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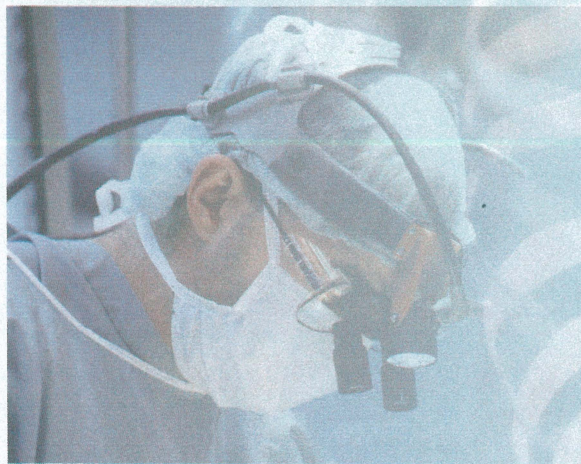
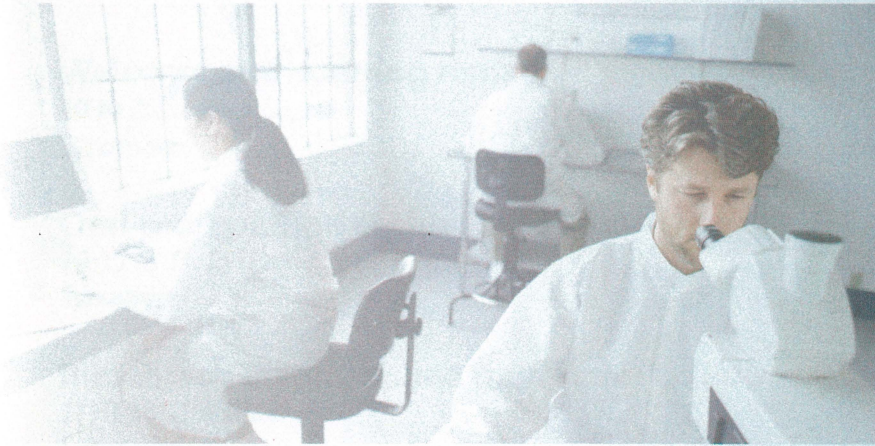
Advocate Health - Midwest

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Scientific Day

2 0 0 9 p r o g r a m

Thursday, May 28 • 10 a.m. to 4:45 p.m. • Aurora Conference Center



Scientific Day



Thursday, May 28, 2009

10 to 4:45 p.m.

Welcome and opening remarks

10 to 10:15 a.m.

Sycamore

Oral presentation session I

10:15 to 11:15 a.m.

Sycamore

Rieselbach distinguished paper presentation I

11:15 to 11:45 a.m.

Sycamore

Lunch break

11:45 a.m. to 12:15 p.m.

Sycamore

Poster session/viewing and judging

12:15 to 1:45 p.m.

Ash & Buckeye I Rooms

Oral presentation session II

1:45 to 2:45 p.m.

Sycamore

Oral presentation session III

2:55 to 3:40 p.m.

Sycamore

Rieselbach distinguished paper presentation II

3:45 to 4:15 p.m.

Sycamore

Awards immediately following

Aurora Scientific Day is open to all resident/fellow physicians, students, teaching faculty and allied health professionals at Aurora Health Care.

Oral Presentation – Session I

Automatic respiration motion compensation in CT-fluoroscopy image fusion

Krum D, M.S., *Electrophysiology Research, Aurora St. Luke's Medical Center*

Soubelet E, Ph.D., *GE Healthcare*

Varray F, Ph.D., *GE Healthcare*

Hare J, B.S., *Electrophysiology Research, Aurora St. Luke's Medical Center*

Sra J, M.D., *Department of Electrophysiology, Aurora St. Luke's Medical Center*

Background/ significance:

Cardiac motion due to respiration may affect the accuracy of image integration. We have developed an image processing algorithm to compensate for this motion that automatically adjusts the position of the 3D volume from CT with respect to incoming fluoro images during respiration.

Purpose:

In the present study we show results of a two step validation procedure used to assess the performance of this respiration-tracking algorithm.

Methods:

A database was created by recording a series of 25 ECG-gated fluoro image sequences from 17 patients undergoing AF ablation. In the first step of the validation procedure, a mathematical evaluation of the algorithm was conducted. The location of a catheter positioned close to the ostium of the superior pulmonary veins was marked on each of the fluoroscopic images throughout at least two full respiratory cycles. The motion of this catheter represented a reference for respiratory motion. The algorithm was applied to each of the sequences in the database. The result of the tracking algorithm was automatically computed and then categorized as good, fair or poor based on the absolute difference in pixels between it and the reference. In the second step of the validation procedure, the same series of fluoro sequences was registered with their corresponding left atrial CT image, and motion of the left atrium throughout the respiratory cycle was tracked using the respiration-tracking algorithm. The accuracy of respiration motion tracking was evaluated clinically by four experienced operators and rated as good, fair or poor based on relative motion between the fused CT image and catheters within the left atrium.

Results:

In step one, 504 images from the database were evaluated. The tracking algorithm was good in 72% of the cases, fair for 24%, and poor in 4%. The clinical evaluation rated 69% as good, 29% as fair, and 2% as poor. A Chi square test between results of mathematical and clinical evaluation (Chi square = 25, $p = 0$) demonstrated that the percentage in each category is similar between the two evaluation techniques.

Conclusion:

Performance of the respiration-tracking algorithm is valid for CT-Fluoro fusion. Further evaluation for clinical use is warranted.

Stent fracture-associated restenosis in bare-metal stents compared with drug-eluting stents

Pienkos P, M.D., Department of Cardiology, Aurora Sinai Medical Center

Nfor T, M.D., Department of Internal Medicine, Aurora Sinai Medical Center

Akhtar M, M.D., Department of Cardiology, Aurora Sinai Medical Center

Allaqaband S, M.D., Department of Cardiology, Aurora Sinai Medical Center

Bajwa T, M.D., Department of Cardiology, Aurora Sinai Medical Center

Background/ significance:

Stent fracture has been increasingly identified in patients found to have angiographic in-stent restenosis in drug-eluting stents (DES). However, association between stent fractures and in-stent restenosis in bare-metal stents (BMS) is unknown.

Purpose:

To determine significance of stent design type and drug-coating variables in particular, we compared stent fracture rates in BMS and DES.

Methods:

We identified 1,040 patients who underwent repeat catheterization between January 2006 and December 2007 because of acute coronary syndrome or positive functional test. Of these patients, 310 patients were noted to have evidence of angiographic in-stent restenosis. These films were independently reviewed by two experienced interventional cardiologists and 62 stent fractures were identified. Fracture rates were compared between BMS, paclitaxel-eluting (PES), and sirolimus-eluting (SES) stents.

Results:

Sixty-two stent fractures were identified: fracture incidence in BMS was 11/1,561 (0.7%), PES 16/998 (1.6%), and SES 35/1,208 (2.8%). Fracture rate was significantly lower in BMS than DES [$p = 0.0001$, CI 3.28 (1.72 - 6.24)], and also when compared with either SES [p value < 0.0001 , CI 4.11 (2.11 - 8.03)], or PES [$p = 0.046$, CI 2.26 (1.07-4.84)]. Fracture rate was significantly lower with open-cell design (BMS + PES) compared with close-cell design (SES) [$p < 0.0001$, CI 2.75 (1.66 - 4.53)]. Additionally, fracture rate trended towards being lower in PES compared with SES [$p = 0.063$, CI 1.81 (1.00 - 3.26)].

Conclusion:

Stent fracture-associated restenosis with BMS occurs significantly less frequently than with DES. Also, stent fracture-associated restenosis occurs significantly less frequently with open-cell stent versus closed-cell design. Stent design and coating are significant variables in likelihood of subsequent stent fracture.

Prevalence of periodic fever, aphthous stomatitis, pharyngitis and cervical adenitis syndrome (PFAPA): eastern Wisconsin

Ranade M, University of Wisconsin School of Medicine and Public Health

Baumgardner D, M.D., Department of Family Medicine, Aurora UW Medical Group, Center for Urban Population Health, Aurora Sinai Medical Center

Banerjee I, Center for Urban Population Health, Aurora Sinai Medical Center

Doniparthi M, Arrowhead High School

Background/ significance:

PFAPA Syndrome is often overlooked as a single entity, resulting in unnecessary antibiotic prescription. The disorder may be more heterogeneous than previously recognized. Thought to be rare, the true prevalence rate is unknown.

Purpose:

This study explored the prevalence and features of PFAPA in a community population.

Methods:

Retrospective electronic chart review of children seen in a large eastern Wisconsin integrated health system, 2002-2007, with diagnosis of stomatitis (ICD-9 codes 528.0, 528.2). Aphthous Stomatitis (AS) syndromes were enumerated and demographic, clinical and treatment histories were compared utilizing chi-squared test for categorical variables and Mann-Whitney test for non-normal continuous variables.

Results:

Review of 949 records revealed 353 cases of apparent AS, of which 47 (13%) were documented to be recurrent (at least two episodes in one year), significantly lower than 50% as reported in current literature. Only two (0.6%) were PFAPA. There was a trend toward recurrent cases being more commonly male (60% [versus 40% non-recurrent], $p = 0.08$); otherwise they did not differ from non-recurrent cases by age, race or specialty of diagnosing clinician; or presence of fever, cervical adenopathy or pharyngitis at the time of visit. Antibiotics were prescribed in 4% of all AS cases without other diagnosis.

Conclusion:

PFAPA Syndrome appears to be rare in a community population. The recurrent nature of AS appears to be poorly documented, but does not contribute significantly to inappropriate antibiotic prescription.

Quality improvement of blood pressure (BP) measurement

Caceres A, M.D., Department of Internal Medicine, Aurora Sinai Medical Center

Dalmar A, M.D. Aurora Sinai Medical Center

Grim C, M.D., Medical College of Wisconsin

Grim C, R.N.

Background/ significance:

BP control is increasingly used as a quality indicator, but its reliability and reproducibility are seldom taken into account.

Purpose:

The purpose of this study is to improve the accuracy of blood pressure measurement in a primary care clinic setting. For any quality improvement project to work, there needs to be reliable and reproducible measurement, we found great variability and biases which could be corrected by training.

Methods:

We measured terminal digits (TD) preference of BP readings performed by clinic staff for the last three months, then staff underwent training consisting of video describing proper techniques for obtaining BP, demonstrations, return demonstrations by BP observers of proper BP obtaining techniques and certification. Again we measured BP readings for the three months following training.

Results:

Our result is based on 2,305 Systolic and Diastolic BP readings before the training and 2,555 Systolic and Diastolic BP readings after the training. The result shows that the training eliminates or decreases terminal digit biases. For instance in the study TD preference for zero among SBP and DBP decreased from very minimal standard (57%) before training to optimal (16%) after training. The result also shows a difference in mean BP (higher after training), but the percentage of persons with high blood pressure were higher in the before group; that means there could be an over estimation of high blood pressure rate in this group.

Conclusion:

Marked inaccuracies in BP measurement in primary care clinic can be seen by terminal digit bias analysis. Terminal digit biases analysis can be used as a quality indicator. Measurement can be improved through training.

Rieselbach Distinguished Paper



Richard E. Rieselbach, M.D.
Associate Dean and Chairman
Department of Medicine
University of Wisconsin Medical School
Milwaukee Clinical Campus
1974-1991

Born in Milwaukee, educated at the University of Wisconsin Madison and Harvard Medical School, trained in Internal Medicine at the University of Illinois and nephrology at Washington University in St. Louis, Dr. Rieselbach has been a faculty member of the University of Wisconsin Medical School since 1965.

Dr. Rieselbach provided the inspiration and administrative leadership which created the Milwaukee Clinical Campus at Mount Sinai Hospital in 1974. He shepherded its growth from the initial 46 faculty (full-time and clinical) and 18 residents/fellows, to 90 full-time faculty, 158 clinical faculty, and 108 residents/fellows in six departments by 1991.

His high standards for clinical and academic excellence fostered the recruitment of leaders and the development of innovative programs in primary care, geriatrics, interventional cardiology and electro-physiology, and high risk obstetrics which came to characterize the campus. He maintained a strong commitment to care of the medically indigent, fostering an expectation of community service in faculty and students. He projected a national vision in progressive reform of medical education and health care delivery.

Rieselbach Distinguished Paper – Session I

Geographic distribution of human and dog blastomycosis by season in northern Wisconsin

Baumgardner DJ, M.D., *Department of Family Medicine, Aurora UW Medical Group, Center for Urban Population Health*

Baeseman ZJ, M.D., *University of Wisconsin Madison*

Schreiber A, M.A., *Center for Urban Population Health, Aurora Sinai Medical Center*

Paretsky DP, D.V.M., *Eagle River Animal Hospital*

Vilas County Health Department

Background/ significance:

Blastomycosis is a potentially fatal systemic and cutaneous fungal infection that is contracted by inhalation of spores from an incompletely defined ecological niche. Previous studies have not conclusively demonstrated seasonality for blastomycosis. Seasonality might suggest certain environmental factors.

Purpose:

Perform a retrospective analysis to determine if there is a non-random distribution of human and dog blastomycosis cases, generally and geographically by season, and over time in a highly endemic area.

Methods:

Retrospective case study. Street addresses and demographic data from a human mandatory report registry of cases in or adjacent to Vilas County from 1979 to 2006 (N = 174), were geocoded with Map Marker Plus and were mapped using Arc-GIS. CrimeStat III was used for spatial modeling, including mapping of ratio of case/control densities. Controls were 200 random-number selected households from 2001 County tax records. A chi-squared test was used for categorical data, and Mood's Median Test was performed on the geographic distribution data. An individual/moving range control chart was constructed for County cases from 1984 to 2006. A similar analysis was performed on a registry of dog cases from a single veterinary practice from 1990 to 2008 (N = 219); controls were 200 random-number selected addresses from the 2001 practice registry.

Results:

The distribution of human cases, winter (N = 47), spring (42), summer (45) and fall (40), was not statistically significant (P = 0.9), based on symptom onset; and was borderline significant for dogs (P = 0.06), winter (N = 53), spring (39), summer (79), fall (48). The geographic distribution of human and dog cases was similar regardless of season or time period. Overall geographic distribution of human cases by season in Vilas County regarding proximity to waterways did not differ (P = 0.338): winter (N = 40, median = 172 m), spring (N = 39, 247 m), summer (N = 41, 138 m) and fall (N = 38, 184 m), however summer cases were closer to water than spring cases (P = 0.04). Two time periods exceeded control chart upper process/control limits over 23 years for humans, no time periods did for dogs over the past 18 years; both without change in average moving range, using seasonal data.

Conclusion:

The geographic distribution of blastomycosis cases has remained consistent over time and season, perhaps representing important relatively fixed environmental factors.

Rieselbach Distinguished Paper – Session I

*The microecology of *Blastomyces dermatitidis*: the ammonia hypothesis*

Baumgardner DJ, M.D., Department of Family Medicine, Aurora UW Medical Group, Center for Urban Population Health

Background/ significance:

Blastomycosis is an environmentally-acquired systemic fungal infection endemic in Wisconsin. The precise microecology of the etiologic fungus, *blastomyces dermatitidis*, is unknown. The fungus has been associated with nitrogenous waste products and rapidly changing environmental conditions of water tension, temperature, pH and potential chemical inhibitors. Ammonia accumulates in certain microenvironments, is toxic to most fungi, but may not be identified in processed soil samples.

Purpose:

To investigate ammonia tolerance of *B. dermatitidis*.

Methods:

Five Wisconsin strains, four clinical and one environmental isolate, were grown on phosphate and HEPES buffered agar media supplemented with mineral salts, low (1 g/l) and high (20 g/l) dextrose and increasing amounts of ammonium sulfate, at pH 7-8.2, in gas-impermeable bags at 20 degrees C. Growth of soil fungi from 206 aqueous slurries of fresh and frozen soil samples from Wisconsin, Illinois and Ontario was tested on similar media.

Results:

Moderate mold growth and sporulation of *B. dermatitidis* was observed at calculated ammonia concentrations of 4.2-6.3 mM when plates were inoculated with either mold or yeast forms, and lighter mold growth was seen at 42-62 mM ammonia and 1 g/l dextrose. Fungal growth was inhibited in virtually all soil samples at ammonia levels of 2.1-4.2 mM at pH 7 when low dextrose concentrations were utilized.

Conclusion:

The ability of *B. dermatitidis* to survive and grow in organic carbon-poor, high ammonia microenvironments may be important to the competitive success of this fungus. Such microenvironments may include animal droppings or guano on sand soils, animal burrow latrine chambers and runoff from ammonia fertilizers with nitrification inhibitors. This may have implications for other dimorphic fungi such as *Histoplasma capsulatum*.

General Poster Session – Case Reports

Cardiac manifestations from non-fip1L1-pdgfra-associated hypereosinophilic syndrome in a 13-year old African American boy

Salm C, M.D., Department of Internal Medicine, Aurora Sinai Medical Center
St. Clair NE, M.D., Department of Pediatrics, Children's Hospital of Wisconsin
Lustig JV, M.D., Department of Pediatrics, Children's Hospital of Wisconsin
Samyn MM, M.D., Department of Pediatrics, Children's Hospital of Wisconsin

Background/significance: Hypereosinophilic syndrome (HES) is a rare disorder typically seen in Caucasian males aged 20 to 50 years.

Purpose: HES is marked by the overproduction of eosinophils ($> 1,500/\mu\text{L}$) and multi-organ system damage.

Methods: A previously healthy 13-year old African American boy developed erythematous pruritic plaques encircling his upper arms. Later, he developed arthralgias, continuous midline chest pains, dyspnea and fevers. On admission, the boy was edematous with bibasilar rales, cardiac rub and hepatomegaly. His white blood cell count was 22.4 K/uL, with 19% eosinophils. Chest X-ray demonstrated a small left-sided pleural effusion; echocardiogram revealed a small pericardial effusion, but was otherwise initially unremarkable; and, chest CT showed enlarged axillary nodes. The FIP1L1-PDGFR α (F/P) mutation was negative. CD3-CD4 + T cells were absent.

Results: When the diagnosis of HES was made, solumedrol was administered and in 48 hours, the eosinophil count dropped from 7,100 cells/L to 100 cells/L. Serial echocardiograms showed enlargement of the pericardial effusion from small to moderate with development of impaired diastolic function. Endomyocardial fibrosis was not present on cardiac MRI.

Conclusion: Myeloproliferative HES can be diagnosed by detecting the F/P mutation. Cardiac manifestations appear to be most common in this type, ranging from acute necrosis to thrombus formation and fibrosis. Patients typically respond to imatinib mesylate.

Restrictive cardiomyopathy is a rare cardiomyopathy with presenting features similar to those demonstrated by this boy. Symptoms are related to poor ventricular filling, which leads to elevated central venous pressures, dilated atria, and pulmonary hypertension. Echocardiography allows initial evaluation of atrial size, right ventricular and pulmonary pressure, impaired diastolic function and possibly impaired ventricular systolic function by M mode and 2D measures. Cardiac MRI defines cardiac fibrosis, intra cardiac thrombi, ventricular systolic function, and pericardial disease.

Patients with lymphoproliferative HES have less risk of cardiac involvement. The cornerstone of treatment is corticosteroids.

In this unique case, a young African American male developed HES with pericardial effusion and restrictive cardiomyopathy. Cardiac MRI showed no evidence of acute myocardial necrosis, yet echocardiograms showed diastolic dysfunction. The patient's cardiac manifestations, age, and race are atypical for the non-F/P variant of HES.

Lyme meningitis

Tura I, M.D., *Department of Internal Medicine, Aurora Sinai Medical Center*

Usatinsky J, M.D., *Department of Internal Medicine, Aurora Sinai Medical Center*

Background/ significance:

SK is a 35-year-old man who presented to the outpatient clinic with right-sided facial weakness of one day duration. He also complained of severe headaches, generalized fatigue, diffuse arthralgias and myalgias for about three weeks prior to the onset of facial weakness. On further questioning, he remembered erythematous rash following an insect bite six weeks prior to this presentation. This was treated as cellulitis elsewhere, with resolution of rash. Patient was started on Amoxicillin, and Lyme titer was sent which returned positive. As he had headache, lumbar puncture was done and results were positive for Lyme meningitis. Patient was treated with A 28-day course of ceftriaxone with complete resolution of all symptoms.

Purpose:

To increase awareness of lyme meningitis.

Methods:

Case report

Results:

None

Conclusion:

Discussion. We present this case once again to increase the index of suspicion among clinicians in Wisconsin where incidence of Lyme disease is among the highest in the nation, and illustrate that outcomes of this disease are dependent on early recognition. The most common clinical manifestation of early Lyme disease is erythema migrans, which typically develops within 7 to 14 days after tick detachment and present as rapidly expanding, usually single, erythematous lesion with central clearing. It resolves spontaneously, but if left untreated, patients develop serious clinical sequelae. Appropriately treated patients have cure rates exceeding 90%. Serologic testing is not helpful at this point as seroconversion occurs later. Patient with skin rash suggestive of erythema migrans and suspicious clinical and epidemiological history should be treated without any further testing.

Identity crisis of B cells: lymphoplasmacytic lymphoma in transformation to multiple myeloma?

Beg M, M.D., Department of Internal Medicine, Aurora Sinai Medical Center

Background/ significance:

A 59-year-old female presented to the ER with progressive bilateral lower extremity weakness and numbness for a week. She denied any other neurological deficits. On exam, she had decreased motor strength in both lower extremities proximally with power about 4/5. Babinski was equivocal and DTRs were asymmetric. Cranial nerves 2-12 were intact. Her initial labs were all normal except for mildly elevated calcium at 11.1. CT head showed extensive white matter disease, likely atypical MS or ADEM. Further, MRI brain and cervical spine were done and found to be equivocal for MS with DJD noted. She received IV Solumedrol, improved and was discharged to follow up with neurology with presumed diagnosis of MS. Pending labs reviewed after discharge, showed no oligoclonal bands and a CSF protein of 277 on spinal fluid. LPEP showed monoclonal gammopathy, whereas SPEP showed IgM kappa monoclonal gammopathy. At home, the patient fell in the bathroom sustaining a fracture and was re-hospitalized. X-Ray of right femur showed a pathological fracture, for which she underwent intramedullary rodding. Her muscular weakness progressed as well and she developed a spinal level at T4. The MRI showed a 3.5 cm tumor replacing the T4 vertebral body requiring spinal decompression. Tumor biopsy was obtained during the surgery, and a separate bone marrow biopsy done. Both were consistent with the diagnosis of Lymphoplasmacytic lymphoma in transformation to Plasma cell myeloma, a rare entity. Literature is consistent with one such other case reported.

Purpose:

n/a

Methods:

n/a

Results:

n/a

Conclusion:

Plasma cell neoplasms are defined by the presence of monoclonal Igs in the serum and/or urine. The most common is multiple myeloma; characterized by the neoplastic proliferation of a single clone of plasma cells producing a monoclonal IgG or IgA subtype. When an IgM component is detected in serum, the most commonly diagnosed plasma cell neoplasm is lymphoplasmacytic lymphoma or Waldenstroms macroglobulinemia. Lymphoplasmacytic lymphoma is a low grade lymphoproliferative disorder with monoclonal IgM production, hyperviscosity, organomegaly, pancytopenia and bone marrow infiltration by small lymphocytes showing plasmacytoid/plasma-cell differentiation. It rarely evolves into an aggressive malignancy and grows slowly. In our case, morphological and immunotypic findings support a diagnosis of WM with an unusual immunophenotype with diagnosis of transforming into malignant MM cells.

Brevibacterium empyema in an elderly patient

Curtis SJ, P.A.-C., *Aurora West Allis Medical Center*

Taft TA, M.D., *Aurora West Allis Medical Center*

Background/ significance:

A 79-year-old man with multiple comorbidities presented to Aurora West Allis Medical Center in West Allis, Wisconsin with a severe respiratory illness. This elderly man was ultimately diagnosed with a *Brevibacterium empyema* requiring surgery and intravenous antibiotics. There are only 15 case reports in the medical literature of human infection caused by *Brevibacterium* and this is the first reported case of this microorganism leading to empyema.

Purpose:

Brevibacterium is an uncommon pathogen in the immunocompromised patient, and has been unheard of in the immunocompetent patient. We were very interested to find *Brevibacterium* grown on culture from a pleural fluid sample taken from an elderly patient with an empyema.

Methods:

Presentation of a case report include review of specific laboratory, imaging, and microbiological data relating to the case. This includes a review of the literature and recommended treatment regimens for *Brevibacterium* infection.

Results:

A diagnostic thoracentesis was performed on the patient revealing purulent material and 82cc of fluid were drained. The culture revealed many *Brevibacterium* species. The following day a video-assisted thoracotomy revealed a massive abscess filled with a cottage cheese-like fluid with erosion into the diaphragm. Intraoperative specimens of the empyema showed a gram stain of moderate neutrophils, many gram positive cocci, and moderate gram positive bacilli, the culture revealed few *Brevibacterium* species.

Conclusion:

Brevibacterium species are gram positive coryneform bacilli found in cheese. Intravenous vancomycin is the standard treatment for *Brevibacteria* although they have also been noted to be sensitive to betalactams and fluoroquinolones in some cases. According to the medical literature *Brevibacterium* species have thus far been considered opportunistic pathogens infecting those with compromised immune systems. Catheter-related bacteremias are the most commonly reported type of *Brevibacterium* infection. This patient's disease is unique in that it is the first discovery of *Brevibacterium* causing an empyema. In addition, the patient's clinical picture was not complicated by immunocompromise, although as an elderly man with dementia he was certainly debilitated. This case suggests that *Brevibacterium* should be considered a rare cause of empyema in debilitated elderly patients.

General Poster Session – Work in Progress

Maximizing compensation from pharmaceutical care services in an outpatient pharmacy

Phillips KL, M.D., Department of Pharmacy Services, Aurora St. Luke's Medical Center

Wojtal P, Department of Pharmacy Services, Aurora St. Luke's Medical Center

Background/ significance:

Pharmaceutical care (PC) is the responsible provision of drug therapy for the purpose of achieving positive patient outcomes. One approach to provide pharmaceutical care is through medication therapy management (MTM) services. Medication therapy management programs focus on a patient-centered rather than a product-centered process of care. Pharmacists can use PC and MTM opportunities to improve patient care, establish meaningful patient relationships and reduce costs to both the payor and patient.

Purpose:

To maximize compensation from current PC programs, including MTM services, in the Aurora Pharmacy at Aurora St. Luke's Medical Center and implement new programs as they become available.

Methods:

Education of staff on PC programs and identifying eligible patients will be crucial to the success of the program. Baseline data will be collected regarding how many billable PC opportunities occurred in a week compared to what is actually being submitted for compensation in October. The most common payors will be identified. Information about pharmaceutical care programs for different payors will be researched and organized into a comprehensive binder. The binder will include information about different PC programs including patient eligibility, documentation requirements, compensation rates and submission guidelines. A pharmacist and technician training program will be implemented in December. Ten pharmacists and seven technicians will be trained. After the training, continuing education, feedback and tools will be used to continue to improve the number of PC opportunities billed. In April, data will again be collected regarding how many billable PC opportunities occurred in a week compared to what is actually being submitted for compensation. In May, patient satisfaction with PC programs will be evaluated.

Results:

Preliminary results from October show that the pharmacy is currently identifying and billing only < 10% of eligible PC claims. All pharmacists and technicians have been trained to identify and bill PC claims. Results from the April data collection will provide more detailed information on improvement.

Conclusion:

Results and conclusion is still in progress.

Barriers to the initiation of group prenatal care for adolescents in a school-based setting

Tillett J, R.N., Aurora UW Medical Group Midwifery, Aurora Sinai Medical Center

Nyholt E, R.N., Aurora UW Medical Group Midwifery, Aurora Sinai Medical Center

Background/ significance:

The African American infant mortality rate in Wisconsin was 17.6 per 1,000 in 2006, almost 3.5 times greater than the white infant mortality rate. Milwaukee had the second highest percentage of births to adolescents in 2004. Only 30% of teen mothers finish their high school education.

Purpose:

The purpose of the project was to determine the feasibility of using a modified version of the Centering Pregnancy program, a patient-directed and centered group model of prenatal care, to reach vulnerable teens in a school setting and improve their birth outcomes. Significant barriers to the initiation of this program were encountered.

Methods:

As the program was developed and initiated, significant barriers were encountered. The project team attempted to devise solutions to these barriers as they arose.

Results:

Barriers to the initiation of a Centering Pregnancy group prenatal care model in a school-based setting include privacy issues within the school setting; Milwaukee Public Schools rules and regulations; MPS requirement for consents from all parents and/or guardians from teen participants, even if the teens were adults or emancipated minors; lack of community awareness of midwifery; and use of other primary providers for pregnancy issues, among others.

Conclusion:

This poster will review the barriers encountered initiating a Centering Pregnancy program in a school-based setting, and expand on the solutions to the barriers that the team devised. This work is valuable for others who would like to expand care into school-based programs.

Assessment and implementation of best practices to improve narcotic and sedative safety

Bellone J, Pharm.D., *Department of Pharmacy, Aurora St. Luke's Medical Center*

Puotinen J, Pharm.D., *Department of Pharmacy, Aurora St. Luke's Medical Center*

Background/ significance:

The Institute for Healthcare Improvement's Five Million Lives Campaign identifies the need for a nationwide effort to reduce patient harm associated with the use of narcotics and sedatives.

Purpose:

The objectives of this project are to identify narcotic and sedative best practices, assess use of these agents within Aurora Health Care hospitals, determine how best to align current with established best practice standards, and develop a tool for ongoing monitoring of adverse events with these agents.

Methods:

Best practice statements regarding the use of narcotics and sedatives were compiled from recommendations issued by the Institute for Safe Medication Practices, the Institute for Healthcare Improvement, and the Joint Commission. A survey was developed to compare current practices within all thirteen Aurora inpatient facilities with these recommendations. Based on the survey results, opportunities to align Aurora Health Care's current practice with best practice recommendations were identified and prioritized. A mechanism will also be developed to provide medication safety entities within the organization a tool for performing ongoing monitoring of adverse events requiring pharmacologic reversal associated with these agents.

Results:

Results from the survey revealed disparities in the current mechanisms in place to ensure safe use of narcotics and sedatives. Preliminary results indicate that implementation of policies and procedures to limit the number and variety of narcotic and sedative choices on order sets and patient profiles and standardizing available epidural and PCA concentrations will be priorities based on impact and feasibility. A report was created that includes number of naloxone and flumazenil doses ordered per unit per patient admission to act as a monitoring tool for adverse events.

Conclusion:

Conclusions are pending.

Assessment, development and implementation of strategies to improve pharmacy order entry at Aurora St. Luke's Medical Center (ASLMC)

Vingers M, Pharm.D., *Department of Pharmacy, Aurora St. Luke's Medical Center*

Spexarth F, R.Ph., B.C.P.S., *Department of Pharmacy, Aurora St. Luke's Medical Center*

Iglar A, M.S., R.Ph., *Department of Pharmacy, Aurora St. Luke's Medical Center*

Background/ significance:

There are potentially 108 medication orders per cardiovascular surgery patient at Aurora St. Luke's Medical Center. All but 25 of these orders are "as needed" medication orders. It is estimated that a single cardiovascular surgery admission can take the pharmacist 20 to 30 minutes to process. Pharmacists perform medication order entry, and this duty limits the amount of time spent in clinical activities. In addition, having numerous orders per patient adds workload to the pharmacy information system, resulting in slower response time during profile review and order entry. Multiple contingency orders can lead to polypharmacy and potential medication errors.

Purpose:

The purpose of this project is to assess our current practices, evaluate potential interventions and develop and implement strategies to streamline the order entry process.

Methods:

The initial steps of this project involved baseline data collection, including order entry trends at other institutions, order entry volume of all intensive care units, evaluation of existing order sets for CV surgery, and time for pharmacist completion of CV surgery admissions. An intervention list with potential strategies to improve the order entry was created, prioritized and evaluated. Since this project will impact all disciplines, the evaluation process incorporates a Quality Improvement Committee utilizing a multidisciplinary approach.

Results:

A Standing Medication Order Set is being pursued. Data collection will continue.

Conclusion:

Results and conclusions are pending.

Quantify percentage of order entry that triggers alerts and implement reduction strategies

Weitendorf AM, Pharm.D., *Department of Pharmacy, Aurora St. Luke's Medical Center*

Schuenke C, Pharm.D., *Department of Pharmacy, Aurora St. Luke's Medical Center*

Background/ significance:

Medication safety alerts within the computerized hospital order entry system are a useful tool for pharmacists that assist in reducing medication errors and ensuring patient safety. Overriding medication safety alerts may be clinically appropriate, but a high volume of alerts with little credibility can cause alert fatigue. As a result, pharmacists may override important alerts due to this fatigue. Alert fatigue is an issue with increasing importance in the hospital setting and within the Aurora Health Care System.

Purpose:

The purpose of this project is to review the appropriateness of medication safety alerts and decrease the number of order entry alerts that trigger within the Aurora Health Care system, reducing pharmacist alert fatigue.

Methods:

Prior to the initiation of this project, it was submitted to the Institutional Review Board for approval and the current literature regarding alert fatigue in the hospital setting was reviewed. Data was collected via Cerner generated reports and downloaded in Microsoft Excel for further analysis. This data was reviewed for the number of medication orders entered and the number of significant medication safety alerts that were generated. The significance of the alerts was predetermined by eight clinical coordinators within Aurora Health Care. After reviewing the data, removal of insignificant alerts that were generated during medication order entry will be implemented. After implementation of alert removal, the number of alerts of high significance that were triggered during order entry will be reevaluated.

Results:

Currently, data is being reviewed for the potential to reduce the number of alerts that fire during the medication order entry process. Data collection and implementation of reduction strategies will continue.

Conclusion:

Conclusions will be presented at Aurora Scientific Day.

Development of an order capacity control system

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Background/ significance:

The impact of pharmacist order entry on patient care and satisfaction in a hospital setting is not widely addressed in the literature. It is suggested that timely review and entering of orders will assist hospitals in achieving best practices for patient care developed by the Centers for Medicare & Medicaid Service (CMS) and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). In addition, studies in outpatient pharmacies conclude that timely review of orders and shorter wait times increase patient satisfaction.

Purpose:

Nearly 15,000 medication orders are reviewed and entered each day by pharmacists within Aurora Health Care Hospitals. After the implementation of Pyxis Connect in 2007, the Milwaukee Metro Region developed guidelines for order entry assistance among four hospitals. However, a standard time frame for 'timely' order review, entry, or a process for order entry assistance within the system does not currently exist among the 13 hospitals in the Aurora Health Care System. This leads to differences in the volume of orders reviewed and processed by pharmacists at each site, resulting in variable order entry turnaround times. Potential variation in patient care as well as patient/caregiver satisfaction throughout the hospitals also exists. In addition, as unit-based pharmacists are expected to prioritize order entry along with their other clinical responsibilities, maintaining an appropriate volume of order entry is critical to balancing their patient care accountabilities and overall pharmacy services provided. Therefore, the primary objective of this project is to develop an order capacity control system to ensure consistent order review and entry turnaround times within hospital pharmacies in the Aurora Health Care System.

Methods:

To establish a baseline for average time for order review and order entry turnaround, data will be collected from the 13 hospitals in Aurora Health Care. Average time for order review and order entry turnaround will be obtained via reports from our order scanning technology. After baseline data is assessed, areas for improvement will be identified, and interventions will be implemented. Data will be collected after the interventions and compared to the baseline data in order to evaluate whether the interventions improved consistency in order review and order entry turnaround times within the Aurora Health Care Hospitals.

Results:

Data is being reviewed.

Conclusion:

Conclusions will be available after data analysis.

Implementation of a peer evaluation system in a decentralized pharmacy department

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Background/ significance:

Currently the pharmacy department at Aurora St. Luke's Medical Center utilizes a general Aurora Health Care evaluation form, which is filled out by the individual and his or her supervisor. Peer review can provide additional input to the current evaluation process.

Purpose:

The primary goal of this project is to implement a peer evaluation system in the pharmacy department at Aurora St. Luke's Medical Center. A secondary goal is to make the evaluation process more useful to both management and their employees.

Methods:

The current literature was reviewed for current peer evaluation practices in the health care setting. Goals of the evaluation process were established, as well as the utilization of the data collected. The evaluation tool was then decided upon and plans were made for distribution. A large portion of time will be spent on staff education and the completion of the forms. The evaluations will then be collected and reviewed by management and his or her employees. A final data review will be done to assess the ease of tool use, the helpfulness of the information collected and plans for future peer evaluations.

Results:

Results pending.

Conclusion:

Conclusion pending.

Evaluation and assessment of insulin pen devices for inpatient hospital use

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Background/ significance:

Insulin is often used in the inpatient setting to control blood glucose levels. Traditionally, insulin has been delivered after drawing up doses from an insulin vial into a syringe. Recently, insulin pen devices were introduced as a new drug delivery system and they have gained popularity in the outpatient setting. Many hospitals have also begun to use the insulin pen devices for insulin delivery to inpatients in the hospital setting. Since insulin is a high alert medication, the prevention of errors related to this medication is a top priority for many health care providers. It has been proposed that the use of insulin pen devices may improve patient safety over the standard vial/syringe method of insulin administration.

Purpose:

The objective of this project is to evaluate and assess patient outcomes, safety and economic impact of using insulin pen devices within the inpatient setting.

Methods:

The evaluation of feasibility of insulin pen devices for insulin delivery within the inpatient setting will be based on the hospital model of Aurora Memorial Hospital of Burlington. Current insulin preparation, delivery processes, use and waste were evaluated. Insulin pen device literature was evaluated and current insulin pen device use within the inpatient setting was assessed at other health care institutions. Feasibility of the conversion was evaluated on the basis of safety, cost and nursing satisfaction.

Results:

The Institute for Safe Medication Practices (ISMP) has published multiple safety alerts regarding insulin pen devices. Some of these alerts include improper administration techniques, which can lead to needlesticks or over-/underdosing the patient. Infection risk is possible if the insulin pen devices are used on multiple patients. Additionally, it had been found that many times, nurses were withdrawing insulin directly from the pen device with a syringe, which can ultimately lead to inaccurate doses thereafter. Many institutions that utilize insulin pen devices were experiencing these issues. However, insulin pen devices have the advantage of barcoding potential, each pen is used for only one patient and insulin doses are prelabeled, all factors which may contribute to patient safety. Upon evaluation of cost and patient safety issues, the most advantageous insulin pen to consider for conversion is the Lantus (insulin glargine) pen. This could potentially save \$47.02 per patient. The final decision regarding the conversion is pending.

Conclusion:

Awaiting conclusions.

Implementation of anticoagulation safety practices: a national patient safety goal

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Background/significance: Implementation of safety practices to improve patient safety for patients receiving anticoagulation medications for therapy.

Purpose: The safety initiatives implemented moved Aurora Health Care into compliance with the National Patient Safety Goal to reduce the likelihood of patient harm associated with anticoagulation therapy.

Methods: A previous resident conducted a gap analysis of anticoagulation best practices for all 13 Aurora Health Care hospitals. The gap analysis identified areas in which Aurora Health Care could improve consistency of best practices throughout the health care system. Identified areas were incorporated into a plan to meet the Joint Commission timetable for implementation of National Patient Safety Goal 03.05.01 (formerly known as 3E). Working with clinical leaders in the Aurora Health Care Metro Region, an anticoagulation medication monitoring process was developed and documented as a policy. The pharmacist role in the process includes review of baseline laboratory values for anticoagulation medications, ordering necessary lab monitoring, ongoing monitoring and assessment for bleeding risk and appropriate intervention. The process was communicated with pharmacists, physicians and nurses. Collaborative work with site pharmacists for problem solving and process improvement was conducted. Dietary notification of warfarin therapy was assured. Educational materials provided by nursing to patients and their families were reviewed. Evaluation of the monitoring process' effectiveness will be conducted through medication incident reports as well as trending the number of patients with an INR value greater than 4.0.

Results: Implementation of an anticoagulation medication monitoring process.

Conclusion: Data evaluation and conclusion currently in progress.

Improving medication safety through utilization of smart pump data

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Background/ significance:

Smart pumps help to improve IV medication safety by reducing the incidence of administration errors. These pumps save various data elements that can be studied to further improve patient safety.

Purpose:

The objective of this project is to establish a process to collect, analyze, and exhibit the data obtained from pumps used at one hospital. In turn, this information will be used for continuous review at medication safety meetings.

Methods:

To understand what data elements are preserved and for how long, data will be extracted from a small number of pumps, analyzed and organized in Microsoft Excel. The process will then be replicated to a larger number of pumps. The local site medication safety committees will have the data presented for discussion and action. A schedule will be created for regular collection of the data, analysis and presentation to site and system medication safety committees.

Results:

Data collection is in progress.

Conclusion:

Conclusions will be drawn once data collection is completed.

Conclusion:

Awaiting conclusions.

Judged Posters

Microsatellite instability testing on colonic tumors as a means to screen for lynch syndrome

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Background/ significance:

Lynch syndrome or hereditary nonpolyposis colorectal cancer is a familial cancer syndrome caused by germline mutations in mismatch repair genes and may account for 1-5% of colorectal cancer.

Purpose:

In April 2007, Aurora Health Care, the largest health care provider in Wisconsin, implemented pathologist driven MSI testing on all colon tumors that met any of the first three revised Bethesda guidelines as a means to screen for Lynch syndrome.

Methods:

From April 1, 2007 through March 30, 64 tests were performed to evaluate for MSI. MSI testing done on adenomatous polyps, non-colorectal cancers and tumors initially diagnosed outside of this time range were excluded yielding a total of 50 patients. Of those 50 patients, 37 met one of the first three revised Bethesda guidelines and were included in the analysis.

Results:

Thirty-seven patients with colorectal cancer diagnosed from April 1, 2007 through March 30, 2008 met one of the first three revised Bethesda guidelines. Nine of those 37 tumors had microsatellite instability as defined by instability in two or more of the five examined loci. Of those nine patients, four were evaluated by a genetic counselor. Five of the nine patients had genetic testing for germline mutations in mismatch repair genes (four were ordered by genetic counseling and one by the patient's oncologist). Of the five patients who went on to additional genetic testing, three patients were found to have mutations in mismatch repair genes. One patient had a deletion of exon 2 from MSH2, another had a germline MSH2 mutation, and the third had a loss of MLH 1 protein on immunohistochemical staining consistent with a mismatch repair mutation known within that family. All three patients diagnosed with Lynch syndrome by MSI and genetic testing met Amsterdam Criteria II.

Conclusion:

While we were successful in diagnosing three patients with Lynch syndrome by MSI testing, all three of these patients could have been identified earlier based on meeting Amsterdam Criteria II. With thorough family history taking, development of their colon cancer may have been avoided. We must develop an improved plan for ensuring that all patients with abnormal MSI testing receive counseling and appropriate follow-up testing by genomic medicine. Thirteen MSI tests were done inappropriately, largely due to misinterpretation of the revised Bethesda criteria. Further education is critical to ensure that screening is done in the most cost-effective manner possible.

Metabolic syndrome effect on redo atrial fibrillation catheter-based ablation

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Background/ significance:

Framingham data have shown that metabolic syndrome (MS) is highly associated with atrial fibrillation (AF). Radiofrequency catheter ablation is an important tool in AF management. In order to reach high success rate to maintain sinus rhythm, redo ablation might be necessary.

Purpose:

We investigated whether patients with MS require more redo of catheter-based ablation. We referred to the US National Cholesterol Education Program Adult Treatment Panel III, which defines MS as having at least three of the following criteria: Central obesity, triglycerides = 150 mg/dl, HDL < 40 mg/dl (males) or < 50 mg/dl (females), blood pressure = 130/85 mmHg, and fasting plasma glucose = 110 mg/dl.

Methods:

152 consecutive patients (81% men, mean age 58.3 ± 10 years) underwent catheter ablation for AF with mean follow up period of twelve months. They were divided into two groups: Group A with non-MS ($n = 102$; mean age 57 ± 10 years) and group B with MS ($n = 50$; mean age 61 ± 9 years). The Chi-squared test was used to compare the incidence of redo ablation.

Results:

Baseline characteristics were similar in both groups except the following variables (group A vs. group B): systolic blood pressure (120 ± 16 vs. 127 ± 16 , $p = 0.03$), anti-hypertensive meds (1 ± 1 vs. 2.5 ± 1.5 , $p < 0.001$), diabetic meds (0.04 ± 0.2 vs. 0.5 ± 0.8 , $p = 0.002$), lipid-lowering meds (0.5 ± 0.7 vs. 0.9 ± 0.7 , $p < 0.001$), fasting glucose (98.4 ± 16 vs. 113 ± 26 , $p < 0.001$), triglycerides (127 ± 53 vs. 177.9 ± 79 , $p = 0.006$), HDL (48.7 ± 16 vs. 39 ± 13 , $p = 0.01$), body mass index (31.7 ± 7.9 vs. 35.6 ± 5 , $p = 0.0002$), coronary artery disease (14.7% vs. 32%, $p = 0.01$), and persistent AF (34.3% vs. 60%, $p = 0.03$). The redo rate was 34.3% (35/102) in group A and 42% (21/50) in group B, where $p = 0.367$.

Conclusion:

Metabolic syndrome has a trend to increase the chance of redo catheter-based ablation for AF.

Barretts esophagus: biopsy protocols and documentation: room for quality improvement

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Background/ significance:

Current guidelines for endoscopy in Barrett's esophagus recommend documentation of the squamocolumnar junction, the gastro-esophageal junction, and the length of Barrett's esophagus. Additionally, four-quadrant biopsies are recommended every 1-2 cm to effectively screen for dysplasia and carcinoma. European studies have suggested marked non-compliance with current guidelines in Europe.

Purpose:

Our study aims to determine the compliance of US community gastroenterologists in adhering to current guidelines.

Methods:

A retrospective search of the pathology database SNOMED was performed using the Topography Code T-62 for "esophagus," in conjunction with all final diagnoses containing the term "Barrett's." Between January 2006 and February 2008, 155 patients were identified at two community-based teaching hospitals. Of these, 151 were endoscopic biopsies and were surgical specimens. Endoscopy and pathology reports for each of these patients were reviewed to determine if the aforementioned quality indicators are being met during Barrett's esophagus screening.

Results:

The mean age in our study was 64.4 years, 92% of patients were Caucasian, and the male:female ratio was 3:1. Twenty-two endoscopists performed 151 upper endoscopies with the contribution of each ranging from 0.6-13.2%. Thirty percent of the endoscopies were sentinel examinations while 70% were done for repeat screening purposes. The squamocolumnar junction was defined in 100 (66.2%) of these studies at a mean distance of 32.1 cm. The gastroesophageal junction was defined in 94 endoscopies (62.2%) at a mean distance of 36.6 cm. Forty-four endoscopists (29.1%) provided the distance of the diaphragmatic hiatus with a mean distance of 39.5 cm. The mean length of the Barrett's segment was 5.1 cm (Range: 0.0–13.0 cm) as reported by 100 endoscopists (66.2%). The average distance between biopsies was 17.6 mm, and the average number of biopsies taken was 8.3 as documented by 42 (27.8%) and 16 (10.6%) endoscopists, respectively. The average number of specimens collected and verified by the pathologist was 7.7 (Range: 2 – 26). If 4-quadrant biopsies had been performed at 2 cm intervals an average of eight biopsies would be expected at 1 cm intervals 10-20 biopsies would be expected.

Conclusion:

Most community gastroenterologists do not follow the documentation guidelines recommended for Barrett's esophagus. The number of biopsies is at the low end of the recommended range but is consistent with recommendations by national guidelines.

A more rigorous clinical algorithm for the management of suspected pulmonary embolism in emergency room patients to reduce diagnostic imaging without decreasing sensitivity

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Background/ significance:

With the rapid growth of multislice CT (MSCT), radiologic evaluation of the Emergency Department (ED) patients suspected of pulmonary embolism (PE) has substantially increased, carrying with it risks of the exams and added health care costs.

Purpose:

To assess whether more stringent criteria can safely be applied to Emergency Department (ED) patients suspected for pulmonary embolism (PE) to limit need for diagnostic imaging.

Methods:

We prospectively studied 567 consecutive ED patients suspected for PE. Certified ED physicians assessed clinical pretest probability for PE using Wells model. Patients at low and intermediate risk for PE had rapid quantitative latex agglutinin D-Dimer test. Patients with positive D-Dimer test (value $\geq 1.2\mu\text{g/mL}$), meeting Kline Criteria, or at intermediate and high risk for PE, received a CT pulmonary angiogram or SPECT V/Q Scan. All imaging studies were interpreted by board certified radiologists, who were blinded to clinical score and D-Dimer test results. Patients were diagnosed with PE if they had a positive CT pulmonary angiogram, or an intermediate or high probability V/Q scan. Follow up phone calls were made after 30 days to verify no new or missed clinically significant venous thrombo-embolism (VTE).

Results:

One hundred seven patients had Wells score ≤ 6.0 and D-Dimer $< 1.2\mu\text{g/mL}$, of whom none were diagnosed with PE. As such, use of PIOPED II recommended algorithm resulted in exclusion of PE without use of imaging in 18.9% of patients, with sensitivity of 100.0% [95% CI, 90.8 - 100.0] and NPV of 100.0% [95% CI, 96.6 - 100.0]. 308 patients had Wells score < 4.5 and D-Dimer $< 2.0\mu\text{g/mL}$, of whom one were diagnosed with PE. As such, use of more stringent criteria resulted in exclusion of PE without use of imaging in 54.3% of patients, with sensitivity of 97.4% [95% CI, 86.2 - 99.9] and NPV of 99.7% [95% CI, 98.2 - 100.0]. Thus, use of these more stringent criteria would have resulted in utilization of imaging for diagnosis of PE in 201 (35.4%) fewer patients over using PIOPED II recommended algorithm, with statistically equivalent sensitivity and NPV.

Conclusion:

Using a clinical model in conjunction with D-Dimer Assay according to PIOPED II guidelines, a large number of patients without PE are imaged. However, using more stringent criteria with higher modified Wells Score and D-Dimer value led to significant decrease in utilization of diagnostic imaging to exclude PE without compromising patient safety over current recommendations.

Registration accuracy of CT-fluoro fusion is comparable to 3D electroanatomic mapping using CT-merge

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Background/significance: 3D image registration is helpful in guiding left atrial ablation.

Purpose: We tested the accuracy of a CT-fluoroscopy fusion system (CT-FF) in a static model and compared it to the accuracy of electroanatomic mapping (Carto) using merged CT images.

Methods: Eleven glass beads (1 mm diameter) were attached to the left atrial surface of a cardiac phantom. The phantom was then scanned with CT and the left atrium, SVC and CS were segmented. The phantom was positioned on a fluoroscopic table, left atrial geometry was acquired using Carto and merged with the segmented left atrial CT model. A catheter was then visually positioned on the phantom in contact with each glass bead in sequence. The apparent distance between the catheter tip and the bead on the registered model was measured to provide an estimate of registration accuracy. Next, the model was registered using the CT-FF by superimposing a CS catheter, visualized with fluoroscopy, with the segmented SVC and CS from the CT model. A mapping catheter was again brought into contact with the glass beads under direct visualization, and the distance between that catheter, as seen on fluoroscopy, and each bead, as it appeared on the fused image, was measured.

Results: Using Carto, the mean registration error, defined as the distance between the catheter tip and the bead on the surface of the registered left atrial model from the CT scan, was 1.93 ± 1.15 mm, maximum 3.3 mm. Using CT-FF, mean error was 1.75 ± 1.03 mm, maximum 3.2 mm.

Conclusion: Registration accuracy with CT-FF is comparable to that of approved cardiac mapping systems.

Utility of peak cardiac troponin I in risk stratification after primary percutaneous coronary intervention for ST-segment elevation myocardial infarction

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Background/ significance:

Cardiac Troponin-I (cTnI) levels have been shown to be related to infarct size, left ventricular function and prognosis in patients with ST-segment elevation myocardial infarction (STEMI). Data validating this association in contemporary clinical practice, when primary percutaneous coronary intervention (PPCI) is the preferred reperfusion modality for STEMI, is lacking.

Purpose:

We sought to determine the correlation of peak cTnI in STEMI patients undergoing PPCI with the occurrence of major adverse cardiovascular events (MACE).

Methods:

A cohort of 270 consecutive STEMI patients undergoing PPCI [69.6% males (n = 188), mean age 61.2 ± 13 years] within 12 hours of symptom onset, was studied for major adverse cardiovascular events (MACE, i.e., reinfarction, heart failure and cardiogenic shock) as primary end-point. Median door-to-balloon time was 55 minutes. Ultrasensitive cTnI was drawn on all patients at admission (0 hours) and every eight hours subsequently, until peak cTnI level was identified. Predictive ability of peak cTnI for any MACE was analyzed using multiple logistic regression analysis after adjustment for baseline characteristics.

Results:

All patients underwent PPCI, and the right coronary artery was identified as the culprit vessel in half of the cohort. Median peak cTnI level of 97.3 ng/ml was associated with a significantly higher rate of reinfarction, heart failure and cardiogenic shock post PPCI after adjustment for age, location of infarction, Killip class, and door-to-balloon time.

Conclusion:

Assessing peak TnI is a simple and effective method to risk-stratify patients with acute STEMI post primary percutaneous coronary intervention.

Five-year outcomes of diabetics undergoing exercise stress testing compared to non diabetics, stratified according to the duke treadmill score

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Background/ significance:

The Duke Treadmill Score (DTS) has been established as a predictor of cardiovascular outcomes for patients undergoing exercise stress testing (EST). Initial validating studies of the DTS, however, contained low percentages of diabetic patients.

Purpose:

We wished to determine whether the DTS can accurately risk stratify diabetics undergoing EST as it does in non diabetics.

Methods:

A retrospective analysis was performed on 77 diabetic patients and 153 non-diabetic controls who underwent EST. To be included, patients could have no history of coronary artery disease (CAD) or prior cardiac catheterization. Patients were then stratified according to the DTS into low, intermediate or high-risk categories. All patients were followed for five years after the EST. The primary endpoint was a cumulative incidence of death, non-fatal myocardial infarction, or need for cardiac catheterization, and each event, as it appeared on the fused image, was measured.

Results:

Both groups were well matched for baseline demographics, except race. Results for combined low and intermediate DTS risk groups demonstrated a significantly higher number of diabetic patients reaching the primary endpoint (26.3% vs. 12.2%, $p = 0.014$). In the low-risk diabetic group, 66.7% of catheterized patients had significant two-vessel CAD (more than 70% stenosis in one of the major epicardial vessels) ($p = 0.008$), 75% of which included the proximal left anterior descending artery. The control group had a higher incidence of normal coronary angiograms (50% vs. 7.7%, $p = 0.02$).

Conclusion:

The Duke Treadmill Score does not accurately stratify low and intermediate-risk diabetics as it does non diabetics. In diabetics with low or intermediate DTS, a significantly higher number of patients suffer death, myocardial infarction and/or are diagnosed with severe coronary artery disease compared to non diabetics.

Does inferior vena cava filter improve mortality in patients with pulmonary embolism?

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Background/ significance:

Overall 90-day mortality rate is 15 to 18% in acute pulmonary embolism (PE) and even higher in massive PE, in spite of anticoagulation. Thrombolysis has not shown reduction in mortality or recurrent PE at 90 days. We explored how often this adjunctive therapy, inferior vena cava filter (IVC) placement, was performed and how it affected the survival and clinical outcome of patients with PE.

Purpose:

1.) Compare 90-day mortality outcomes in patient treated with or without inferior vena cava filter for pulmonary embolism. 2.) Compare 90-day mortality and recurrent PE in patients treated with tPA with or without inferior vena cava filter.

Methods:

Records of 868 patients who had diagnosis of PE between January 2006 and December 2007 were reviewed. Vital status was verified through hospital electronic medical records.

Results:

IVC filters were placed in 188 (22.0%) patients. Thirty (3.4%) patients received tPA for indications of large clot burden, RV strain and hemodynamic instability. At 90 days, all-cause mortality was 9.3% (81/868 patients). In-hospital mortality 8.0% in IVC filter group as compared to 7.4% in no-IVC filter group. ($p = 0.84$) 90-day mortality 10.6% in IVC filter group and 9.0% in no-IVC filter group. ($p=0.86$) Recurrent pulmonary embolism at 90-day was 6.9% in IVC filter group as compared to 9.1% in no-IVC filter group. ($p = 0.21$) Fourteen (47%) of the 30 high-risk patients treated with thrombolytics did not receive IVC filter. At 90 days, PE-related events (PE death and recurrent PE) occurred in 14.2% of patients without IVC filter compared to no events in patients who received inferior vena cava filter.

Conclusion:

Routine placement of IVC filters in patients with PE does not offer significant survival benefit. However, in selected high-risk patients, IVC filter placement may reduce PE-related mortality and further studies are needed to ascertain whether IVC filter placement reduces PE-related mortality.

Outcomes of renal artery stenting in patients with severely impaired renal function

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Background/significance: Optimal management of renal artery stenosis (RAS) in patients with advanced renal failure is controversial.

Purpose: Our aim was to assess the effect of renal artery stenting in slowing progression to renal failure and in improving blood pressure (BP) control.

Methods: 309 patients with $\geq 70\%$ single or dual RAS were stented between January 2002 and June 2007. Patients were grouped into those with creatinine $< 2\text{mg/dl}$ (mild renal failure) ($N = 233$) and those with creatinine $> 2.0\text{ mg/dl}$ (advanced renal failure) ($N = 76$). Pre- and post-intervention CR, BP and number of antihypertensive medications were analyzed using T-test.

Results: Mean age was 73 ± 9 years. There were more females in the group with mild renal failure (65% vs. 45%, respectively). There were no significant differences between the groups for history of diabetes, hyperlipidemia, smoking. During mean follow-up of 16 months post renal stenting, there was no significant change in renal function overall. Blood pressure control improved in both groups, but significantly more in the advanced renal failure group. Mean systolic blood pressure improvement (20 vs. 15 mmHg) and diastolic blood pressure improvement (11 vs. 6 mmHg) was seen in both groups post stenting.

Conclusion: Renal artery stenting for stenosis results in lower blood pressure in patients with mild renal failure, and even better blood pressure control in patients with advanced renal failure, regardless of any adjunct antihypertensive regimen.

Effect of visual contrast and complexity of food tray in Parkinson Disease

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Background/ significance:

Persons with Parkinson disease are at high risk of developing malnutrition due to various reasons, including visual dysfunction and memory loss. In the health care setting the food tray may not be set up to maximize food intake. Two issues with the food tray include low contrast making it difficult to visualize food and increased number of items on the tray making it difficult to navigate especially for people with memory loss.

Purpose:

The goal of this study is to investigate if patients' perception of contrast and complexity on their food trays affect their ability to locate the food and their food presentation satisfaction.

Methods:

Participants were recruited from a Parkinson clinic. Two "contrast" states (white for low contrast and red and teal for high contrast) and two "clutter" states of food trays were set up. Tests performed included memory and vision assessment. Outcomes were patients' ability to locate food on the tray (performance time/seconds) and patients' food presentation satisfaction (preference, 0-10) Statistical Analysis: Two-way ANOVA was performed using Proc Mixed to assess the association between outcomes and factors. The t-test and ANOVA were performed to examine whether group means of time and preference differ from one another. All statistical analyses were performed using SAS 9.1.

Results:

There were 38 participants with mean age of 73 years. Of all, 50% were male, 50% had memory loss and 45% had executive dysfunction. 47% had poor vision and 66% had impaired color vision. There were no significant differences on performance time for complexity (11.8 vs. 12.8; $p = 0.07$) or color (white: 11.7 vs. teal: 12.6 vs. red: 12.6, $p = 0.8$). There were no significant effects on preference for complexity (6.9 vs. 7.0; $p = 0.9$) or color (white: 6.7 vs. teal: 7.1 vs. red: 7.2, $p = 0.7$). After adjusting for age, memory, vision, complexity ($p = 0.03$) had a significant effect on performance time, while color ($p = 0.8$) had no significant effect on time. For the preference, complexity ($p = 0.9$) and color ($p = 0.9$) had no significant effect. There were no significant interaction between trial vs. complexity and trial vs. color regarding performance time and preference.

Conclusion:

There was a trend showing that only the simple food tray but not color improved the performance time. Participants did not have any preference for clutter or color. After adjustment, complexity significantly decreased performance time. Further analysis will be performed to investigate other potential factors.

Blastomycosis in urban southeastern Wisconsin

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Background/ significance:

Blastomycosis is a potentially fatal systemic and cutaneous disease, endemic in Wisconsin, caused by the environmentally acquired dimorphic fungus, *Blastomyces dermatitidis*. The precise environmental niche of this fungus is unknown. A previous study revealed a non-random distribution of blastomycosis cases by home site in urban Milwaukee County.

Purpose:

This study was conducted to determine the proportion of blastomycosis cases with likely exposures solely in urban areas.

Methods:

Records of 68 urban Southeastern Wisconsin residents with laboratory confirmed blastomycosis diagnosed between January 2002 and July 2007 were examined using medical record review; case interviews; and geographic and statistical analysis. Categorical data was analyzed using chi-squared test with Yates' correction for 2 x 2 tables or Fisher's exact test. For City of Milwaukee cases, a database of all residential home site addresses (N = 139,216) was available. A control group was selected by randomly choosing 6,528 of these home sites and geocoding them for comparison to the 45 city cases that had geocoded addresses. The Mann-Whitney test was used to compare the non-normally distributed distances between case and control home sites in relationship to waterways and parks.

Results:

Of patients reporting their specific exposure history, 40/49 (82%) recalled participating in an outdoor work or leisure activity; and 12/47 (26%) engaged in fishing, hunting, camping or hiking. Of the 68 urban SE WI cases, 64 occurred among residents of Milwaukee County; of those 25/44 (57%) denied travel outside their area of residence, however; 8/11 (73%) who responded definitively recalled urban waterway exposure prior to diagnosis. Of the Milwaukee County cases, 45 occurred in the City of Milwaukee; of those, case residences were concentrated in the near north side and were closer to inland waterways than a random sample of 6,528 control home sites (median distance 0.43 vs. 0.73 miles; $p = 0.003$), but not closer to parks.

Conclusion:

Southeastern Wisconsin residents may acquire blastomycosis in their urban area, sometimes without specific outdoor exposures. Close proximity to inland waterways is associated with blastomycosis cases in urban areas, similar to rural Wisconsin areas. Clinicians should include blastomycosis in appropriate differential diagnoses even in urban residents without travel history or significant outdoor exposures.

Heparin bonded VIABAHN stent graft: incidence of stent thrombosis and HIT

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Background/ significance:

The long term patency rate for endovascular intervention of femoropopliteal occlusive disease has improved significantly with use of the VIABAHN stent graft. Stent graft thrombosis (ST) has been reported with the VIABAHN stent graft. Heparin induced thrombocytopenia (HIT) had previously been reported with the Gore Propaten graft.

Purpose:

A new heparin-bonded VIABAHN (HBV) stent graft was recently approved. The incidence of ST and HBV with the HBV has not been extensively studied. We report our initial experience with the HBV in femoropopliteal disease.

Methods:

From August 2007 to May 2008, 45 patients (50 vessels) underwent endovascular repair of de novo superficial femoral and popliteal artery lesions using HBV stent graft. All patients were prospectively studied both clinically and by venous duplex at one and six month intervals.

Results:

Initial procedural success was 100%. No in hospital mortality. No stent thrombosis during the six month follow up period. Mean platelet count fell by $2.3\% \pm 14$ at follow up.

Conclusion:

Heparin bonded VIABAHN stent graft does not seem to increase the risk of HIT. There is no increased risk of stent graft thrombosis. Larger studies with longer follow up are needed to confirm our findings.

Comparing long-term outcomes between drug-eluting and bare-metal stents in the treatment of cardiac allograft vasculopathy

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Background/ significance:

Cardiac allograft vasculopathy (CAV) is an aggressive pathology of coronary arteries after heart transplantation. It is the leading cause of death after the first year following heart transplantation. With the high mortality and morbidity associated with repeat transplantation, as well as the scarcity of donor hearts it is imperative to find effective alternative treatments.

Purpose:

We compared restenosis rates, mortality and other major adverse cardiac events (MACE) between drug-eluting stents (DES) and bare-metal stents (BMS) used during percutaneous coronary interventions (PCI) for the treatment of CAV.

Methods:

All patients from our heart transplant registry undergoing PCI with stenting indicated for CAV were identified. Procedural data, baseline clinical characteristics, yearly coronary angiography, cardiac events and death were prospectively collected. Primary outcome was in-stent restenosis (ISR). Secondary outcomes were in-segment restenosis, target vessel revascularization (TVR), all-cause mortality and combined MACE.

Results:

36 lesions in 25 patients treated with DES were compared with 31 BMS-treated lesions in 19 patients. There were no significant differences in baseline characteristics. 12-month incidence of ISR was 0% with DES vs. 12.9% with BMS, $p = 0.03$. Over mean (\pm standard error) follow-up of 51.1 ± 7.5 months this difference was significant for vessels ≤ 3 mm in diameter, hazard ratio (HR) DES vs. BMS 0.37 (95% CI 0.11 to 0.95) $p = 0.037$; but ISR was uncommon irrespective of stent type in larger vessels $p = 0.45$. Rates of in-segment restenosis were similar HR 1.13 (95% CI 0.43 to 2.97) $p = 0.81$. Survival free of TVR, death from any cause and MACE were similar; log rank p 0.88, 0.67 and 0.85, respectively.

Conclusion:

This study suggests that in patients with CAV 12-month ISR after PCI is lower with DES than BMS. Beyond 12 months DES maintained lower ISR rate than BMS only in vessels ≤ 3 mm in diameter. Larger multicenter studies are needed to determine the effectiveness different stents in CAV.

Long term patency rate of the VIABAHN stent-graft for lesions TASC class C and D of the superficial femoral artery

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Background/ significance:

Endovascular intervention for femoropopliteal occlusive disease poses a challenge due to a significant restenosis rate.

Purpose:

We evaluated the primary and secondary patency rate of VIABAHN self-expanding stent-graft (W. L. Gore, Flagstaff, AZ) in patients with long, high-grade de novo superficial femoral artery (SFA) lesions.

Methods:

From August 2004 to March 2007, 123 patients underwent a total of 132 endovascular repairs of de novo, TASC grade C or D, SFA lesions, using VIABAHN stent-graft at our institution. All patients were discharged on ASA and clopidogrel. Patients were followed clinically and with duplex scans at one, three, six and 12 months post procedure and if clinically indicated after that. In-stent restenosis was defined as a lumen loss of $\geq 50\%$. Patients with in-stent restenosis on duplex scans underwent an angiogram for confirmation.

Results:

The mean age was 65 ± 13 (59% male). The prevalence of diabetes, hypertension, renal failure and dyslipidemia was 45.5%, 82.1%, 27.6% and 72.3%, respectively. About 36.6% were smokers. The clinical presentation was Fontaine class IIb in 74.8%, class III in 4% and class IV in 21.2%. The lesions were TASC class C in 71% and D in 46.2% with a mean length of 21 ± 10.9 cm. The initial technical success was 100%. All patients had at least two-vessel run-off. There was no in-hospital mortality. There were five (3.8%) cases of total stent-graft occlusions.

Conclusion:

Percutaneous revascularization of de novo, long and high-grade SFA lesions/ occlusions with VIABAHN stent-graft is safe, feasible with excellent long-term patency.

Treatment of vertebral artery and restenosis: efficacy of drug eluting stents

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Background/ significance:

Vertebral artery stenosis (VAS) can lead to incapacitating symptoms and potentially debilitating strokes. Previous studies have demonstrated that the rate of restenosis after percutaneous angioplasty and stenting of VAS is less than 5%. It has been demonstrated that drug eluting stents may result in an even lower rate of restenosis.

Purpose:

To determine the restenosis rate in drug eluting stents.

Methods:

All consecutive patients who underwent percutaneous angioplasty and stenting of VAS between June 2002 and March 2008 were included. All procedures were performed at the same center by an experienced interventional cardiologist and neurosurgeon. Clinical and procedural data were collected. Patients were followed for up to an average of 19 months and restenosis was monitored by either ultrasound, angiography or MRA.

Results:

A total of 30 patients were included. Clinical, angiographic, and procedural data are summarized. A total of 34 stents were deployed with a procedural success of 100%. Of these, 26 were bare metal stents (BMS) with a restenosis rate of 7.6%. Eight stents were drug eluting stents with a restenosis rate of 37.5%, all of the restenosis occurring within five months.

Conclusion:

Previous studies have demonstrated that a lower rate for restenosis (VAS) is associated with drug eluting stents. Our study shows a much higher rate of restenosis in drug eluting stents. Larger studies with longer follow up are required.

Prone whole breast irradiation using 3D conformal radiotherapy in women undergoing breast conservation for early disease yields high rates of excellent-good cosmetic outcomes

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Background/ significance:

Several studies have shown increased radiation-related toxicities and worse cosmetic outcomes for patients with large, pendulous breasts undergoing breast conserving therapy. Our institution has used three-dimensional conformal radiation therapy (3DCRT) methods to deliver whole breast irradiation (WBI) in the prone position in order to address technical difficulties associated with treating large, pendulous breasts and/or large body habitus.

Purpose:

The goal of this study was to review our updated experience using prone breast WBI to determine whether the acute and late toxicities, cosmetic outcomes and recurrence rates are acceptable in this set of patients.

Methods:

Between 1998 and 2006, 111 women underwent WBI in the prone position using 3DCRT. The mean breast dose was 49 Gy to isocenter. 71% of patients received a boost (mean 10 Gy/5 fractions). Acute and late toxicities were scored using the Common Toxicity Criteria Version 3.0. Cosmetic outcome was assessed via the Harvard Scale.

Results:

The median age at diagnosis was 61 (27-91); 75% were post-menopausal. Median BMI was 34 (19-51), and median breast volume was 1401 cc (322 - 4800). Tumors were Tis-20%, T1-61%, T2-17%, T3-2%, and 14% had positive axillary nodes. Median follow-up was 40 months. Acute toxicity analyses demonstrated Grade 3 (G3) dermatitis occurred in 5% of patients, the most severe pain experienced was G2 (21%), and no patients experienced G3 or higher edema. Scored separately, 16% of patients had moist desquamation: 14% confined to the inframammary/axillary fold areas. Late toxicity was assessed in patients followed >one year (n=106). G2 induration/fibrosis was experienced in 38% of patients and G3 in 3%. Breast asymmetry was found in 26% of patients. Good to excellent cosmesis was achieved in 89% of patients. A higher BMI was associated with more moist desquamation and breast pain ($p < 0.03$) during treatment but did not impact the rate of fibrosis or good-excellent cosmetic outcomes. Four patients were diagnosed with an ipsilateral breast tumor (3.8%), with a mean time to recurrence of 62 months (33-25 months).

Conclusion:

In patients with large pendulous breasts or increased BMI, delivering WBI in the prone position using 3DCRT results in favorable toxicity profiles and a high rate of excellent and good cosmetic outcomes. Recurrence rates were similar to those anticipated using supine breast irradiation. This series adds to the growing literature demonstrating prone breast irradiation may be advantageous in select patients.

ACOG practice bulletins: original vs. replaced guidelines

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Background/ significance:

To better understand how the obstetric-gynecologic knowledge has evolved, a comparison of old and new national guidelines is helpful.

Purpose:

Quantify the changes in recommendations and references in the original vs. replaced practice bulletins(PB) published by ACOG.

Methods:

From ACOG Web site, the obstetrics and gynecology PB from December 1998 to 2008, were reviewed. The Guidelines replaced were compared to the original PB. The information extracted from PB was: time of publication, grade of recommendations (A, B or C), level of references (I, II, III, others) and the journal published in. We categorized the journal into weekly (NEJM, JAMA or Lancet), the two important obstetric journals (AJOG or OG), and others. We analyzed recommendations for: the percent changed, and quantify the grade. Regarding the references cited, we analyzed: the percent change, level of references, and type of journal published. Paired t-test, Wilcoxon paired matched test, and Chi square test for trend were used.

Results:

ACOG published 78 PB, and among them 24%(19) were replaced. Of the 44 obstetric PB, 20% have been replaced and of 34 gynecologic PB, 29%. The median time interval between the revised and original PB was 1,827 days, and it was not significantly different for the obstetric vs. gynecologic topics ($p = 0.166$). Overall the median numbers of recommendations per PB increased significantly from eight to 10 ($p = 0.001$). For the 9 obstetric PB, the median recommendations per guidelines were not significantly different ($p = 0.155$), and for the 10 PB in gynecology increased significantly (from 10 to 12; $p = 0.002$). Among the 19 topics, the grade of recommendations did not change significantly between the old and replaced PB ($p = 0.250$). Among the 9 obstetric and 10 gynecologic topics the type of recommendations did not change either ($p = 0.0657$ and 0.318). For the 19 topics, the number of references increased 18% but median citations per PB did not change significantly ($p = 0.067$) overall, for obstetric ($p = 0.321$) and gynecologic topics ($p = 0.164$). Compared to the original PB, among the 19 replacements, the level of citations changed did not change significantly ($p = 0.130$), as it did not for obstetric ($p = 0.163$), and gynecologic topic ($p = 0.287$). The journals the references were published in did not change significantly overall ($p = 0.554$), as well as obstetric ($p = 0.723$) and gynecologic topics ($p = 0.291$).

Conclusion:

Though ACOG has replaced about 25% of guidelines, there is no apparent quantifiable difference in the grade of suggestions or the level of references cited.

Recurrent shoulder dystocia: a review

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Background/ significance:

Uncommon and unpredictable, shoulder dystocia is a cause of constant consternation to clinicians. Infrequently shoulder dystocia is associated with orthopedic and neurologic injury, with alleged malpractice and payment. According to ACOG, brachial plexus injury (BPI) is noted with 4-40% of shoulder dystocia and according to Royal College of Obstetricians and gynaecologists, in 4-16%.

Purpose:

The purposes of the review were to determine the recurrence of shoulder dystocia, and ascertain the likelihood of brachial plexus injury (BPI).

Methods:

A PubMed search was done using a combination of terms "shoulder dystocia," "reoccurrence," "repeat" and "subsequent pregnancy." The search was confined to English language and to publication from 1980 to 2008. Articles were excluded from the review if they were case reports, foreign language studies, animal studies, recurrence not mentioned, review articles, and simulations. We did not include abstracts presented at meeting and subsequently not published in a peer-review journal. We also examined the references cited to ensure completeness. The data was entered into an Excel sheet (Microsoft, Washington) for tabulation. Odds ratio (OR) and 95% confidence intervals (CI) were calculated and CI not crossing integer 1 was considered significant. If the 95% CI of two proportions overlapped it was regarded as a non-significant difference.

Results:

The search yielded 178 abstracts but 170 were excluded because 11 focused on simulation, 13 were in foreign language, 21 were case reports, 25 were review articles, and 99 did not mention the likelihood of recurrent shoulder dystocia. Only 8 articles provided the reoccurrence rate. Five reports provided the rate of BPI with subsequent pregnancy and it was 19/1,000 vaginal births (107/5, 596; 95% CI 16-23/1,000 births). The BPI rate increased to 45/1,000 newborns (49/1,093; 95% CI 34 to 58/1,000) if shoulder dystocia reoccurred. BPI injury occurred significantly more commonly if there was reoccurrence of dystocia (4%, 49/1,093) than not (1%, 58/4,503; OR 3.59, 95% CI 2.44, 5.29).

Conclusion:

For parturients with history of shoulder dystocia, the risk of recurrence is about one in 10, the likelihood of BPI, 19/1,000 vaginal births and with recurrent dystocia, 45/1,000 births. From the review it is not feasible to discern which delivery will be complicated by reoccurrence dystocia but there is no reason to believe that either the first or the repeat dystocia are predictable or preventable.

Maintenance tocolytics for preterm symptomatic placenta previa: a review

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Background/ significance:

Besinger et al showed that maintenance tocolytics for preterm symptomatic placenta previa are used by some clinicians in the country. However, the ACOG practice bulletin on preterm labor recommends “neither maintenance treatment with tocolytics drugs nor repeated acute tocolytics.”

Purpose:

To determine if prolonged tocolytics with preterm symptomatic previa improves perinatal outcome.

Methods:

An OVID Medline and Cochrane Database were searched from Jan 1950 to Jan 2009. We included publications in English language, retrospective and randomized studies that provided information on: delivery within < 48 hrs or > 7 days of admission, delivery < vs. > 34 weeks, maternal and neonatal morbidity or perinatal mortality. Data is presented as % (n). We calculated the odds ratio (OR) and 5% confidence intervals (CI).

Results:

The search indicated that there were 2700 publication with the term “placenta previa” Only 21 articles were found using keywords Placenta previa and Tocolysis. Of these 21 publications, only three publications (one randomized control trial, RCT and two retrospective studies) met the inclusion criteria. The combined retrospective studies (148 in tocolytic group and 69 in no tocolytics) showed that the likelihood of delivery < vs. > 48 hours of admission (OR 1.26, 95% CI 0.52, 3.00) or < vs. > 7 days (OR 1.19, 95% CI 0.63, 2.28) was not significantly different. The RCT (30 in each group) showed that patients who received tocolytic were significantly less likely to deliver within 48 hours (7% vs. 50%; RR 0.18, 95% CI 0.04, 0.67). Pregnancy was prolonged for at least one week (83% vs. 40%; RR 3.10, 95% CI 1.38-6.96). The gestational age at delivery (34.9 + 2.4 vs. 33.6 + 2.4 weeks; $p < 0.05$), prolongation of pregnancy (25.3 + 17.2 vs. 14.4 + 20.3 days; $p < 0.05$), and the mean birth weight (2.27 + 0.59 vs. 1.95 + 0.55 kg; $p < 0.05$) was significantly higher in the treatment group. None of the studies provided data on maternal or neonatal morbidity or any improvement in neonatal outcomes. It is noteworthy that the only RCT on the topic is not compliant with CONSORT statement without mention of sample size calculation, intent-to-treat analysis, allocation sequent and concealment.

Conclusion:

There is a paucity of data on maintenance tocolytics for preterm symptomatic placenta previa. This review shows some benefit of using tocolytic for seven days. With increasing incidence of placenta previa, CONSORT compliant RCTs are needed to demonstrate the clinical benefits of using prolonged tocolytics.

Osteoporosis screening improvement project

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Background/ significance:

Osteoporosis is a common disease that is characterized by low bone mass with microarchitectural disruption and skeletal fragility, resulting in an increased risk of fracture. Osteoporosis or low bone mass (osteopenia) occurs in about 44 million American men and women, accounting for 55% of the population age 50 and over. The goal of screening is to identify high-risk individuals for lifestyle modification and pharmacologic intervention prior to the first fracture. In the United States, the majority of groups recommend BMD assessment in postmenopausal women 65 years and older regardless of risk factors.

Purpose:

To increase number of female patients, 65 and older, screened for osteoporosis, and to improve osteoporosis awareness at our clinic and stimulate providers to think about this common condition.

Methods:

The project was launched at the ASMC Internal Medicine Clinic for 14 weeks starting in February 2008. As a first step, each week providers' schedules for the following week were reviewed, and female patients ages 65 and older were identified. Those who did not have records of DEXA scan in the past three years were highlighted. Cards notifying respective providers were created for these patients and distributed in their mail boxes, as a reminder to discuss osteoporosis screening with the patient during her appointment, and order DEXA scan if appropriate. 30 minute clinical conferences each day of the week preceding initiation of the project were conducted, to familiarize faculty and residents and discuss osteoporosis overall, its definition, diagnosis, and indications for screening. The second phase will include discussion of results with providers, including update about current recommendations regarding osteoporosis and osteopenia treatment, and is currently under way.

Results:

A total of 342 women eligible for screening were identified. Of those, 172 (51.2%) were already screened. Application of screening reminder resulted in additional 55 women, who underwent osteoporosis screening. Thus, the total number of patients screened after the study completion was 227 (67.4%), an improvement of 16.3%.

Conclusion:

The implication of the screening reminder cards resulted in 16.3% increase in osteoporosis screening rates in our clinic, however, we believe that improvement might actually be more significant, as many of our providers admitted that they paid more attention to this matter since the project started. This was a very simple intervention which required minimal time and resources.

Dual-operator angiography followed by percutaneous coronary intervention is associated with higher procedural complications compared to single-operator procedures: a quality-of-care study

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Background/ significance:

Two approaches are used during single-session diagnostic angiography with percutaneous coronary intervention (PCI): single-operator (diagnostic and intervention done by single-operator - single-operator PCI) and dual-operator (a non-interventionalist performing the diagnostic part and interventionalist to follow for intervention, dual-operator PCI). We compared short-term outcomes of PCIs done by single- vs. dual-operators.

Purpose:

To study and compare the outcomes in dual versus single-operator PCI.

Methods:

A total of 9,818 PCI (dual-operator PCI = 723; single-operator PCI = 9,095) were performed in 8,028 consecutive patients between January 2005 and December 2007. The data were extracted from the ACC NCDR Cath PCI Dataset; standard NCDR definitions apply for all variables, including renal failure, defined as 1). Increase of serum creatinine to > 2.0 mg/dl or two times the baseline creatinine level. 2). New requirement for dialysis.

Results:

A total of 9,818 PCI (dual-operator PCI = 723; single-operator PCI = 9,095) were performed in 8,028 consecutive patients between January 2005 and December 2007. There were no significant differences between the two groups in term of age, gender, race, comorbidities, vascular complications, bleeding and in-hospital mortality. Single-operator PCI was more frequently performed in patients presenting through the emergency department, with UA/NSTEMI, emergent cases, on lesions of severity level C ($p < 0.001$ for all). Dual-operator PCI was associated with more total case time, fluoro time, contrast volume, post PCI renal failure and increased length of stay. Adjusted odds of renal failure for dual-operator PCI was 2.35 (CI 1.06 – 5.23, $p = 0.04$). In multivariate analysis, post PCI renal failure was significantly associated with total case and fluoro time and shows a trend towards association with contrast volume.

Conclusion:

Even though single-operator PCI was performed in higher-risk patients, the total case and fluoroscopy time, contrast volume, renal failure and length of stay were significantly higher in the dual-operator PCI.

Change in health-related quality of life following resective epilepsy surgery

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Background/ significance:

Health related quality of life (HRQOL) in patients with epilepsy has been studied extensively within recent years. Due to the significance of undergoing resective surgery, quality of life measures have been studied as a method to gain a better understanding of the impact and outcome of surgery from a patient's perspective. Many studies have shown that HRQOL is significantly related to seizure outcome, with seizure free patients reporting the greatest improvement.

Purpose:

The goal of this study is to examine the impact of seizure status on HRQOL following resective epilepsy surgery.

Methods:

Data was collected from 113 patients who underwent surgery (45 left temporal, 51 right temporal and 17 other) between 1994 and 2007 and who completed pre- and post-surgical evaluations including the Quality of Life in Epilepsy Inventory-31 (QOLIE-31). The QOLIE-31 is a 31 item survey, which is comprised of seven subscales and an overall composite score. The average time between evaluations was 7.4 months. Patients were divided into two groups based on the occurrence of seizures post-operatively: seizure-free and continuing seizures. Pre- and post-surgical QOLIE-31 scores were analyzed using paired-samples t-tests.

Results:

Analysis of the QOLIE-31 data from the 113 patients yielded significant improvements in six of the seven subscales and the composite score of the QOLIE-31: cognitive functioning (CF), energy/fatigue (EF), medication effects (ME), seizure worry (SW), social functioning (SF), overall quality of life (QOL) and the overall (OQL) composite score (all p values < .03). The emotional well-being (EWB) subscale did not significantly increase. Significant improvement was seen in all seven subscales and the overall composite score in patients who remained seizure-free following surgery (n = 63). Of the 50 patients who experienced seizures post-op, a significant increase was seen in the four of the seven subscales; SW, ME, SF and EF and also in the OQL composite score (p < .01). CF, EWB and QOL also showed improvement but failed to reach significance.

Conclusion:

In this study, patients reported an overall improvement in HRQOL following surgery. As expected, the most significant increase in QOLIE-31 scores was seen in the patients who achieved seizure freedom. Unexpectedly, the patients who continued to have seizures also reported significant improvement in the majority of subscales. The SW subscale demonstrated the largest increase postoperatively in both seizure-free patients and in patients with continued seizures.

Clinical and angiographic outcomes in patients with ST-elevation myocardial infarction undergoing single vs. multiple vessel PCI

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Background/ significance:

As per the 2004 ACC/AHA guidelines, simultaneous percutaneous coronary intervention (PCI) of noninfarct artery at time of primary PCI in hemodynamically stable patients with acute myocardial infarction is not advised (class III recommendation).

Purpose:

In severe multi-vessel disease with persistent block of the infarct-related vessel post PCI, same-procedure catheter-based revascularization may reduce the ischemic burden. But the clinical and angiographic impact of multi-vessel vs. single-vessel PCI in STEMI is unknown.

Methods:

We retrospectively evaluated data from 2,077 consecutive ST segment elevation myocardial infarction (STEMI) patients between 2005 to 2008, who presented within 12 hours of onset of symptoms suggestive of myocardial infarction, to our emergency department at our tertiary care center at Milwaukee, Wisconsin. All patients underwent primary PCI and data was obtained from local ACC-NCDR Cath PCI registry and Social Security Death Master File.

Results:

Single-vessel PCI was done in 1,449 patients, whereas multi-vessel PCI was done in 578 patients. Age, gender, co-morbidities, ejection fraction and peri-procedural medications were similar between the two groups. We were unable to determine if all lesions in patients undergoing multi-vessel PCI were infarct-related. Patients with multi-vessel PCI had higher incidence of lesions in the RCA (77 vs. 71%, $p = 0.005$), proximal (53 vs. 46%, $p = 0.005$) and mid-distal LAD (55 vs. 45%, $p = 0.005$). There were also more grade C lesions (58 vs. 52%, $p = \text{ns}$). In-hospital and one-year mortality (cardiac and overall), vascular and bleeding complication rates were similar. Renal failure was higher in the multi-vessel group (OR = 1.44, CI = 0.71–2.91; $p = 0.31$). Survival analysis revealed no significant differences.

Conclusion:

Mortality rates and cardiac, vascular and bleeding complications for multi-vessel PCI in patients with STEMI are no worse than those for single-vessel PCI.

Clinical outcome of elderly patients with primary percutaneous coronary intervention for acute ST-elevation myocardial infarction

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Background/ significance:

Primary percutaneous coronary intervention (PPCI) with a goal of door-to-balloon time (DBT) < 90 minutes is the choice reperfusion strategy in ST-elevation myocardial infarction (STEMI). Data on PPCI as the optimal reperfusion strategy in elderly patients is sparse.

Purpose:

The study was conducted to determine clinical outcome in terms of in-hospital mortality and major adverse cardiovascular events (MACE) post PPCI in elderly patients with STEMI.

Methods:

A cohort of 790 consecutive STEMI patients was studied for survival and MACE after PPCI. Patients were divided into two groups i.e., ≥ 75 years (elderly) and those < 75 years. Using a precise cardiac catheterization protocol, PPCI was used as the choice reperfusion strategy in both groups.

Results:

Baseline characteristics of the patients are presented. Median DBT time was 82 min. in ≥ 75 age group vs. 66 min in the < 75 age group ($p = 0.0377$). An increase in DBT was associated with an increase in both the in-hospital mortality and MACE. Elderly patients had lower ejection fraction at presentation compared to younger patients ($p = 0.0386$). The in-hospital all cause mortality, including cardiovascular mortality, was higher in the elderly group compared to the younger group (15.5% vs. 2.7%, $p < 0.0001$). In elderly patients, MACE was found to be higher (32.5% vs. 16.1% $p < 0.0001$). Using a multivariate logistic regression analysis, history of heart failure was found to be the single most important independent risk predictor for death in patients over age 75 years compared to the younger group.

Conclusion:

We observed higher mortality and overall MACE in elderly patients with acute STEMI. Although partly due to higher burden of preexisting cardiovascular disease, a higher DBT time, may also be responsible.

Exercise capacity and echocardiographic evaluation of right heart indices in patients on long-term ambrisentan therapy for established pulmonary arterial hypertension

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Background/ significance:

Approval of ambrisentan, a selective endothelin-receptor antagonists, is based largely on trials demonstrating improvement in six minute walk distances (6MWD). Though periodic surveillance right heart echocardiograms are routinely evaluated in patients with pulmonary arterial hypertension on these and other medical therapies, there is a paucity of data on the long-term effects on the right heart.

Purpose:

To evaluate right-sided cardiac variables from surveillance echocardiograms and six-minute walk distance (6MWD) in patients on maximum ambrisentan therapy.

Methods:

Cohort included six medication-naïve females, mean age 48 ± 5 years, with PAH (2 CREST, 2 idiopathic PAH, 2 SLE) and WHO class II symptoms. Study protocol included a 12-week lead-in dose of ambrisentan, thereafter maximized to 10 mg daily. 6MWD was recorded at baseline, 3, 6, 9 months and up to 3.25 years on maximum dose therapy. Echocardiographic variables were recorded at baseline and repeated at intervals between 12 and 24 weeks, and beyond 60 weeks. Paired t test was used for statistical analysis, and values expressed as mean \pm SE.

Results:

Mean 6MWD at baseline was 391 ± 5 m. There was a significant increase in 6MWD from baseline after lead-in dosing ($+37.8 \pm 9.4$ m, $p = 0.01$), 3 months ($+66.0 \pm 16$, $p = 0.009$) and 6 months on optimal dosing ($+57.1 \pm 17$ m, $p = 0.02$). One patient died of a pulmonary embolism 15 months into the study, but the 5 survivors had a mean increase in 6MWD of 57.3 ± 11 m ($p = 0.006$) beyond 36 months of treatment. Mean right ventricular systolic pressure at baseline was 77.7 ± 6 mmHg, size 3.8 ± 0.4 cm, ejection fraction $36.7 \pm 4\%$. No significant changes in these indices were observed during the study period. Two patients improved from WHO class II to class I, two remained in WHO class II and two progressed to WHO class III.

Conclusion:

In this small cohort of females with moderate PAH, right heart indices did not worsen significantly during more than three years of ambrisentan 10 mg daily. Improved and sustained exercise capacity was noted on long-term follow up. Future studies with larger cohorts are needed to assess the impact of ERA on right heart indices.

Oral Presentation – Session II

Impact of micropuncture on vascular access-site-related complication rates in percutaneous coronary interventions

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Background/ significance:

Vascular access site-related complications during percutaneous coronary interventions (PCI) are known to increase morbidity and mortality. In spite of its widespread use, the ability of micropuncture to lower these complication rates has not been validated.

Purpose:

To determine whether arterial access site-related complication rates have changed since implementing micropuncture during percutaneous coronary interventions in our institution.

Methods:

We reviewed our access-site complication rates from 2005 to 2007 in patients undergoing PCI; access via the traditional 18-gauge thin-wall needle (TWN) versus the 21-gauge micropuncture kit (MPK). Data was extracted from the ACC-NCDR CathPCI Registry. Event rates of 1,706 patients who underwent PCI with TWN access from 1/05 to 1/06, and 1,997 patients with MPK from 7/06 to 7/07 were reviewed. Primary endpoints included ACC-defined vascular complications of bleeding and pseudoaneurysm confirmed by ultrasound. Data was extracted from the ACC-NCDR CathPCI Registry. Event rates of 1,706 patients who underwent PCI with TWN access from 1/05 to 1/06, and 1,997 patients with MPK from 7/06 to 7/07 were reviewed. Primary endpoints included ACC-defined vascular complications of bleeding and pseudoaneurysm confirmed by ultrasound.

Results:

Overall bleeding rates using TWN versus MPK were 1.5% (26/1706) and 1.9% (41/1997, $p = 0.5$) and pseudoaneurysm rates were 0.8% (14/1680) and 1.3% (25/1974, $p = 0.25$), respectively. There was a trend towards a higher mean clopidogrel loading dose in the MPK group (360 mg for MPK vs. 297 mg for TWN); the highest loading dose of 600 mg was observed more frequently in the MPK group (39% vs. 8%). Test for linear trend in proportions among the varied loading doses between the two groups was not found to be statistically significant ($p < 0.08$).

Conclusion:

Use of MPK for gaining vascular access in PCI did not contribute to reduced site-related complication rates.

Assessment of anticoagulation strategies in peripheral percutaneous intervention

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Background/ significance:

Anticoagulation strategies used in peripheral percutaneous intervention (PPI) are based primarily on percutaneous coronary intervention studies. In these studies, higher doses of heparin were used usually in combination with a GP IIb/IIIa agent. There are no studies comparing lone bivalirudin versus low-dose heparin in PPI. We compared the efficacy and safety of bivalirudin versus low-dose unfractionated heparin (UFH) in PPI.

Purpose:

Safety comparison between bivalirudin and heparin.

Methods:

From March through July 2008, 236 consecutive patients who underwent PPI at our institution were treated with either bivalirudin or low dose UHF in an alternating manner. These patients were assessed prospectively during their index hospitalization for procedural success and bleeding complications. Out of 236 patients, 111 patients were dosed with UFH at 50 u/kg (goal ACT of 180-240) and 125 patients were dosed with bivalirudin at 0.75 mg/kg bolus followed by 1.75 mg/kg infusion. Procedural success was defined as less than 20% post-procedure residual stenosis. Major bleeding was defined as intracranial or retroperitoneal hemorrhage, or fall in Hgb of 5 g/dl. In addition, an anticoagulation cost analysis was conducted.

Results:

Procedural success and major bleeding rates were similar with bivalirudin and heparin (98% vs. 99% and 3.2% vs. 1.0%, respectively). Furthermore, there were no differences in minor bleeding, time to sheath removal, time-to-ambulation, and length of hospital stay. The average charge to patients for bivalirudin was \$2,824 and \$66 ± 38 for heparin.

Conclusion:

Low-dose UFH is equally as effective and safe as bivalirudin, when used as an anticoagulation strategy in patients undergoing PPI. In addition, use of low dose UFH is less costly than bivalirudin. Larger randomized studies are required to further evaluate these issues.

False positive activation of cardiac catheterization laboratory for ST-segment elevation myocardial infarction

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Background/ significance:

Medical institutions are ranked and compensated based on how they perform in providing primary percutaneous coronary intervention (PCI) within 90 minutes of first medical contact to patients with ST-segment elevation myocardial infarction (STEMI). To meet this standard, institutions all over the country have developed protocols to provide emergency cardiac catheterization usually bypassing other clinical assessments once STEMI is suspected. This may lead to catheterizations in patients who do not need PCI (false positive cases).

Purpose:

Determine the frequency, predictors and prognosis of false positive cardiac catheterization laboratory activation for STEMI.

Methods:

Prospective registry of patients receiving cardiac catheterization with intention of primary PCI indicated for STEMI between January 2005 and December 2008 at SLMC. False positive STEMI was defined as absence of a culprit lesion on coronary angiography in a patient diagnosed with STEMI. Multivariate logistic regression was used to identify predictors of false positive STEMI. Odds ratios (OR) are presented with 95% confidence intervals (CI).

Results:

664 patients received emergency cardiac catheterization indicated for STEMI. 84 (12.7%, 95% CI 10.1 to 15.2%) had no culprit lesions on coronary angiography i.e., false positive STEMI. Independent predictors of false positive STEMI included absence of reciprocal ST-T changes on ECG with OR 12.62 (95% CI 5.74 to 23.58), symptom duration > 12 hours OR 8.92 (95% CI 3.32 to 18.90), non-smoker 3.55 (95% CI 1.65 to 7.65), age < 65 years 2.32 (95% CI 1.01 to 5.62), previous PCI 0.11 (0.02 to 0.60) and previous myocardial infarction 0.08 (0.01 to 0.45). Normal baseline cardiac marker levels were not predictive of false positive STEMI. There were no in-hospital adverse cardiac events or deaths among false positive STEMI patients compared with 6.2% and 5.2%, respectively among STEMI patients with a culprit coronary lesion, $p < 0.05$. Among false positive STEMI patients the final diagnosis was cardiac in 35.7%, non cardiac in 52.4% and unknown in 11.9%.

Conclusion:

False positive STEMI is common among patients referred for emergency cardiac catheterization. Emergency cardiac catheterization for false positive STEMI may be reduced by carefully identifying these patients from their ECG and clinical history, but not by cardiac marker levels. The in-hospital outcome is good but further studies are needed to evaluate long-term prognosis.

Increased fluoroscopy time in percutaneous coronary intervention is associated with more complication and increased one-year mortality

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Background/ significance:

Increasingly, older patients and complex lesions requiring percutaneous coronary intervention (PCI) require more fluoroscopy time (FT). The association of increased FT with patient characteristics, outcomes and one-year mortality is unclear.

Purpose:

To determine the association of increased fluoro time with patient characteristics, outcomes and mortality.

Methods:

It is a single centre, prospectively collected data on 18,279 PCI's done between 2002 and 2008 at our institution. For patients requiring multiple PCI during study period, only first procedure was included. The primary endpoint was one-year all cause mortality. Secondary endpoints include: in-hospital mortality cardiovascular events and other post PCI non-fatal complications.

Results:

There were total of 25,754 vessel segments treated with a mean fluoro time of 13.06 ± 0.07 minutes. By multivariate logistic regression, higher FT was found to be associated with number of segments revascularised, previous CABG, lower TIMI flow, peripheral arterial disease, coronary dissection, highgrade lesion, restonsis, left main and right coronary lesions. After adjusting for above confounders, we found that event rates per 10 minutes increase in fluoroscopy time resulted in higher one-year mortality (OR 1.18; CI 1.09 - 1.26), in-hospital cardiac events (OR 1.32; CI 1.25 - 1.41), vascular complications (OR 1.35; CI 1.18 - 1.53), bleeding (OR 1.27; CI 1.16 -1.40), $p < 0.0001$ for all of the above. We also found an increased trend in renal failure (OR 1.20; CI 1.04 - 1.39, $p < 0.01$), stroke (OR 1.23; CI 0.98 - 1.54, $p0.008$) and in-hospital mortality (OR 1.22; CI 1.07 - 1.40, $p < 0.004$).

Conclusion:

Increased Fluoroscopy time during PCI is associated with statistically significant increased trend towards short and long term mortality. It may also lead to higher post PCI complications.

Oral Presentation – Session III

Do low glucose tolerance test results predict an increased risk of fetal growth restriction?

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Background/ significance:

Intrauterine growth retardation (IUGR) is a major source of perinatal mortality. Several studies have shown a possible link between maternal hypoglycemia and IUGR. Despite this demonstrated association the screening glucola value has not been evaluated for increased risk of IUGR. If an association is shown with the glucola challenge data this would give an additional risk indicator at no increased cost.

Purpose:

To determine if low 50 gm oral glucose challenge test (GCT) increases the incidence of IUGR in infants of pregnant women.

Methods:

Results of GCT's done through ACL lab at AWAMC and ASMC were obtained from 1/2006 to 11/2008. These were linked to the perinatal database for deliveries within four months after the value. Medical conditions known to increase risk of IUGR were excluded. Those with prior IUGR babies without other risk factors were not excluded as their metabolism of glucose may be a mechanism contributing to recurrence. Birth weights and percentage of intrauterine growth restricted babies (determined by IUGR listed in the database) were evaluated. Gestational age and birth weights will be evaluated include all IUGR infants. The groups with values below and above several GCT cutoffs (60, 70, 80) will be analysed. Statistics will be Chi square. We will compare demographics to check for confounding factors. Sub analysis by race and age will be done.

Results:

We obtained 1,587 glucola results and were able to match 1,308 results to deliveries that occurred within four months after. There were 1,200 with gestational age > 35 of which 190 were excluded due to medical condition, leaving 1,010 for analysis. For Glucola < 60 there were 12.5% IUGR vs. 3.5% for those with higher glucola (NS). For results < 70, the IUGR rate was 5.5% vs. 3.4% (NS) for those with higher glucola. Average birth weight for gestational age > 35 weeks was 2,923 gms for glucola < 60 vs. 3,315 gms for those with higher glucola ($p = 0.026$); 3,111 gms for glucola < 70 vs. 3,319 gms for those with higher glucola ($p = 0.012$).

Conclusion:

Overall listed IUGR rate was 3.4%, well below the 10% expected by definition and the 16% found at Sinai in an earlier study, suggesting significant under reporting. Initial analysis suggested lower birth weight and a trend toward higher rate of IUGR in those with lower glucola values. Further analysis will determine true rate of IUGR, look for difference between the sites, or due to race or other demographic differences, and evaluate IUGR rates at various cutoffs.

The effects of socioeconomic status and race on infant mortality rates in Milwaukee, Wisconsin

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Background/ significance:

African American infant mortality is a major public health issue in the City of Milwaukee. While Wisconsin's Infant Mortality Rate (IMR) has remained near the national average of six infant deaths per 1,000 live births, the City of Milwaukee's IMR from 2003-2007 was 15.2. Of even greater concern, however is that the African American IMR was as high as 20.5 in some ZIP codes, almost three times the state average. Research has shown that infants born in low socioeconomic areas are even higher risk of poor birth outcomes such as infant mortality. Further, some studies have found that the racial disparities in IMR were highest in higher poverty areas versus low poverty areas.

Purpose:

The purpose of this study is to investigate IMR, low birth weight and preterm birth by race and socioeconomic status in the City of Milwaukee to determine the extent of the disparities that exist. The results of this analysis may be useful at this time of limited resources by targeting the most at-risk populations to make the largest impact.

Methods:

We utilized Vila, et al's methodology to develop socioeconomic (SES) groups, which utilized Census income and education data. We obtained IMR, low birth weight and preterm birth rates by SES group and race via the Department of Health Services' WISH data query system for the time period of 2003 to 2007. We used ArcGIS to map the data outcomes.

Results:

Results show that the white IMR was 10.1, 5.9 and 5.9 for lower, middle and upper SES groups, respectively. The African American IMR was 16.4, 18 and 10.6 for lower, middle and upper SES groups, respectively. The percent of white births resulting in low birth weight was 7.2%, 7.2% and 5.7% for lower, middle and upper SES groups, respectively. The percent of African American births resulting in low birth weight was 14.2%, 13.4% and 11% for lower, middle and upper SES groups, respectively. The percent of white births resulting in preterm birth was 11.7%, 10.6% and 8.8% for lower, middle and upper SES groups, respectively. The percent of African American births resulting in preterm birth was 18.5%, 16.8% and 14.3% for lower, middle and upper SES groups, respectively.

Conclusion:

These results demonstrate that in the City of Milwaukee, African American infants born in the highest SES groups fare the same or worse than white infants born in the lowest SES groups. This finding has clinical significance in that it identifies that interventions may need to focus on African American families across all SES groups.

Complications of pulmonary fiducial marker placement prior to image-guided robotic radiosurgery

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Background/ significance:

The CyberKnife utilizes a novel technique for cancer treatment that combines image guidance technology and computer controlled robotics, which allows the system to deliver high doses of localized radiation with a high degree of accuracy. The system treats patients in single or fractionated (typically 2 to 5) sessions by delivering multiple beams of precisely directed radiation that converge upon the tumor, minimizing damage to surrounding healthy tissues. Fiducials are gold seeds implanted in and/or around the tumor to act as a radiologic landmark in order to track translational and rotational movement of the lesion. Peripheral pulmonary lesions generally require percutaneous placement of fiducials using CT or fluoroscopic guidance whereas central lesions (endobronchial or mediastinal) are effectively targeted for fiducial placement via bronchoscopy.

Purpose:

To report the complication rates of image-guided pulmonary fiducial placement for Cyberknife stereotactic radiosurgery.

Methods:

Patient and procedure data from all image-guided lung fiducial placements performed at a single institution between April 2006 and February 2007 was analyzed retrospectively. Data included patient demographics, history of tobacco use, CT findings of emphysema, lesion size, length of needle throw, quantity of fiducials placed, concomitant core biopsy, parenchymal hemorrhage, occurrence of pneumothorax and whether thoracostomy tube placement was required for treatment. Univariate and multivariate analysis was performed, and $p < .05$ was considered significant.

Results:

65 lesions were bracketed with fiducial placements in 59 patients. 40 of 65 cases (62%) resulted in pneumothorax and 14 of 65 cases (21.5%) required chest tube placement. Lesion depth was the only variable associated with increased risk of pneumothorax and chest tube placement. Pulmonary hemorrhage occurred in 30 of 65 cases (46.2%), all of these patients were treated conservatively. Variables associated with increased risk of hemorrhage as demonstrated by increasing p values, were lesion depth ($p = 0.004$), absence of smoking history ($p = 0.01$) and concurrent biopsy ($p = 0.02$). Two patients developed self limiting hemoptysis and one patient died likely from aspiration.

Conclusion:

Complication rates for fiducial placement are relatively high. Refinements in the delivery system are needed that may reduce complication rates.

Rieselbach Distinguished Paper – Session II

Effect of in-house 24 x 7 interventional cardiology team on mortality and door-to-balloon time in ST-segment elevation acute myocardial infarction

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Background/ significance:

Clinical evidence urges expeditious reperfusion in acute ST-elevation myocardial infarction (STEMI) with a goal of door-to-balloon time (DBT) < 90 minutes. In most instances, this national DBT goal is elusive and mortality in STEMI remains high.

Purpose:

We devised an innovative 24-hour, 7-day (24 x 7) in-house cardiac catheterization laboratory (CCL) program (24-hour availability of on-site interventional cardiologist and dedicated lab staff) to achieve the goal of having a DBT < 90 minutes.

Methods:

A cohort of 790 consecutive STEMI patients [69% males (n = 547), median age 61 years] presenting within 12 hours of symptom onset, was studied for survival benefit and major adverse cardiovascular events (MACE, i.e., reinfarction, stroke, and cardiogenic shock) as primary end-point after primary percutaneous coronary intervention (PPCI). Patients were divided into two groups: pre 24 x 7 (January 1, 2002 to March 31, 2004; 297 patients) and post 24 x 7 (April 1, 2004 to June 30, 2008; 493 patients). Primary PCI was used as the choice reperfusion strategy in both groups.

Results:

Median DBT decreased from 99 minutes in the pre 24 x 7 group to 55 minutes in the post 24 x 7 group (p = 0.0001). In the post 24 x 7 group, DBT was < 60 min in 58% of patients (n = 286) compared to 7% (n = 21) in the pre 24 x 7 group; p = 0.0001. MACE and in-hospital mortality correlated with increasing door-to-balloon time. In-hospital cardiac mortality was significantly reduced in the post 24 x 7 group (3%) compared to the pre 24 x 7 group (5.7%); p = 0.0239. MACE also significantly decreased from 24.6% (pre 24 x 7) to 16.9% (post 24 x 7), p=0.0390 (OR 0.68, 95% C.I = 0.488-0.951).

Conclusion:

A dedicated in-house 24 x 7 interventional cardiologist and CCL staff succeeds in breaking the current inertia in achieving the national DBT benchmark of < 90 minutes and decreases mortality in STEMI.

Rieselbach Distinguished Paper – Session II

Presented by: Tanvir Bajwa, M.D.

Impact of 24 x 7 in-hospital interventional cardiologist on door-to-balloon time in STEMI patients during regular and off hours

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Background/ significance:

Access to round-the-clock urgent primary percutaneous coronary intervention (PPCI) for ST-elevation myocardial infarction (STEMI) patients is not routinely available throughout the week at most medical centers. Admission during off hours is associated with higher door-to-balloon time (DBT) and higher mortality.

Purpose:

To overcome such logistic difficulties, we devised a 24-hour, 7-day (24 x 7) in-hospital cardiac catheterization laboratory (CCL) program (24-hour availability of on-site interventional cardiologist and dedicated lab staff) and examined its effect on DBT in patients presenting with STEMI during off-hours compared to patients presenting during regular hours.

Methods:

We prospectively collected data on a cohort of 790 consecutive STEMI patients [69% males (n = 547), median age 61 years] presenting within 12 hours of symptom onset. Patients were categorized as the pre 24 x 7 group, i.e., before the inception of the 24 x 7 program (January 1, 2002 to March 31, 2004; 297 patients), and the post 24 x 7 group (April 1, 2004 to June 30, 2008; 493 patients). DBT was compared in these two groups of patients presenting during regular hours (weekdays 7:30 a.m. to 7:30 p.m.) and off hours (weekends, holidays and 7:30 p.m. to 7:30 a.m. weeknights).

Results:

With the implementation of the 24 x 7 STEMI protocol, no difference was observed between DBT during regular hours versus off hours (63 ± 32 min and 67 ± 36 min, respectively; $p = 0.2121$). The median DBT for all acute STEMI patients (regular+off hours) in the post 24 x 7 group was 55 minute. Median DBT was 95 min in the pre 24 x 7 group during regular hours and 106 min during off hours ($p = 0.0065$).

Conclusion:

There was a significant reduction in the difference in DBT between regular hours and off hours (including weekends) with the implementation of a 24 x 7 STEMI program, i.e., round-the-clock in-house coverage by catheterization laboratory staff and an interventional cardiologist.



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