaching muscle isolation and encouraging patient interest. We compared the efficacy of biofeedback with and without animation as an educational tool to treat external sphincter overactivity (ESO) and its concomitant urinary symptoms. Materials and Methods: We compared our experience with the last 60 cases of biofeedback using electromyography (EMG) tracing alone (non-animated) with our first 60 cases using Laborie's Urostym Pediflow® animated program (animated). All 120 girls presented with urinary complaints and demonstrated ESO on EMG-uroflow. Post-void residual measurements were made by ultrasound. We compared the two groups with respect to time to resolution of symptoms and ESO, and improvement in post-void residual (PVR) volume before and after treatment. We also compare the cost of each modality. Results: The non-animated and the animated groups were comprised of girls of similar age (7.3 yrs. vs 6.9 yrs.). There was no significant difference between the two groups regarding symptom relief: daytime incontinence (90.9% vs 92.5% improvement), nocturnal enuresis (85.0% vs. 84.0% improvement), urgency (91.1% vs. 89.4% improvement), frequency (89.4% vs. 90.7% improvement), and hoarding (92.9 vs. 90.9% improvement). Three patients in each group experienced UTI post-treatment, compared to 42 and 41 pre-treatment in the non-animated and animated groups respectively. ESO resolved in 95% for both groups. PVR reduction was similar: from 35% to 9% of pre-void volume in the non-animated group, vs. from 28% to 8% in the animated group. Children in the animated biofeedback group achieved success in significantly fewer sessions (3 sessions) than children undergoing non-animated biofeedback (6 sessions) (p<0.05, t-test). This difference results in a 50% reduction in cost (\$654 vs. \$327). Conclusions: Despite our proven experience with non-animated biofeedback systems and our inexperience with an animated system, animated biofeedback systems yielded similar results in a significantly shorter time. Animation engaged the children, facilitating rapid muscle isolation, thereby promoting patient success. Both animated and non-animated biofeedback are efficacious teaching tools for the treatment of ESO and its symptoms.

A Multi-Step Approach to Reduce Errors in Pathology Specimen Handling and Processing. Keyur Patel MD, Yen Chen MD, Claudine Alexis MS ASCP NCA, Mike Ragnauth MT ASCP CLS QCy, Leonard Kahn MD, Tawfiqul Bhuiya MD; Department of Pathology, North Shore-Long Island Jewish Health System

Background: In recent years, medical errors and patient safety have become pressing national health care issues. We report a multiprong approach to prevent such errors and the outcome these measures in surgical pathology service. **Design:** A multidisciplinary committee performed a thorough analysis of the existing specimen handling process following JCAHO guidelines. Following are some of the major changes implemented to ensure patient identity at each step of specimen handling: • Additional space was added to the accessioning area to improve workflow. • Batch entry was abandoned mandating individual handling of each specimen. • Besides the surgical number, two unique patient identifiers (name and date of birth) have been added to cassettes.

• Cassette and slide labeling is now automated. • Each specimen is now placed in a separate plastic bin along with the requisition slip and cassettes. • Multiple patient identifiers are verified and dictated at the beginning of grossing. • High-risk cases (e.g. breast and prostate cores) are not handled back-to-back. • Pathologists receive one case per slide-tray. • Multiple monthly quality assurance

indicators have been introduced to monitor the effectiveness of the corrective actions.

• Identifying and analyzing any error, and sharing the lessons learned from the experience with peers at all levels.

• Continuous in-service education is given to the staff.

Results: Significant improvements were noted in quality control parameters compared between a 31-month period preceding and a 10-month period following implementation of the new specimen handling policy. Conclusions: Overall, the approach of maintaining the chain of patient identity at each step resulted in significant improvements. Specifically, non-batching, verification of multiple patient identifiers, physical separation of specimens and the culture of increased awareness have been particularly effective. The practice of proper specimen handling is being enforced with routine in-service education to eliminate the human error, still a significant risk factor despite marked improvement in the specimen handling process.

The Outcome of Cases with Acute Pancreatitis in a Single Center and a Comparison of Ranson's and SOFA Scoring System in Predicting Morbidity and Mortality. Ari Wiesen MD, Kostas Sideridis DO, Mirela Meca MD, Arkady Broder MD, Lenny Weinstein DO, Baez Mishiev MD, Prashun Jalal MD, Simmy Bank MD; Department of Medicine, Long Island Jewish Medical Center

Purpose: Acute pancreatitis is associated with considerable morbidity and mortality throughout the world. The mortality of acute pancreatitis is decreasing; this may be due to early recognition of the severity of illness based on various scoring systems. Identifying the severity of pancreatitis early is critical in order to institute the appropriate treatment strategies. This study evaluated cases admitted with acute pancreatitis and compared the Ranson's score to the Sepsis-related Organ Failure (SOFA) score in predicting outcomes. Methods: Data from consecutive patients admitted with an ICD-9 diagnosis of acute pancreatitis were analyzed retrospectively from 2001-2006. The primary outcomes were ICU admission and mortality. Secondary outcomes were development of pancreatic necrosis, pseudocyst, culture positive sepsis, hospital stay, and interventions required (e.g. ERCP and surgery). Ranson's and SOFA scores were calculated on admission and at 48 hours to predict the outcome parameters. Results: There were 250 patients diagnosed with acute pancreatitis during this period (136 males, 114 females median age 56 years). Etiologies identified: gallstones in 103(40%), alcohol in 84(34%), post-ERCP in 9(4%), hypertriglycerdemia in 5, and 53 cases were idiopathic. ICU admission was required in 53(22%) patients and 11 patients (3.6%) died. Pancreatic necrosis was seen in 24 (9.6%); pseudocyst developed in 11 cases (3 with necrosis). Culture positive sepsis was seen in 17 (5.2%). Endoscopic retrograde cholangiography was performed on 53 patients and 76 patients had a surgical intervention (necrosectomy/cholecystectomy). Hospital stay was 1-53 days (median 8 days). No difference was seen in predicting mortality by Ranson's or SOFA scores at admission. Patients with a SOFA score >3 were six times more likely to die compared to a score <3 (p<.005). SOFA scores at days 1 and 3 were superior to Ranson's score at admission and at 48 hrs for ICU admission(p<0.001 ppv 62%). SOFA score of >3 was significant for predicting necrosis(p<0.001) on admission, but not at 48 hours. Ranson's score predicted necrosis at 48 hours but not on admission (p<.001) Ranson or SOFA score >3 on admission was predicted LOS >7 days. At 48 hours an SOFA score >3 predicted an additional 10 days in the hospital(p<.02). At 48 hours an SOFA score >3 predicted hospitalization for another 10 days(p<02). Conclusions: Acute pancreatitis still has a very high morbidity and complications, but mortality has improved. Ranson's and SOFA scores are comparable in predicting mortality and necrosis, but SOFA score is superior in predicting ICU admission.

LITERATURE AND CLINICAL TOPIC REVIEWS

Dexmedetomidine as a Sedative Agent. Joanne B. Castaneda DDS, Christopher Page MD; Division of Oral & Maxillofacial Surgery, Department of Dental Medicine, Long Island Jewish Medical Center

Background: Dexmedetomidine (Precedex) is a specific stereoisomer of medetomidine, a highly selective α - 2 adrenergic agonist. α- 2 agonists act through the endogenous sleep-promoting pathways to produce a sedative-hypnotic effect. Dexmedetomidine has been shown not to cause respiratory depression and may decrease heart rate and cardiac output. It has been shown to have amnestic, analgesic, anxiolytic and antisialogogue effects. Dexmedetomidine is approved for only brief (<24 hours) postoperative sedation. It is not indicated for induction or maintenance of anesthesia. However, it has been used as an adjuvant during anesthesia to reduce the hypnotic and opioid requirements for conscious sedation. **Objective:** Review the literature that examines the use of the α -2 agonist dexmedetomidine as a sedative agent. Methods: A systematic literature review was performed that searched the PubMed database. The following keywords were searched: "dexmedetomidine and sedation". From 295 articles reviewed, 6 articles were chosen by their relevance to the objective. The articles were 2 clinical trials comparing dexmedetomidine to midazolam, 3 case reports (sum of 10 cases) using dexmedetomidine for difficult airways and 1 medical report. Findings: In the literature, dexmedetomidine was used for awake fiberoptic intubations for patients with compromised airways. These cases involved various patients with histories including traumatic injuries, complex anatomy, deviating masses, and complex medical histories. In all of these cases, dexmedetomidine was used to successfully sedate the patients. In Abdelmalak et al., 5/5 cases demonstrated that the use of the dexmedetomidine infusion helped to accomplish sedation and analgesia while keeping the patient responsive to commands and breathing satisfactorily. Dexmedetomidine also provided sedation with no additional local anesthesia/ blocks used. Other effects included none or minimal changes in respiration, antisialogogue properties, and negligible effects of hypotension and bradycardia. Cheung et al. found comparable sedation results using dexmedetomidine (77%) vs. midazolam (80%). According to Koroglu et al., dexmedetomidine achieved adequate sedation in more children undergoing magnetic resonance imaging compared to midazolam. Conclusion: The findings reviewed in this article suggest that dexmedetomidine could achieve successful sedation for difficult intubations and is also a comparable sedative agent to midazolam.

Interstitial Cystitis in Men: Diagnosis, Treatment, and Similarities to Chronic Prostatitis. Jonathan D. Kaye MD, Robert M. Moldwin MD; Department of Urology, Long Island Jewish Medical Center

Introduction: Largely a diagnosis of exclusion, interstitial cystitis (IC) is a clinical syndrome defined by chronic urinary urgency, frequency, hesitancy, and pelvic pain or discomfort in the absence of any other identifiable cause. Although IC is widely believed to be primarily a disorder of middle-aged women, increasing evidence has revealed its high prevalence among the male population as well. To our knowledge, the present paper is the first paper to review in a comprehensive manner all of the current literature specifically focusing on IC in the male population. Materials and Methods: An extensive Medline/PubMed search was performed for all publications in the English language literature on the subject of IC in men between January 1, 1970 and December 31, 2007. This paper explores the epidemiology, clinical manifestations, pathology, and treatments for interstitial cystitis with an emphasis upon the male patient. Overlapping clinical pathophysiology between IC and chronic prostatitis (CP), as well as its possible effects upon

patient management, will also be discussed. Results: Although IC can present at any age, it is most commonly diagnosed in the 3rd through 6th decades. Estimates of its prevalence range from 10 to 55 cases per 100,000. Men are thought to account for as few as 10% of these cases and as many as 30%. The true prevalence of IC in men may be significantly higher than 1-5 per 100,000 men when taking into consideration the general underdiagnosis of IC coupled with its clinical similarities to CP. While specific etiologies of IC remain matters of debate, autoimmunity, occult infection, and defective neuronal transmission are among the most tenable theories. Although no standard treatment regimen has yet been established, multimodal therapy is most successful, and may consist of behavioral, surgical, intravesical, and pharmacologic interventions. **Conclusions:** IC in men as a poorly understood and underdiagnosed, yet extremely important, clinical entity. Its prevalence, diagnosis, etiology, and treatment are the subjects of ongoing researching, which will hopefully continue to shed light on this debilitating disorder.

Cytokines in Pemphigus Vulgaris and Pemphigoid: Implications for Targeted Biotherapeutics. Jill M. Kramer DDS PhD; Department of Dental Medicine, Long Island Jewish Medical Center

Pemphigus vulgaris (PV) and pemphigoid (both cicatricial and bullous forms) are debilitating autoimmune diseases that pose significant therapeutic challenges. In PV and cicatricial pemphigoid (CP), the first symptoms frequently appear in or are limited to the oral cavity, whereas in bullous pemphigoid (BP) and PV the skin is often affected as well. Therefore, identification of these pathologies by the dental professional is often the first step in their diagnosis. Although PV and CP/BP have been recognized for decades, their etiologies are still not fully understood. Both diseases are driven by immune dysfunction, as specific B and T cells are identified in afflicted individuals that target antigens necessary for the maintenance of epithelial integrity. In addition, numerous inflammatory cytokines are elevated in both the sera and blister fluid of PV and CP/BP patients, suggesting that these cytokines may play a crucial role in the initiation and/or progression of these autoimmune dyscrasias. Importantly, the treatment of PV and CP/BP is non-specific immunosuppression, most commonly administered in the form of corticosteroids. While this therapeutic approach is usually effective in controlling disease, corticosteroids have significant negative side effects and are poorly tolerated by a significant number of patients. Therefore, there is a pressing need to identify novel therapeutics with greater biological specificity and less systemic toxicity. Recently, the management of several inflammatory diseases, including rheumatoid arthritis (RA) and psoriasis has been accomplished by therapeutic targeting of inflammatory cytokines. Many of these patients experience dramatic improvements in their quality of life; at levels not achievable with conventional systemic immunosuppression. Thus, the dramatic treatment success observed in patients with other autoimmune pathologies suggests that PV and CP/BP patients may benefit from a similar therapeutic approach. Thus, this review will discuss the contributions of B and T cells to the development of PV and CP/BP, while focusing on the presence of pro-inflammatory cytokines in the context of disease activity. Furthermore, it will detail the successes of anti-cytokine blockade in the treatment of autoimmunity, with specific emphasis on the applicability of this novel therapeutic approach for the treatment of PV and CP/BP.

Donor Site Issues/Complications with Osteochondral Autograft Transplants. Adam S. Levin MD, Michael Angel MD, Nicholas A. Sgaglione MD; Department of Orthopaedic Surgery, Long Island Jewish Medical Center

The treatment of osteochondral lesions of the weightbearing surfaces of the knee presents a significant therapeutic challenge. The difficulty in treating chondral lesions is due to its limited healing potential as a result of its avascularity, relatively low cell count, and the inherent limitations to cell migration within the extracellular matrix. While full-thickness defects violate the subchondral plate and evoke a healing response, the repair tissue is predominantly fibrocartilaginous, and the biomechanical and structural properties differ from those of native hyaline cartilage. Osteochondral autograft transplantation (OAT) was developed as a means of replacing the existing cartilaginous defect with viable articular cartilage, allowing the potential to integrate into the native cartilage structurally and biologically. The procedure is performed by harvesting autogenous osteochondral cylinders from a non-weightbearing portion of the knee and transferring them to the defect site. The current clinical results have made this an effective surgical solution to a particularly difficult surgical dilemma. While the procedure has tremendous potential, concern over donor site morbidity persists. The success of this operation requires an understanding of all of the biological, biomechanical, and surgical factors that go into successful graft harvesting and implantation. Though complications of the procedure at both the donor and recipient sites may be attributed to some intrinsic properties of the lesion itself, great efforts have focused on determining which factors are within the control of the treating surgeon. This paper is a comprehensive literature review of the issues regarding the use of osteochondral autograft transplantation as a method of treating chondral lesions. We first consider the biologic and biomechanical response of cartilage lesions and the implications of osteochondral transplantation on both donor and recipient sites. We then review the technical aspects and potential morbidities of the surgical procedure itself.

Pathophysiology of Spinal Cord Injury. Adam S. Levin MD, Michael Kessler MD, Kamal D. Dagly, MD, Jeff S. Silber, MD DC; Department of Orthopaedic Surgery, Long Island Jewish Medical Center

There are approximately 12,000 new cases of spinal cord injury reported annually in the United States and about 200-250,000 patients exist with various spinal cord injuries. Most involve males (82%) between 16 and 30 years of age and occur in the summer months on weekends involving motor vehicle accidents. Spinal cord injuries produce devastating disabilities for the individual, the family and society as a whole. Spinal cord injury produces a decreased quality of life as well as a tremendous public health impact with millions of dollars spent annually caring for these individuals along with lost productivity in this young affected population. Daily, we are gaining knowledge in the pathophysiology of the secondary mechanisms of injury and are developing interventions to either promote or diminish various cascades. Presently, there are no ideal or restorative treatments for patients suffering a spinal cord injury. There have been numerous cellular, molecular and rehabilitative strategies that have been utilized in animal and human studies with many of them reaching clinical trials. To date there is no one therapy in site that appears to be a panacea, but a combination of strategies may soon lead to better long-term functional outcomes for different types of spinal cord injury. This paper is a comprehensive review of the literature regarding the pathophysiology of spinal cord injury, including recent models to describe this complex cascade of events. We discuss the mechanism of neuronal death, as well as intrinsic attempts at repair and regeneration. Furthermore, we examine the current understanding of potential mediators and therapeutic modalities used in both the clinical and laboratory settings, and their prospective roles they may play in the future treatment of patients with spinal trauma.

Varenicline, an α4β2 Nicotinic Acetylcholine Receptor Partial Agonist, as Pharmacotherapy for Smoking Cessation. Jessica L. Manske DDS, Robert M. Moldwin MD; Department of Dental Medicine, Long Island Jewish Medical Center

Introduction: Tobacco is the agent most responsible for preventable disease and death in the United States. Pharmacologic treatment for tobacco users, combined with behavioral support, will help up to 25 percent of subjects remain abstinent from tobacco at one year after treatment. First line pharmacologic methods to reduce tobacco dependence include nicotine replacement therapy and bupropion, a dopamine reuptake inhibitor. The newest medication rapidly becoming accepted among this group is varenicline, an α4β2 nicotinic receptor agonist. Varenicline inhibits nicotine stimulation of dopamine receptors, and has been shown to decrease cravings and withdrawal symptoms. The efficacy of varenicline was compared to bupropion by reviewing randomized controlled trials which included both drugs. Methods: A literature search was performed using OVID Medline and PubMed search engines. Four randomized controlled trials testing efficacy of varenicline were reviewed. Three of the 4 studies compared varenicline to both bupropion efficacy and placebo, while one study compared varenicline to placebo only. Also regarded was a literature review and meta-analysis published by Wu et al in December 2006 comparing all pharmacologic types of smoking cessation therapies currently accepted by the United States Surgeon General. Results: Four week continuous abstinence rates were significantly higher for varenicline versus placebo. The three studies that compared varenicline to bupropion found significantly higher continuous quit rates for varenicline. A secondary measure of efficacy was 7 day quit rate, which also was found to be significantly higher for varenicline. The most common side effect of varenicline is nausea, and was found to be mild to moderate. Conclusion: Varenicline demonstrates both short-term and long-term efficacy in comparison to bupropion. This pharmacologic method for smoking cessation should be included in first line defense. Limitations to these studies include follow up ending at one year. In one maintenance study, as in all existing literature on smoking cessation with 1 year of follow-up, more than 50% of participants in each group returned to smoking. It is suggested that study of longer medication periods is warranted. In this case, adverse effects of longer term use must be analyzed.

Cerebral Palsy and Insufficient Treatment Modalities. Amy Mathew DMD; Division of General Dentistry, Department of Dental Medicine, Long Island Jewish Medical Center

Purpose: Cerebral palsy is a development disability that affects thousands of children every year. According to the NIH cerebral palsy is defined as, "is a group of disorders that involve loss of movement or loss of other nerve function." Generally cerebral palsy is characterized with uncontrolled movements. As a result of these uncontrolled movements and difficulty with tonicity, patients' oral health is often highly affected. Some of the oral health concerns that predominate the cerebral palsy population include: periodontal disease, malocclusion, TMJ disease, dental caries, dysphasia, bruxism, drooling, trauma, and enamel defects. These oral health concerns can be addressed via regular check ups with the patients' dentist. The dentist has a key role in ensuring optimal health of cerebral palsy patients. The purpose of this paper is to examine the role of the dentist in relation to treatment modalities. Methods: A MEDLINE search of English literature utilizing PubMed from 1998 till present. The key words included: "cerebral", "palsy", "dentistry", "dental", and "dentist". Results: After a thorough search, minimal results were found. It appears that not many studies have been completed on the treatment of cerebral palsy patients' and dental treatment modalities. It appears as if this disability has not been thoroughly studied from a dental perspective. Several of the results included cerebral palsy along with other developmental disabilities and the prevalence of various oral issues. However, the method to best treat cerebral palsy patient by the dentist was not and could not be found. Conclusions: Dentists must be further informed of various treatment modalities of cerebral palsy patients to enhance and optimize the oral health of cerebral palsy patients. With increased knowledge regarding treatment modalities of cerebral palsy patients, dentists can be trained to serve this aspect of our population. Oral health is a key aspect of an individuals' oral health and cerebral palsy patients must be better served by the dental professional.

Minimally Invasive Dentistry. Jacob Milunsky DMD; Division of General Dentistry, Department of Dental Medicine, Long Island Jewish Medical Center

Introduction: Minimally invasive dentistry defines a modern approach to treating dental lesions without removing excessive tooth structure. A culmination of data gathering, material advances and biological research has made such approaches to restorative dentistry feasible. Methods: The benefit to the patient exists in retaining as much of their naturally present and healthy tooth structure for as long as possible, decreasing the need for full coverage restorations, or extractions. The preservation of the original and organic dentition decreases the probability of functional rejection or iatrogenic damage. Previously, the principals of G.V. Black's preparation designs for the retention of amalgam restorations required significant removal of healthy structure on teeth, often extending beyond the outermost progression of the decayed lesion. Adhesive restorative materials do not require the same degree of mechanical retention as conventional restorations. Additionally, research into the cellular progression of caries indicates that remineralization can be utilized to return the affected layers of dentin to cariogenically stable tooth structure. Fluoridation in water and through supplements is a critical element of the chemical remineralization process. Results: Studies have shown that when used appropriately, diagnostic and restorative methods of minimally invasive dentistry generate acceptable restorations while preserving much greater amounts of natural tooth structure. Conclusions: The advent of modern restorative techniques requires a practitioner to understand the data presented both by the diagnostic and clinical treatment techniques. Understanding this new modality of treatment can add a new and less invasive approach for smaller lesions. Not all situations warrant this form of treatment, but knowledge of its value is essential. The Effects of Work-Hours Reform on the Operative Experience of General Surgery Residents. The T. Phan DDS, Francis S. Stellaccio MD; Division of Oral & Maxillofacial Surgery, Department of Dental Medicine, Long Island Jewish Medical Center

Purpose: To assess the effects of work hours reform on the operative experience of general surgery residents. Methods: A Pubmed search was performed. Articles containing data of resident's operative volume before and after implementation of work hours reform were reviewed. In order to obtain direct comparisons, only articles with data from a single institution were included. Results: A total of six articles fulfilled the inclusion criteria. All six articles provided data showing changes in operative volume after work hours reform according to PGY level. (One article provided data only for PGY5s) PGY5s: 5 articles noted a decline in the number of operative cases, 1 article showed an increase. PGY4s: 2 articles showed a decline the number of operative cases, 2 articles showed an increase. PGY2s: 2 articles showed a decline the number of operative cases, 3 articles showed an increase. PGY1s: 3 articles showed a decline the number of operative cases, 1 article showed an increase, and 1 article showed no changes. Conclusions: There is no clear evidence to whether work hours reform have increased or decreased the operative volume of surgery residents. Reliable reporting methods and compliance to work hours must be established first in order to accurately evaluate for any changes. With that being said, conclusive evidence would require comparing data from residents graduating before 2003 with residents graduating in 2008.

Clinical Performance of Chairside CAD/CAM Restorations.

Jin Yoo DDS; Division of General Dentistry, Department of Dental Medicine, Long Island Jewish Medical Center

Purpose: The application of computer-aided design/ computer-aided manufacturing (CAD/CAM) technology in dentistry is having a profound effect on both dental laboratories and clinics. The CEREC system (Sirona Dental Systems GmbH, Bensheim, Germany) is a chairside application of CAD/CAM technology for restorative dentistry that is marking its 20th year of clinical service. Dentists have expressed a number of concerns about CEREC-generated restorations since their introduction. The CAM process elicited obvious concerns about the adaptation and marginal fit of the milled restoration. The adhesively cemented ceramic materials used in CERECgenerated restorations raised concerns about fracture resistance, durability and clinical longevity. Clinical research has been published that documents the effectiveness of the CEREC system Methods: The author identified and reviewed clinical studies from 1985 through 2006 that included CEREC-generated inlays, onlays or crowns. These studies were conducted in both private practice and university settings. The author summarized the findings as they relate to postoperative sensitivity, restoration fracture, color match, margin adaptation and clinical longevity. Results: Although postoperative sensitivity was reported, it was due to mainly occlusal interferences. Long-term postoperative sensitivity was not a reported problem. Similar to other ceramic restorations, restoration fracture is the primary mode of failure for CEREC-generated restorations. Although margin wear is detected consistently, consequences of the wear leading to restoration failure were reported rarely. The survival probability of CEREC-generated restorations was reported to be approximately 97 percent for five years and 90 percent for 10 years. Conclusion: The low rate of restoration fracture and long-term clinical survivability document the effectiveness of the CEREC system as a dependable, esthetic restorative option for patients.

NURSING AND ALLIED HEALTH

Moral Distress in Registered Nurses Working in Hospital Inpatient Settings. Terri A. Cavaliere MS RN NNP-BC, Susan Buchholtz Ed.D RN ANP-C, Ani Jacob MS RNC, Joanne Turnier, MSN, RNC, CNS; Division of Neonatal-Perinatal Medicine, Department of Pediatrics, North Shore University Hospital

Introduction: Moral distress is a pervasive, but seldom acknowledged, problem impeding the ability of nurses to deliver optimal health care. Moral distress contributes to job dissatisfaction, burnout, resignations, and abandonment of the profession. There are limited data available using the Moral Distress Scale. The specific aims of this cross-sectional study of moral distress in registered nurses were (1) to assess the level, frequency, and nature of moral distress and (2) to test the hypothesis that registered nurses practicing in critical care units (MICU, CCU) experience a higher level of moral distress than those practicing in sub-acute inpatient settings. Methods: Participants, recruited from the nursing staff of the adult inpatient units at North Shore University Hospital, were asked to complete a written 3-page Moral Distress Scale and demographic data sheet. The study was anonymous and voluntary. A convenience sample of 220 registered nurses was utilized. Results: Participants acknowledged a moderate amount of moral distress. The level of moral distress was significantly correlated with the type of nursing unit; nurses in the critical care units had higher levels of moral distress than those practicing in sub-acute settings. Twenty seven percent of the participants revealed that they would consider leaving their present positions because of moral distress and several comment that this distress may lead to their leaving their present positions. It appears that support and education regarding moral distress for the nursing staff is needed.

Analysis of Patients Response to Selective Internal Radiation Therapy at Long Island Jewish Medical Center. Doreen Donovan RN-C FNP-C; Department of Radiology, Long Island Jewish Medical Center

Purpose: Primary and metastatic solid tumors of the liver represent the most challenging and, unfortunately, most fatal situations in oncology. In May, 2007, Long Island Jewish Medical Center became one of only two hospitals in New York State to offer selective internal radiation treatment (SIRT), which emerged as a new treatment option for patients with non-resectable liver tumors. SIRT using yttrium (Y-90) microspheres infused through the hepatic circulation allows for the delivery of high radiation doses to all liver tumors while maintaining a low radiation dose to normal hepatic parenchyma. No literature to date reviews the patient's post procedure response to SIRT at LIJ Medical Center. Methods: A retrospective chart review was performed on patients who had undergone SIRT at Long Island Jewish Medical Center between May, 2007 and November, 2007. Disease status, liver function, toxicity, response, and survival rates were measured on post procedure day one and day fourteen. For those available, 3 month follow up PET/CT scan results were reviewed. Data was collected by a single reviewer in a standardized format. Results: Seven patients were identified, one treated twice (n=8). The mean age 61.8, (51-73 years) 62% were male; (6/7) 88% had metastatic liver cancer, (1/7) 14% with cholangiocarinoma. Day one (8/8)100% of patients stated felt well; (3/8) 37.5% with grade 1 toxicity, including mild fatigue and abdominal tenderness. Day 14, (5/8) 62.5% experienced transient grade 2 toxicity, consisting of mild RUQ pain, loss of appetite, and fatigue. Of the 2 patients employed, both resumed work within one week. Three month follow up PET/ CT scan, (4/4)100% showed tumor stabilization, (3/4) 75% demonstrated tumor necrosis and decreased hypermetabolic tumor volume. The remaining three patients had recent treatment and did not have a repeat scan. Over one month post procedure, one patient developed liver failure due to progression of disease and expired; (6/7) 85.7% survival rate. Conclusions: SIRT has demonstrated promising efficacy and acceptable toxicity, with rare serious side effects. SIRT offers the potential to extend patients survival, while maintaining a good quality of life. Further evaluation of SIRT in other oncological settings is warranted.

Childhood Acute Lymphocytic Leukemia: A Cytogenetic and FISH Perspective. Tamara K. Jansz, MT(ASCP) BS; Division of Cytogenetics, Department of Laboratory Medicine, Long Island Jewish Medical Center

Acute Lymphocytic leukemia (ALL), the most common form of cancer in children has become an important area of research and clinical study. Clonal proliferation of these hematopoetic cells is often the result of genetic abnormalities. It is known that the molecular presentation of such abnormalities, frequently chromosomal translocations, has a strong correlation to both the mechanism and prognosis of ALL treatment. The purpose of this study is to reaffirm the validity of key genetic correlations from the commonly accepted research texts of Heim and Mitelman, and additionally analyze clinical data for yearly, regional, gender, and chromosomal abnormality trends. The information gathered from this study of ALL prevalence will be used as a means of describing and characterizing the patient community served by the Long Island Jewish Medical Center (LIJ). A 25 month study (January 2006-January 2008) including 64 pediatric patients with ages ranging from 1-20 was conducted. All patients selected for the study were new evaluations for varying stages of B-cell and T-cell Acute Lymphocytic Leukemia. Chromosome analysis of 20 Trypsin-Geimsa (GTG)

banded metaphase spread from direct and 24hr bone marrow analysis was performed. Fluorescence In Situ Hybridization (FISH) was also performed on selected patients using LSI BCR/ABL, TEL/AML1, MLL, 4, 5, 7, 8,9,10,17 and inv (16) probes (Abbott Molecular, Des Plaines, IL). Of the 64 patients studied 26 (40.6%) had karyotypes and FISH analysis indicating a hyperdiploid state (with additional 4, 8, 9,10, 12,17, 21, 22 or sex chromosomes). Ten out of 64 patients (15.6%) revealed abnormal translocations or rearrangements in either BCR/ABL, TEL/AML1 or MLL. The t(1;19) was seen in 5 out of 64 (7.8%) patients. In the 64 patients studied, 13 other significant translocations were seen (20%). Eight other deletions in numerous chromosomes were also observed in the 64 patients studied (12.5%). Other significant chromosomal abnormalities were seen in four out of 64 patients (6.25%). Sixteen patients studied expressed normal karyotypes (25%). Regional analysis of positive patients revealed increased presentation in Queens, Nassau, Suffolk, Bronx and Brooklyn in descending order of prevalence. As expected our community data correlated well with the predicted trends of the researched texts of Heim and Mitelman. However, even considering the closeness at which the results of this study mirrored the key trends in the research text, measuring success in characterizing the pediatric ALL patient community of LIJ was difficult, and may require additional data beyond the scope of this study. The data collected revealed some significant regional trends with Queens and Nassau, NY as giving rise to the most pediatric patients presenting with ALL. This study also raised interesting perspectives for future analysis and further emphasized the significant contributions made through genetic analysis on the diagnosis and treatment outcomes of childhood acute lymphocytic leukemia.

Functional Home Circuit Training in an 88 Year Old Female with COPD. Maureen Loyal PT DPT; Department of Physical Therapy, Plainview Hospital

Background and Purpose: This case report describes a functionally based home-based physical therapy program for an 88 year old female with chronic obstructive pulmonary disease (COPD). The intervention's goal was to increase the patient's tolerance to activity, decrease her risk for falls and improve her functional testing scores by performing task specific activities. Case Description: Assessment of the patient demonstrated initial functional testing scores below norms for her gender and age range. An 8-week functional home circuit training program was initiated based on task specific activities of daily living and performed as tolerated by the patient. Outcomes Improvements were noted on all functional testing, and in the patient's ability to tolerate activity. Discussion: Research studies indicate that older adults are able to achieve strength gains, however, these studies recommend that the training programs should resemble task specific activities to optimize carry over of these strength gains to functional tasks. In this case report, a functionally based home exercise program was able to increase functional testing scores in the patient.

Meeting the Needs of Today's Learner: A New Paradigm in RN Orientation. Irene Macyk MS APRN BC CNS; Department of Nursing Education, Schneider Children's Hospital

Introduction: In light of a looming long term predicted nursing shortage, new graduate nurses are being hired in large numbers to fill the increasing number of vacant positions in hospitals. The education received by the students is limited in providing the clinical training needed to care for high acuity, very specialized patients seen in tertiary care pediatric hospitals. Literature on turnover rates of new graduate nurses in acute care pediatric hospitals have been reported as high as 32% in the first 12 months. This has substantial financial impact. A nurse of less than one year employment who terminates represents a \$50,000 to \$110,000 loss for the institution. New evidence has emerged that advocate for training programs that integrate a scenario based, simulation focused process and cite a 34% increase in 12 month retention rate. The purpose of this study was to determine if a redesigned RN orientation program using case scenarios and simulation training would increase RN satisfaction with orientation. Methods: A comparative analysis of satisfaction with orientation for new graduate RN's hired to a Children's Hospital on Long Island NY was conducted on a convenience sample of RN's recently off orientation, prior to and after implemenation of a restructured orientation program. 19 nurses were surveyed, from the 6 month period prior to a new process and compared to 18 RN's hired in the 6 months after initiaition. Didactic learning was provided via e-learning modules and class time spent doing scenario enactments and simulation using manniquins. A questionaire was administered to each group. A 5 point likert scale was used. One questions' responses were used in the comparative analysis: My overall impression of RN orientation was: 1 Poor 2 Fair 3 Good 4 Very Good 5 Excellent. Results: The results demonstrated an improvement in participant satisfaction with orientation from 3.9 to 4.3 on a 5 point likert scale. Conclusions: Results demonstrate that new graduate RN's in a tertialy care children's hospital prefer an approach to orientation that encorporates simulation and clinical scenarios. Orientation will continue to be refined to better meet the needs of todays learner.

Neonatal Torsion: Review of the Literature and Current Recommendations. Patrick Marrone R-PA/C, Jonathan D. Kaye MD, Lane S. Palmer MD, Department of Urology, Schneider Children's Hospital

Introduction: Neonatal testicular torsion is a rare but important clinical entity whose etiology and risk factors remain matters of debate. Management of this problem is also controversial, as the likelihood of testicular salvage and metachronous contralateral torsion must be weighed against the risk of neonatal anesthesia.

Methods: We reviewed the current literature, as well as the classic and original papers, on this topic. The epidemiology, proposed etiologies, diagnostic modalities, and management recommendations based upon large series, expert opinions, and our own experience, are discussed. Results: Whether one side is more likely than the other to torse is unclear based upon the literature. Approximately 20% are bilateral. Roughly 70% occur prenatally, with the remaining 30% occurring in the first 30 days of life. Most, but not all, neonatal torsions are extra-vaginal. Complicated pregnancy, traumatic delivery, and large birth weight seem to predispose to torsion. Doppler ultrasound and nuclear scan are of limited utility in the diagnosis of this disorder; history and physical exam remain the keys to proper diagnosis. When neonatal torsions are stratified into prenatal and postnatal (which few series do), it appears that these are two different entities with different management and outcomes: prenatal torsions are never salvageable and therefore need not be explored emergently, though contralateral orchidopexy is advisable. Postnatal torsions, on the other hand, are salvageable 10-40% of the time, and should therefore be explored emergently. Bilateral torsions should undergo emergent management. The anesthetic risk to the neonate in all series was negligible, but must nonetheless enter the calculus in determination of management. Conclusions: Neonatal torsion is an important urologic problem whose etiologies and management remain matters of controversy. However, as more and larger series are published in the urologic literature, this entity can be studied and approached clinically in an evidence-based manner.

Assessment of Health Promoting Lifestyle Behaviors in Nurses. Deborah McElligott NP; Administration, North Shore University Hospital

Purpose/Objective: This purpose of the pilot study was to examine the wellness behaviors of nurses in the acute care setting. Background: Watson's Theory of Caring supports Nursing's focus on self-care in the creation of healing environments. As current statistics identify a nursing shortage and an aging population, the wellness of existing staff becomes paramount. **Methods:** An anonymous, convenience sample of cardiac and neuroscience nurses in a tertiary care hospital was used in the study. The Health Promoting Lifestyle Profile II Assessment Tool was sent to 500 eligible subjects with a 30 % return rate. This self-administered questionnaire examined wellness using six subscales (52 questions): nutrition, stress, spirituality, health responsibility, interpersonal relations, physical activity. Participants (N=149) selected one of four answer choices, (1 = never, 2 = sometimes, 3 = often, 4 = routinely). Scores were totaled in each of the six subscales. Means were calculated and analyzed between units and demographic factors using two-way analysis of variance (ANOVA). Lowest scores indicate area of weakness. **Results:** Lowest scores occurred in interpersonal relationships and spirituality. There was no significant difference between units or demographics (age, race, years in nursing, education, gender). **Discussion:** The lower scores indicate staff would benefit from holistic nursing programs focused on stress reduction and physical activity. High scores are supportive of group work and the creation of healing environments.**Conclusions:** This pilot study provides evidence to support the need to incorporate holistic philosophy and life stage theories into nursing practice at our institution.

Medical Errors: Human Factors Training and Near Miss Reporting Through Culture Change. Martha Nicholson RN MPA CPHQ; Department of Perioperative Services, North Shore University Hospital

This paper discusses two pertinent case studies of significant medical errors that resulted in the death of the patients from flawed health care systems. The first case study was the death of a 7 year old boy who died shortly after he was injected with epinephrine with a concentration of 1:1000 instead of 1% lidocaine with a concentration of 1:100,000. The second case study describes an incident where five nurses inadvertently gave adult doses of heparin, a blood thinner, to six infants where three died. The increased awareness of medical errors brought about through the Institute of Medicine (IOM) who released a report, *To Err Is Human—Building a Safer Health System (Kohn, Corrigan, & Donaldson, 2000)* that has prompted federal, state, public and private to implement new initiatives for patient safety. The government has promoted the need for health care to undertake more initiates towards creating a safe place for patients. The purpose of this paper is to identify what is preventing hospitals from creating patient safety programs and what have other industries done that can be used in healthcare. The results are that new programs are being developed in healthcare institutions to promote patient safety. Several initiatives are discussed in this paper. Some examples are crew resource management, adopted from the airline industry and are being adapted to healthcare to prevent errors in operating rooms. A second pro-active approach discusses a near miss program for identifying issues leading up to an error before it occurs. Establishing these types of systems is a beginning step to promoting patient safety.

Case Study of Projective Identification as a Transformative Tool in Treatment. Romaine Stanger LCSW; Department of Psychiatry, North Shore University Hospital.

In this case I will explore how the use of projective identification facilitated the process of change in therapy. The History of projective identification involves understanding Freud's use of projection as a defense and Melanie Klein's use of projective identification as a primitive defense and form of communication in object relations.

In the Case History. Mark Smith a 36 year old man struggles with issues of identity, recovery for alcohol dependence and a borderline personality disorder. His pattern of projecting negative and passive material onto the therapist is seen as a form of communicating his own passivity in the world and helplessness and also a defense against disappointment hurt and also his own rage. Through projective identification and the containment by the therapist, Mark seems to have a clearer understanding of his unconscious process and is using this to make changes in his daily life. Conclusion suggests analytic methods such as projective identification are useful in helping the patient deal with daily life stressors and develop ego integration. This is pertinent in the current clinical environment where focus on behavioral goals and instruction to patients can often bypass unconscious mechanisms in the process of therapeutic therapy.