

RESEARCH SYMPOSIUM

**JUNE 12, 2014
7:00 – 10:00 a.m.**

Laros Auditorium

St. Luke's Hospital & Health Network

*Dental Residency
Emergency Medicine Residency
Family Medicine Residencies
General Surgery Residency
Internal Medicine Residency
Obstetrics & Gynecology Residency
Orthopedic Residency
Pastoral Care Residency
Pharmacy Residency
Podiatry Residency*

*Osteopathic Internship
Transitional Year Internship*

*Cardiology Fellowship
Geriatric Medicine Fellowship
Hospice/Palliative Care Medicine Fellowship
Podiatric Dermatology Fellowship
Sports Medicine Fellowship
Surgical Critical Care Fellowship
Urogynecology Fellowship*

**Sponsored by
The Research Institute
Jill Stoltzfus, PhD, Director
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ORAL PRESENTATIONS

Note: Residents' and fellows' names are bolded.

- 1) Surgeon Determined Visualization in Shoulder Arthroscopy: A Randomized, Blinded, Controlled Trial Comparing Irrigation Fluid with and without Epinephrine
Daniel Avery, MD; Brett Gibson, MD; Gregory Carolan, MD
- 2) Will I Miss an Aneurysm? The Role of CTA in Traumatic Subarachnoid Hemorrhage
Kathryn Baling, MD; Adham Elmously, BS; Brian Hoey, MD; Christy Stehly, BS; Marc Portner, MD
- 3) Inappropriate Warfarin Use in Trauma: Time for a Safety Initiative
Heidi Hon, MD; Adham Elmously, BS; Christy Stehly, BS; Jill Stoltzfus, PhD; Brian Hoey, MD
- 4) DEXA Screening in the Clinic Setting
Frank Migliore, DO; **Emily Klonoski, DO**; Cara Ruggeri, DO
- 5) Inhaled Epoprostenol in Acute Respiratory Distress Syndrome
Yinka Ojutalayo, PharmD; Peter Hlavinka, PharmD, BCPS; Jill Stoltzfus, PhD
- 6) Implementation of Sepsis Screening and Management Bundles Reduces Mortality
Marcela Perez Acosta, MD; Jennifer Axelband, DO; Diana Tarone, MSN, MBA, RN
- 7) Lactate Levels in the Acutely Ill Patient: Does the Tourniquet Falsely Elevate the Result?
Brenton Taggart, MD; John Wilson, MD; Rebecca Jeanmonod, MD; John Cipolla, MD
- 8) Evaluating the Association between Vitamin B12 Deficiency and Peripheral Neuropathy in Patients with Diabetes
Brenda Zagar, PharmD; Daniel Longyhore, PharmD, BCACP

ORAL PRESENTATION ABSTRACT

Surgeon Determined Visualization in Shoulder Arthroscopy: A Randomized, Blinded, Controlled Trial Comparing Irrigation Fluid with and without Epinephrine

Daniel Avery, MD; Brett Gibson, MD; Gregory Carolan, MD

Introduction/Background

Adequate visualization during shoulder arthroscopy is of great importance for the procedure to be efficiently and effectively performed. Dilute epinephrine in irrigation fluid has been utilized historically to help with visualization. Given the potential safety issues documented in the literature related to epinephrine use, as well as the significant improvements in technique and instrumentation over the last decade, the need for this additive should be reexamined. The objective of the current study was to compare surgeon-determined visualization in shoulder arthroscopy using irrigation fluid both with and without epinephrine.

Methodology

Eighty-three patients were randomized to receive irrigation fluid with epinephrine (n=44) or without epinephrine (n=39) during their arthroscopic shoulder procedures. After each procedure, the blinded senior author evaluated visualization based on a visual analog scale, and all clinically important procedure variables were recorded.

Demographic variables and diagnostic outcomes were compared between the epinephrine and no-epinephrine groups using separate independent samples t-tests for normally distributed continuous variables and chi square or Fisher's exact-tests as appropriate for categorical variables. To compare median visual analogue scores between groups, a Mann Whitney rank sums test was conducted. These analyses were then repeated for rotator cuff repair procedures only. For all outcomes, $p \leq .05$ denotes statistical significance, with no adjustment for the multiple comparisons. Based on a 2-point difference in VAS score which we believed would represent the smallest clinically significant difference, a minimum of 26 patients per group was required to ensure 80% power at $\alpha = .05$.

Results

Eighty-three arthroscopic shoulder procedures were included in the study. Fifty-four of these were arthroscopic rotator cuff repairs, allowing a subset analysis of this specific procedure. There was a significant difference with improved visualization in the epinephrine group versus no-epinephrine group when comparing all procedures ($p < .0001$) and when comparing only rotator cuff repairs ($p < .0001$). However, there was no statistical difference in other clinically important variables, including operative time and amount of irrigation fluid used.

Discussion and Conclusions

Irrigation fluid with epinephrine significantly improves surgeon-determined visualization in shoulder arthroscopy in general and, more specifically, in arthroscopic rotator cuff repair. However, using epinephrine did not yield a significant difference in operative time or amount of irrigation fluid used.

ORAL PRESENTATION ABSTRACT

Will I Miss an Aneurysm? The Role of CTA in Traumatic Subarachnoid Hemorrhage

*Kathryn Balinge, MD; Adham Elmously, BS; Brian Hoey, MD;
Christy Stehly, BS; Marc Portner, MD*

Introduction/Background

Computed tomography angiography (CTA) is often over-utilized in patients with traumatic subarachnoid hemorrhage (tSAH) to rule out occult ruptured aneurysm (RA) and arteriovenous malformations (AVM). We hypothesized that there are two exclusive subsets of patients with tSAH who are at increased risk for aneurysm/AVM and should therefore undergo CTA: patients “found down” with unknown mechanism of injury (MOI) and patients with central subarachnoid hemorrhage (CSH), or blood in the subarachnoid cisterns and Sylvian fissures.

Methodology

A five-year retrospective analysis was performed on trauma patients with blunt head injury and tSAH who had CTA of the head from 01/2008 to 12/2012. Our primary outcome was the diagnosis of a RA/AVM. Independent sample t-tests, chi square tests, and logistic regression were used for statistical analysis.

Results

Of 617 patients with tSAH, 186 patients had CTA. Patients’ ages ranged from 15 to 95 (mean \pm standard deviation = 57 ± 21.2); 64% were male and 36% were female. Mean admission Glasgow Coma Score (GCS) was 11 ± 5.03 and mean Injury Severity Score (ISS) was 20 ± 11.48 . Twenty-three patients (12.3%) had a RA or AVM noted on the CTA; in 8% of these patients, these outcomes were believed to be incidental. Regarding MOI in patients with a RA, 5 (62.5%) had falls and 3 (37.5%) were MVCs. Interestingly, of 14 patients “found down”, none had a RA/AVM. All 8 patients with a RA (100%) had CSH. None of the 81 patients with only peripheral SAH had a RA/AVM. Logistic regression analysis revealed that CSH was the most predictive of CTA findings regarding RA (adjusted odds ratio, 6.39; 95% confidence interval 1.32-30.83). Patients with RA had significantly higher mean arterial pressure (MAP) (mean \pm standard deviation = 116 ± 7) than those without a RA/AVM (mean \pm standard deviation = 104 ± 18), with $p < .005$. Of the 8 patients with a RA, 6 had neurosurgical clipping or coiling, 1 had a ventriculostomy, and 1 had a craniotomy for evacuation of hemorrhage.

Discussion and Conclusion

These preliminary data strongly argue for a more selective approach to screening CTAs in patients with tSAH. CTA should be utilized in patients with CSH regardless of MOI. A more selective approach should be utilized in those patients with only peripheral SAH, as cost savings would be substantial.

ORAL PRESENTATION ABSTRACT

Inappropriate Warfarin Use in Trauma: Time for a Safety Initiative

Heidi Hon, MD; Adham Elmously, BS; Christy Stehly, BS; Jill Stoltzfus, PhD; Brian Hoey, MD

Introduction/Background

Warfarin continues to be widely prescribed in the United States for a variety of conditions. Several studies have demonstrated that pre-injury warfarin may worsen outcomes in trauma patients. We hypothesized that a significant number of trauma patients are on pre-injury warfarin for inappropriate indications, with a substantial number of these patients being subtherapeutic or supratherapeutic. We also hypothesized that pre-injury warfarin would increase mortality in our trauma population.

Methodology

We conducted a 10-year retrospective review of registry data from 2004 – 2013 at a Level I trauma center. Data collected included age, Injury Severity Score (ISS), Abbreviated Injury Score (AIS) for head, mortality, hospital length of stay, indications for anticoagulant therapy, admission Glasgow Coma Score (GCS), and admission INR. Statistical differences were determined using the chi-square test for categorical variables and the Mann-Whitney rank sums test for skewed continuous variables.

Results

A total of 21,136 blunt trauma patients were evaluated by the trauma service over our 10-year time period; 1481(7%) were on warfarin. As per the American College of Chest Physician Guidelines, 264 (17.8%) of the patients were on warfarin for *inappropriate* reasons. Over 60% of these patients were non-therapeutic regarding their INR, while 41.1% were subtherapeutic and 22.2% were supratherapeutic. Overall, median hospital length of stay was significantly higher in patients admitted on warfarin (4 days versus 2 days $p < .0001$). There was also a significant increase in overall mortality in the warfarin group (6.1%, $n = 91$) versus the control group (2.6%, $n = 50$) ($p < .0001$). In patients with severe closed head injuries, there was also a significant increase in mortality in the warfarin group (26.4%, $n = 56$) versus the control group (14.9%, $n = 22$) ($p = .009$).

Discussion and Conclusion

A substantial number of our trauma patients were admitted on warfarin for inappropriate indications. In addition, a large number of trauma patients on warfarin had either subtherapeutic or supratherapeutic INRs. Our study revealed that pre-injury warfarin increased mortality and hospital length of stay in our trauma population and in our subset of closed head injury patients. Therefore, national safety initiatives directed at appropriate use and discontinuation of warfarin are necessary.

ORAL PRESENTATION ABSTRACT

DEXA Screening in the Clinic Setting

Frank Migliore, DO; Emily Klonoski, DO; Cara Ruggeri, DO

Introduction/Background

The National Osteoporosis Foundation (NOF), the USPSTF, and the American Academy of Family Physicians all recommend DEXA screening for osteoporosis in all women ages 65 and older. A T-score of -2.5 or lower on DEXA scans constitutes osteoporosis. A T-score is the bone mineral density (BMD) of a patient's standard deviation difference compared to the mean of a young adult reference population. Women with osteoporosis are at high risk for pathologic fracture, most commonly compression fracture of the vertebra and fracture of the hip. Vertebral compression fractures cause pain, loss of height, and kyphosis, and another fracture within the next year occurs at the rate of 19%. Hip fractures carry significant morbidity and mortality. In-hospital mortality rates range from 1-10%. One-year mortality rates after hip fracture range from 12-37%. Treatment options are multiple and readily available when osteoporosis is identified, and Medicare will pay for DEXA screening every 2 years after age 65. We sought to determine the rate at which DEXA screening is performed among women > 65 years of age in a clinic setting

Methodology

This was a retrospective chart review. We generated a list all female patients > 65 years of age who receive care at the Southside Medical Clinic. We then looked back 730 days into the electronic medical record to see which patients had a DEXA scan in that time period. Patients who were deceased or not receiving care at the Southside Medical Center were excluded. We presented descriptive outcomes.

Results

We reviewed a total of 389 patients, including both uninsured and underinsured patients, many with little to no education. The majority of this population is of Hispanic descent (many speaking Spanish primarily with little to no English-language skills), but others included white, African American, and Asian.

- 28.5% of all women \geq 65 years of age (n = 111/389) had a DEXA scan within the past 2 years.
- 20.8% of women 65 years of age (n = 11/53) had a DEXA scan within the past 2 years.
- 29.8% of women \geq 66 years of age (n = 100/336) had a DEXA scan within the past 2 years.

Discussion and Conclusion

More than 70% of women ≥ 65 years of age do not receive biannual screening DEXA scans. These women are at risk of having undiagnosed osteoporosis and ultimately pathologic fracture, along with the accompanying morbidity and mortality. The reasons for this low screening rate are likely multifactorial. In the clinic setting, financial constraints and patient education are always a consideration. Transportation is likely an issue as well. For now, patient education, physician education, and social work referral to help patients pay for and arrange transportation for DEXA screening is likely to improve screening rates. It is our practice at the clinic to screen women 65 years of age and older every 2 years in conjunction with Medicare reimbursement.

Only slightly more than 20% of women 65 years of age had DEXA screenings. It may be that patients who just turned 65 haven't had time to get screened. Looking at the percentage of women 66 years of age may give a more accurate number of women who are at least receiving their initial screening, whether or not they are getting rescreened. It should be noted that the interval for rescreening after initial DEXA scanning at age 65 is not defined by any guidelines. Depending on the T-score, expert opinion suggests rescreening anywhere from 2 to 15 years. This opens up possibilities for multiple studies in the future. Once the electronic medical record has been in place for 2 years, a study could determine the rate at which DEXA scans are ordered, or track women who have not had a DEXA scan for future fractures.

ORAL PRESENTATION ABSTRACT

Inhaled Epoprostenol in Acute Respiratory Distress Syndrome

Yinka Ojutalayo, PharmD; Peter Hlavinka, PharmD, BCPS; Jill Stoltzfus, PhD

Introduction/Background

Acute respiratory distress syndrome (ARDS) is defined as an onset of hypoxemia with bilateral opacities on the frontal chest radiograph. The treatment approach for ARDS is to provide supportive care while treating the underlying cause. Epoprostenol is a prostaglandin (prostaglandin I₂) used intravenously for the treatment of pulmonary hypertension. Limited data suggest that inhaled poprostenol may be useful as salvage therapy for the treatment of ARDS. The purpose of this study was to identify factors associated with 30-day mortality in patients receiving poprostenol for ARDS.

Methodology

Medical records of patients who received poprostenol from August 1, 2011 to August 31, 2013 were reviewed. Patients were excluded if they received poprostenol for pulmonary hypertension. The following data were collected: patient demographics, days before the start of poprostenol, hours on poprostenol, cumulative dose, past medical history, respiratory parameters, concurrent medications, blood glucose levels and PaO₂/FiO₂ ratio. Etiology and risk factors for ARDS were also evaluated. The primary outcome was 30-day mortality, with significant differences assessed in the cumulative medication dosage and days between diagnosis and treatment using separate Mann Whitney rank sums tests due to the skewed distributions. Additionally, a chi square test was conducted to assess significant differences in the selected concurrent medications

Results

There was no significant difference in cumulative dose (patients deceased < 30 days median [range] = 3.78 [.72 – 18.72]; patients alive > 30 days median [range] = 5.76 [1.35 – 18.36]; $p = .31$). Additionally, there was no significant difference in days between diagnosis and treatment (patients deceased < 30 days median [range] = 1 [1 – 10]; patients alive > 30 days median [range] = 1 [1 – 15]; $p = .78$). Finally, there was no significant difference for concurrent medications, as follows: beta agonists ($p = .11$), antibiotics ($p = .26$), corticosteroids ($p = .90$), neuromuscular blockers ($p = .32$), acetylcysteine ($p = .06$), and HMG-CoA reductase ($p = .19$).

Discussion and Conclusion

Although there were no statistically significant differences in selected patient variables based on 30-day mortality status, the small sample size may be at least partially responsible. However, there was a trend toward statistical significance in patients receiving acetylcysteine.

ORAL PRESENTATION ABSTRACT

Implementation of Sepsis Screening and Management Bundles Reduces Mortality

Marcela Perez Acosta, MD; Jennifer Axelband, DO; Diana Tarone, MSN, MBA, RN

Introduction/Background

Sepsis is a systemic inflammatory response to an infection that can lead to severe sepsis and septic shock. It carries a mortality rate of 25-30%. Early recognition and initiation of the Surviving Sepsis Campaign (SSC) bundle guidelines has proven effective in decreasing mortality. Therefore, we sought to evaluate a sepsis quality improvement project at our institution.

Methodology

A multi-centered sepsis quality initiative project was introduced in the emergency department, intensive care units, and general medical-surgical floors. A sepsis identification tool was instituted, and a resuscitation and management bundle (based on SSC guidelines) for patients identified with severe sepsis or septic shock was employed. Nurses, mid-level providers, residents, and physicians received education on the proper use of the screening tool and management bundles. Compliance and clinical outcome data were prospectively collected over 9 months from October 2012 to June 2013. A two-sample t-test for percentages was used to analyze the data.

Results

A total of 910 patients were screened as having the potential for severe sepsis; of these, 27% (n = 245) met severe sepsis criteria. Initial compliance for the resuscitation bundle was 17%, escalating to a maximum for 82% toward the end of the study period. Overall compliance was 57% meeting all goals of the resuscitation bundle at 6 hours. Fifty-two percent of patients identified for the management bundle met all goals of care at 24 hours, improving from an initial 17% to a maximum of 82% compliance. All-cause mortality for patients who experienced severe sepsis or septic shock was 22% over the 9-month period. An interim analysis of mortality data revealed a mortality rate of 28.2% for patients not meeting all bundle goals of care, and a 13.6% mortality rate for those patients receiving all bundle goals (p = .06).

Discussion and Conclusion

The use of a screening tool and compliance with resuscitation and management bundles improved over the study period. With perfect bundle compliance, a trend toward decreased mortality was present.

ORAL PRESENTATION ABSTRACT

Lactate Levels in the Acutely Ill Patient: Does the Tourniquet Falsely Elevate the Result?

Brenton Taggart, MD; John Wilson, MD; Rebecca Jeanmonod, MD; John Cipolla, MD

Introduction/Background

Blood lactate levels are commonly ordered in both Emergency Departments (EDs) and Intensive Care Units (ICUs). They are used to risk stratify critically ill patients and as a resuscitation end-point in sepsis. Current policy within the St. Luke's University Health Network is to draw lactate without the use of a tourniquet. This can be more difficult technically as well as more time consuming, and it may result in an extra needle stick for the patient, causing increased discomfort. Orthopedic surgical data have suggested that extremity tourniquet use may alter lactate levels. However, these data come from high-pressure tourniquets used for significant amounts of time during lower extremity surgical cases. Newer data have shown no significant difference in venous lactate levels drawn with versus without the use of a tourniquet in young, healthy volunteers. The purpose of this study was to determine if the use of a tourniquet during phlebotomy significantly alters the lactate result compared to a level drawn without the use of a tourniquet in patients of all ages in clinical practice.

Methodology

This was a prospective cohort study of a convenience sample of patients whose clinical presentation led a physician to order a lactate level. Eligible patients were identified by physicians caring for patients in the ED and ICU at a tertiary care community trauma center. Patients or their proxies were approached for enrollment in the study and written informed consent was obtained. Study lactates were obtained using a tourniquet during the draw sequence of other laboratory studies at the discretion of the treating provider. These values were sent to study investigators only. Lactate levels for clinical use were drawn as per hospital protocol with no tourniquet and reported in the electronic laboratory resulting system as per hospital standard. Time of lactate measurements and patient demographic information were recorded. The two lactate levels for each patient were compared with a Wilcoxon rank sums test, and linear correlation was used to assess overall relationship between values. The study was reviewed and approved by the institutional review board.

Results

Thirty-seven patients who were clinically ill and presented to the ED for care were consented and enrolled. The median lactate level for draws utilizing a tourniquet was 1.9 (interquartile range 1.4 – 2.6). The median level for those without a tourniquet was also 1.9 (interquartile range 1.4 – 2.8). The difference between paired lactate values was not statistically significant ($p = .76$). The linear correlation coefficient for the two values was .97.

Discussion and Conclusion

In this cohort of clinically ill patients, lactate levels drawn with and without a tourniquet were not statistically different. This is clinically relevant because of the widely held belief that tourniquet use increases lactate levels. Amending our hospital protocol to draw lactates with a tourniquet can lead to savings in nursing/technician time as well as phlebotomy materials and patient comfort. There are several limitations to this study. We did not standardize the amount of time each tourniquet was up between patients. We had few high lactate values in the data set. Similarly, the sickest patients were not enrolled due to inability to give consent. We also did not record final diagnoses or comorbidities. In conclusion, there is no statistical or clinical difference in lactate levels drawn with and without the use of a tourniquet during phlebotomy.

ORAL PRESENTATION ABSTRACT

Evaluating the Association between Vitamin B12 Deficiency and Peripheral Neuropathy in Patients with Diabetes

Brenda Zagar, PharmD; Daniel Longyhore, PharmD, BCACP

Introduction/Background

Vitamin B12 deficiency has been demonstrated to be prevalent among patients with diabetes, and it is a risk factor for developing peripheral neuropathy in the general population. However, studies describing the link between vitamin B12 deficiency and peripheral neuropathy in patients with diabetes are scarce and have produced conflicting results. Therefore, the objective of this study was to ascertain if there is an association between vitamin B12 deficiency and peripheral neuropathy in patients with diabetes.

Methodology

A total of 7,929 records were identified from January 2009 to July 2013 with a serum vitamin B12 concentration and a diagnosis of diabetes only (DO) or diabetes and peripheral neuropathy (DPN). After identification, each patient was evaluated for serum vitamin B12 concentration, methylmalonic acid concentration, presence of medications that may induce vitamin B12 deficiency, and age. The data were compared between groups for differences in vitamin B12 concentration and incidence of neuropathy using a Student t-test for continuous variables a chi square test for categorical variables. All tests were two tailed, and a p value $\leq .05$ or less was considered statistically significant. In addition, we performed subpopulation analyses based on concurrent medication use and age.

Results

Five incomplete records and 2,215 multiple records were excluded, leaving 5,709 patients for analysis (4,650 in DO and 1,059 DPN). A total of 447 patients had a documented vitamin B12 concentration ≤ 250 pg/ml (361 in DO and 86 in DPN), and neither mean vitamin B12 concentration nor incidence of vitamin B12 deficiency was significantly different between the DO and DPN groups (mean vitamin B12: 683 pg/ml versus 693 pg/ml, $p = .77$) (vitamin B12 deficiency: 361 [7.8%] versus 86 [8.1%], $p = .70$). Patients who used metformin had a significantly increased incidence of vitamin B12 deficiency (96 [12.3%] versus 351 [7.1%], $p < .0001$), but not an increased incidence of neuropathy (70 [11.6%] versus 26 [14.3%], $p = .34$). In addition, there was no difference in incidence of vitamin B12 deficiency or neuropathy in the proton pump inhibitor or histamine-2 antagonist groups. Patients ages ≥ 55 years had a significantly increased incidence of vitamin B12 deficiency (384 [8.2%] versus 63 [6.0%], $p = .02$), yet only patients ages ≥ 65 years had a significantly increased incidence of neuropathy (242 [8.2%] versus 70 [11.0%], $p = .02$).

Discussion and Conclusion

Metformin and age ≥ 55 years were associated with decreased vitamin B12 concentrations. Vitamin B12 deficiency was not found to be associated with neuropathy in patients with diabetes. However, in a subgroup analysis, vitamin B12 deficiency was associated with an increased likelihood of neuropathy in diabetic patients ≥ 65 years of age.

POSTER PRESENTATIONS

Note: Residents' and fellows' names are bolded.

- 1) Quality Improvement of Health Maintenance Screening Tests with the Implementation of Electronic Health Records
Ihab Abdelaal, DO; Kristin Jones, DO; Nicholas Crognale, DO; Nguyet-Cam Lam, MD
- 2) Nutrition Matters: Focusing on Nutrition Awareness at Southside Medical Center
Astha Agarwal, MD; Juan Pablo Perdomo Rodriquez, MD; Robert Sehgel, DO; Jill Stoltzfus, PhD; Cara Ruggeri, DO
- 3) The Importance of the Daily Assessment of Invasive Lines and Devices
Ana Aldea, DO; Frank Migloire, DO; Cara Ruggeri, DO; **Ammon Larsen, MD**
- 4) Operating Room Turnover Time in Hand Surgery: Dedicated Orthopedic Staff Increases Efficiency
Daniel Avery, MD; Kristofer Matullo, MD
- 5) Retrospective Analysis of Rapid Response (RR) and Code Blues (CB) at St. Luke's Bethlehem Campus
Samuel Besson, MD; Elisabeth Paul, MD; Priya Duggal, BS; Cara Ruggeri, DO; Jennifer Axelband, DO; Jill Schultz, RN, TNCC; Rebecca Wilde RN, BSN
- 6) Concurrent Ipsilateral Supraspinatus Weakness in Patients with Lateral Epicondylitis
Nick Caggiano, MD; Kristofer Matullo, MD
- 7) Magnetic Resonance Imaging Conditional Pacemaker: Trend-Setting Technology – A Single Center Experience
Lakshmi Chebrolu, MD; Ajay Abichandani, MD; David Prutzman, DO; Erica Masceranhas; Gene Ferretti, DO; Marcus Averbach, MD; Jamshid Shirani, MD; Darren Traub, DO
- 8) NEXUS in the Elderly Fall Patient: What is Distracting?
Daniel Evans, DO, MPH; Luis Vera, BS; John Pester, DO; Donald Jeanmonod, MD; Rebecca Jeanmonod, MD
- 9) How Well are We Using Well's?
Meaghen Finan, MD; Derick Hahn, MD; Mary Eberhardt, MD
- 10) The Effects of Abdominal Binders on Pain and Distress in Post Cesarean Section Patients: A Prospective Randomized Controlled Trial
Christin Gillier, MD (co-first author); Jennifer Myers, DO (co-first author); James Anasti, MD; Ronald Kriner, DO; Ann Constant, RN

POSTER PRESENTATIONS

Note: Residents' and fellows' names are bolded.

- 11) A Search for Novel Risk Factors for Obstetric Trauma
Angel Gonzalez, MD; James Anasti, MD; Joseph Merola, MD; Kathy Nunemacher, RN
- 12) Assessment of Family Medicine Physician Guideline Adherence in Managing Hypertensive Patients in the Outpatient Setting
Andrew Goodbred, MD; Katie Thompson, DO; Nicholas Tatalias, MD; Zhi Halbach, DO; Ana Castellanos, MD; Josh Williams, DO
- 13) Incoming Resident Perception of Competency and Knowledge Base of Basic Medical Procedure Enhanced by Procedural Workshop and Educational Material
Keith Habeeb, DO; Jennifer Axelband, DO; Jill Stoltzfus, PhD
- 14) Use of High Fidelity Simulation to Assess Patient Presentation Skills by PGY1 Emergency Medicine Residents
Regina Hart, DO; Evamarie Guerrieri, DO; Jennifer Axelband, DO; Charles Bendas, MD; Joshua Onia, BA; John Pester, DO
- 15) A Comparison of Ultrasound-Guided and Palpation-Guided Identification of Lumbar Puncture Needle Entry Site in Patients as Body Mass Index Increases
Linda Joseph, MD; Donald Jeanmonod, MD; Rebecca Jeanmonod, MD
- 16) Value of Thoracic Aortic Calcium in Prediction of Obstructive Coronary Artery Disease
Maryam Mohammadi, MD; Jamshid Shirani, MD
- 17) Laceration Length Estimation by Emergency Medicine Providers
Laura Nelson, DO; Drew Nelson, MD; Holly Stankevicz, DO
- 18) Red Blood Cell Distribution Width Variation in Sepsis: A Marker of SIRS or Bacteremia?
Marcela Perez Acosta, MD; Angel Gonzalez, MD; Jennifer Axelband, DO
- 19) Improving Osteoporosis Screening in Men: A QI Project
Yamunadevi Subramaniam, MD; Oluwaseun Odumosu, MD; Paula Bordelon, DO; Maria Ghetu, MD
- 20) Unidimensional Measurement of Epicardial Adipose Tissue Thickness Underestimates Total Cardiac Fat Volume
Huseng Vefali, MD; Jamshid Shirani, MD
- 21) Short Interval between Pregnancies: A Search for Modifiable Risk Factors
Priyanka Venkataraman, MD; Ingrid Paredes, MD; Heather Winn, MD; Jill Stoltzfus, PhD; James Anasti, MD

POSTER PRESENTATION ABSTRACT

Quality Improvement of Health Maintenance Screening Tests with the Implementation of Electronic Health Records

Ihab Abdelaal, DO; Kristin Jones, DO; Nicholas Crognale, DO; Nguyet-Cam Lam, MD

Introduction/Background

The United States Preventive Services Task Force (USPSTF) recommends that women aged 65 or older receive screening for osteoporosis by DEXA scans (Grade B). The USPSTF also recommends screening men aged 65-76 who have ever smoked for abdominal aortic aneurysms (AAA). Electronic Health Record (EHR) was launched at the St. Luke's Family Medicine Center in November 2012. Using this new system, our study sought to evaluate quality in health maintenance screening for the two markers recommended by USPSTF: osteoporosis and AAA.

Methodology

A chart review was conducted in Allscript for the six-month period of 3/12/13 to 9/1/13 to establish baseline screening for osteoporosis and AAA. Office/clinical staff, residents, and attending physicians were instructed on the USPSTF recommendations and how to properly order DEXA scans and AAA ultrasounds in Allscript monthly. After these education sessions, data were gathered from 9/2/13 to 3/2/14 to assess improvement in screening.

Results

In the pre-education period of 3/2/13 to 9/1/13, 100 patients and 90 patients were randomly selected for the osteoporosis and AAA screenings, respectively. For the osteoporosis group, 56 patients (56%) were offered/received screening. For the AAA group, 7 patients (7.7%) were offered/received screening.

After staff education, a total of 100 patients and 75 patients were randomly selected for osteoporosis and AAA screenings, respectively, for the period of 9/2/13 to 3/2/14. For the osteoporosis group, 53 patients (53%) were offered/received screening. For the AAA group, 16 patients (21%) were offered/received screening.

Discussion and Conclusion

After education was provided, screening for osteoporosis slightly decreased, but AAA screening increased. This revealed that effective education at multiple staff levels impacts screening rates. Limits to this study include the small sample size for both populations. The Family Medicine Center is new to the EHR system, which may negatively impact utilizing EHR to its full potential. Proposals for future studies include using larger sample sizes for longer time periods, as well as proper application of the EHR health maintenance flow sheet. Additional research to explore the use of the EHR system in other health maintenance screenings will also assist in our hospital network-wide effort to build a Patient-Centered Medical Home.

PRESENTATION ABSTRACT

Nutrition Matters: Focusing on Nutrition Awareness at Southside Medical Center

*Astha Agarwal, MD; Juan Pablo Perdomo Rodriquez, MD; Robert Sehgel, DO;
Jill Stoltzfus, PhD; Cara Ruggeri, DO*

Introduction/Background

Nutritional literacy can be a very important factor in various chronic medical conditions. The purpose of this study was to evaluate the knowledge base and understanding of a healthy diet in Southside medical clinic patients.

Methodology

Patients of the medical clinic who agreed to participate in this study were given a questionnaire to be completed during their visit. Thereafter, they were provided with the correct answers with the aim of giving them education regarding a balanced, healthy diet. The data collection was done from November 2013 to January 2014. English and Spanish questionnaires included six questions gathering blinded information about patient variables and six questions evaluating patients' understanding of what a healthy diet includes. A total of 265 patients participated in the study; incomplete or multiple responses (n = 55) were excluded from analysis. The same questionnaire was also given to a group of medical students and residents. Separate chi square tests of general association were conducted to measure the association between different patient variables and knowledge quality.

Results

Out of the 210 responses evaluated, quality of knowledge was as follows: 0 very poor, 10.9% poor, 15.7% fair, 50% good, and 23.3% very good. Amongst students and medical residents, 65% had very good, 28% had good, and 7% had fair knowledge. There was no statistically significant association between quality of knowledge and age ($p = .28$) or race ($p = .71$). There was a statistically significant association between quality of knowledge and gender ($p = .03$, with females demonstrating better quality of knowledge); level of education ($p = .04$, with higher education correlating with better quality of knowledge); having diabetes ($p = .03$, with diabetics having better quality of knowledge); and if patients had ever been to a nutritionist ($p = .03$, with patients who saw a nutritionist having better quality of knowledge).

Discussion and Conclusion

Our study had certain limitations, given the quality improvement design and no formal calculation of sample size. In our study, the only modifiable risk factor to improving patients' quality of knowledge was seeing a nutritionist. Hence, it may be beneficial to suggest that a discussion about diet and its effect on health be included as part of the medical curriculum and health care visits in the primary care setting. We plan to conduct future studies linking nutritional literacy to objective patient parameters (e.g., HbA1c and LDL).

POSTER PRESENTATION ABSTRACT

The Importance of the Daily Assessment of Invasive Lines and Devices

Ana Aldea, DO; Frank Migloire, DO; Cara Ruggeri, DO; Ammon Larsen, MD

Introduction/Background

Central line-associated bloodstream infections (CLABSI) and catheter-associated urinary tract infections (CAUTI) are extremely common. The purpose of this quality improvement project was to increase resident, student, and faculty awareness of the importance of the daily assessment of invasive devices. This project was inspired by a particular case of a patient on one of the resident internal medicine services. The patient was hospitalized for a month and was found to be bacteremic during the hospitalization. An intense analysis was performed during which all of the documentation regarding the patient's invasive lines was reviewed. It was determined that the daily invasive lines/devices assessment form that should be completed and signed on a daily basis had only been completed 50% of the time. The patient's bacteremia was ultimately deemed to be a CLABSI.

Methodology

Prior to the start of this quality improvement project, the residents of the Internal Medicine Residency Program were informed of the project details and what specific parts of their daily work would be evaluated. From December 16th, 2013 to March 28th, 2014, three components of the residents' work were assessed to determine whether or not tasks were successfully completed. These components included proper completion of the daily invasive line/device form, inclusion of patients' invasive lines and foley catheters on the daily sign-out sheets, and inclusion of this information in the daily progress notes. Patients from the three resident-run medicine services were included in this project. Evaluation also involved direct assessment of the patients' lines and devices to ensure that they accurately correlated with what was being documented.

Results

During the designated time period, the percentage of completion was as follows:

	Progress Note	Sign-out List	Daily Device Form	Direct Assessment
Central Lines	75.9%	96.2%	95.2%	96.2%
Foley Catheters	40.2%	87.4%	75.9%	95.4%

A hospital-wide evaluation of one random day in January of 2014 showed an 85% compliance rate for completion of the daily device form for central lines and a 98% compliance rate for foley catheters.

Discussion and Conclusion

The rate of completion of the daily device forms for central lines on the resident services was higher than that of the hospital as whole. On the other hand, the hospital-wide evaluation showed a higher compliance rate for completion of the daily device forms for foley catheters. Another area to improve upon was observed in the documentation of central lines/foleys in the patient progress notes. The assessment of patients' central lines and foley catheters is an essential part of the daily examination of patients. Proper documentation through daily device forms and progress notes is a way to ensure that the physicians and nurses are not only reminded to check all lines and devices on a daily basis, but are also prompted to consider whether or not there is a continued need for these lines and devices. By improving awareness of the importance of the daily assessment of invasive lines, the rate of CLABSIs and CAUTIs could potentially be reduced.

POSTER PRESENTATION ABSTRACT

Operating Room Turnover Time in Hand Surgery: Dedicated Orthopedic Staff Increases Efficiency

Daniel Avery, MD; Kristofer Matullo, MD

Introduction/Background

Hand surgery, in contrast to much of orthopedic surgery, stands as a unique subset of orthopedics to benefit from increased operating room (OR) efficiency. Even minimal reductions in time between cases could translate into additional scheduling of elective cases or, in a hospital setting, allow additional resources for acute care. This study was conducted to evaluate the effect of orthopedic and non-orthopedic OR staff on the efficiency of turnover time in a hand surgery practice.

Methodology

A total of 621 sequential hand surgery cases were retrospectively reviewed. Turnover times for sequential cases were calculated and analyzed regarding whether the OR staff were primarily orthopedic or non-orthopedic. OR staff's turnover times were logged into an Excel spreadsheet (Microsoft Office 2010, Redmond, VA) based on their respective grouping. Average turnover time and analysis between staff groups were compared using a Student's two-tailed t-test assuming equal variance. All analysis was conducted using SAS version 9.1.3 (Cary, NC), with $p \leq .05$ denoting statistical significance.

Results

A total of 227 turnover times were analyzed. The average turnover time with all non-orthopedic staff was 30.5 minutes; having only an orthopedic surgical tech was 31.9 minutes; having only an orthopedic circulator was 24.8 minutes; and having both an orthopedic surgical tech and circulator was 19.8 minutes. Statistical significance was observed when comparing only an orthopedic surgical technician versus both an orthopedic circulator and surgical technician, and when comparing both non-orthopedic staff versus both an orthopedic circulator and surgical technician ($p < .05$).

Discussion and Conclusion

Increasing OR efficiency is being increasingly addressed in order to increase hospital revenue or decrease OR staff costs. Turnover time is one aspect of a multifaceted solution for increasing efficiency. Our study shows that hand surgery, a unique subset of surgery with many short duration cases, can be made more efficient by utilizing orthopedic-specific staff to reduce turnover time.

POSTER PRESENTATION ABSTRACT

Retrospective Analysis of Rapid Response (RR) and Code Blues (CB) at St. Luke's Bethlehem Campus

*Samuel Bensson, MD; Elisabeth Paul, MD; Priya Duggal, BS; Cara Ruggeri, DO;
Jennifer Axelband, DO; Jill Schultz, RN, TNCC; Rebecca Wilde, RN, BSN*

Introduction/Background

Physiological signs (vitals) are a reflection of a state of homeostasis. The parameters that constitute vitals are respiratory rate, heart rate, blood pressure, temperature, and oxygen saturation. Having a system or score that correlates with a patient's level of acuity can be very useful in determining the level of care needed by the patient, as well as highlighting the current critical condition, which may require rapid intervention and stabilization of the patient. Physiological deterioration usually precedes critical illness. Abnormal early warning scores trigger a call to critical care outreach teams, who are there to help manage deteriorating patients. It is important to recognize and intervene when patients display abnormal vital signs. Having such a system gives health care providers an objective tool, rather a subjective one. The Modified Early Warning Score (MEWS) has been studied and documented extensively, and it is known to prevent Code Blues. In this retrospective study, we reviewed three months of rapid responses (RRs) at St. Luke's Bethlehem campus.

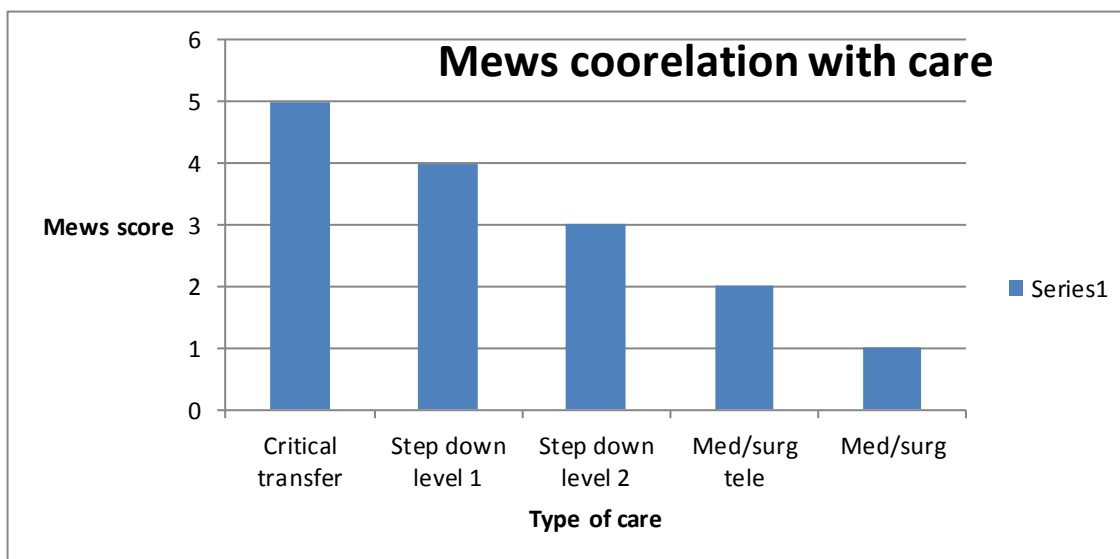
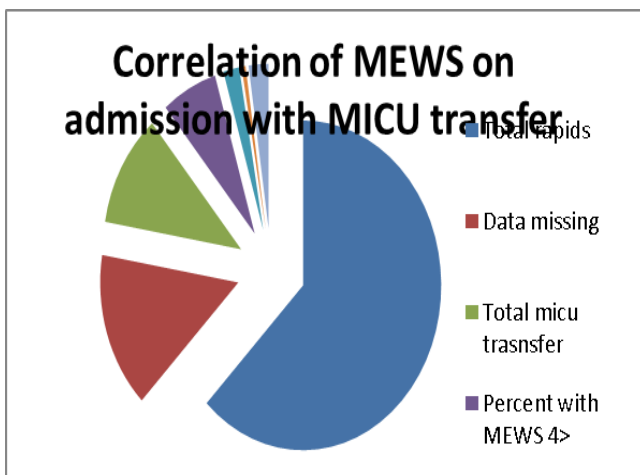
Methodology

Over a three-month period from January to March of 2014, RR data previously collected by our ICU supervisor and clinical coordinator were analyzed. The following parameters were taken into account: age, day of hospitalization, working diagnosis, reason for RRs, transfer of patients/escalation of care, code status, and deaths. The MEWS score was calculated at time of admission, as well as for the last two set of vitals prior to the RR. The primary outcome of this study was to evaluate there is an association between the MEWS score at time of admission, MEWS score closest to the RR time, and MEWS score a few hours prior to the RR. In addition, we hoped to establish a MEWS score that could assist medical staff in plan of care and help determine when to contact a critical care specialist.

Results

Mean age of patients in our study was 68 years, and average hospital stay at the time of the RR was 7.4 days. Based on our analysis, we found that the MEWS score on admission was more closely associated with deterioration of the patient at the time of the RR with subsequent need for intensive medical management. The two MEWS scores prior to the event did not show an association with RR initiation. Total number of rapid responses was 134, with incomplete data for 33 patients.

There were 24 transfers to the medical intensive care unit (MICU). Of these, 14 patients had a MEWS score of 4 on admission. Admission to specific floors or levels of care did not impact patient deterioration. The floors with the highest RR in the month of March 2014 (in descending order) were P7, P9, and P6. The most common diagnosis for RR was respiratory distress, followed by altered mental status and cardiovascular compromise (e.g., hypotension and bradycardia). Four of the 24 RR transfers were due to seizures or strokes. No association existed for strokes/seizures and MEWS score at any time. Older patients had scores of 2 or 3 on presentation, and the MEWS score preceding the RR was zero, indicating a failure to compensate prior to the RR.



Type of Care: 1 = critical care, 2 = step down level 1, 3 = step down level 2, 4 = med/surg/tele, 5 = Med surg

Discussion and Conclusion

Our study showed an association between the MEWS score on admission and initiation of RR, with a MEWS score greater than 4 on admission resulting in transfer to the MICU/ICU. There was no apparent association between the two set of vitals taken before the RR and the patient being transferred to the MICU, as they required higher levels of care. Based on our findings, it appears that the initial resuscitation of sick patients leads to their stability, which is only transient, since they are eventually admitted to the MICU. By using MEWS score on admission, intensive treatment management could be undertaken in these patients, with later transfer to the floors once they are deemed stable. For patients on P7 (a stoke floor), our study revealed no association between their deterioration and MEWS score. There were no prodromal signs/vitals prior to a stroke or seizure, making it difficult to predict patient deterioration. Hence, MEWS score cannot be safely used in these patients; instead, periodic neurological checks are more appropriate. Finally, our analysis raises a very important question: Should patients with MEWS scores greater than 4 on admission be reviewed with a critical care attending in order to intervene earlier with high-risk patients? The MEWS score could be used at any point to determine the patient's care level, but it appears most useful on admission.

POSTER PRESENTATION ABSTRACT

Concurrent Ipsilateral Supraspinatus Weakness in Patients with Lateral Epicondylitis

Nick Caggiano, MD; Kristofer Matullo, MD

Introduction/Background

Lateral epicondylitis and rotator cuff tendonosis are two of the most common upper extremity injuries seen in athletes, workers, and the general population. Each has been shown to be comparable histopathologically. Some studies have noted that each type of injury occurs in similar individuals or activities, including recent work from Titchener et al indicating that rotator cuff pathology is a significant risk factor for lateral epicondylitis. LaBan proposed that limited internal rotation at the shoulder may lead to compensatory increased wrist flexion, thereby initiating a pathokinetic chain leading to the symptoms of lateral epicondylitis.

Weakness or pain experienced while holding the humerus in an abducted position and the shoulder internally rotated indicates supraspinatus weakness. This position recreates the “palm-down lifting” position, which is also a common pain generator for those with lateral epicondylitis. Abduction of the glenohumeral joint predisposes to shearing tears in the substance of the supraspinatus. Similar shearing forces have been proven to exist in lateral epicondylitis. We hypothesized that weakness of the supraspinatus muscle leads to overloading the wrist extensors and manifests as the symptoms and degeneration seen in lateral epicondylitis. Therefore, the purpose of this study was to determine the incidence of ipsilateral supraspinatus weakness in patients with lateral epicondylitis in order to evaluate if a significant association exists between the two pathologies.

Methodology

The outpatient records of 129 patients with lateral epicondylitis were retrospectively reviewed. Charts were included if the medical record recorded examination of the elbow and strength of the rotator cuff. The incidence of isolated supraspinatus weakness with concomitant lateral epicondylitis versus lateral epicondylitis alone was noted. Demographic factors, such as age at diagnosis and gender, were also evaluated to determine possible effects. A chi square test was used to analyze the overall incidence of supraspinatus weakness and the effect of gender on our outcome variable. A one-way analysis of variance (ANOVA) was conducted to evaluate differences between age groups.

Results

A total of 83/127 patients reviewed with lateral epicondylitis met inclusion criteria; 52 of 83 patients (63%, $p < .0001$) with lateral epicondylitis had isolated supraspinatus weakness on clinical examination. Of the 52 patients with concomitant lateral epicondylitis and supraspinatus weakness, 30 were female (58%) and 22 were male (42%); 30 of the 44 included females (68%) had weakness of the supraspinatus, while 22 of the 39 included males (56%) had supraspinatus weakness. There was no significant effect of gender on incidence of concurrent supraspinatus weakness ($p = .27$). The average patient age at diagnosis was 48 years (range 21 to 68 years). The 40-49 year age group ($n = 22$, 42%) comprised the highest percentage of patients with concomitant supraspinatus weakness ($F [4,255] = 7.70$, $p < .0001$).

Discussion and Conclusion

In our sample, there was a significant association between lateral epicondylitis and ipsilateral supraspinatus weakness. We believe that a kinetic chain exists between the supraspinatus and the wrist extensors, which is a potential mechanical etiology of this association. The pain that patients with lateral epicondylitis experience with palm-down lifting may be a manifestation of the same shearing forces that cause supraspinatus pain and weakness with shoulder flexion, internal rotation, and resisted abduction.

Table 1: Age at Diagnosis of Lateral Epicondylitis

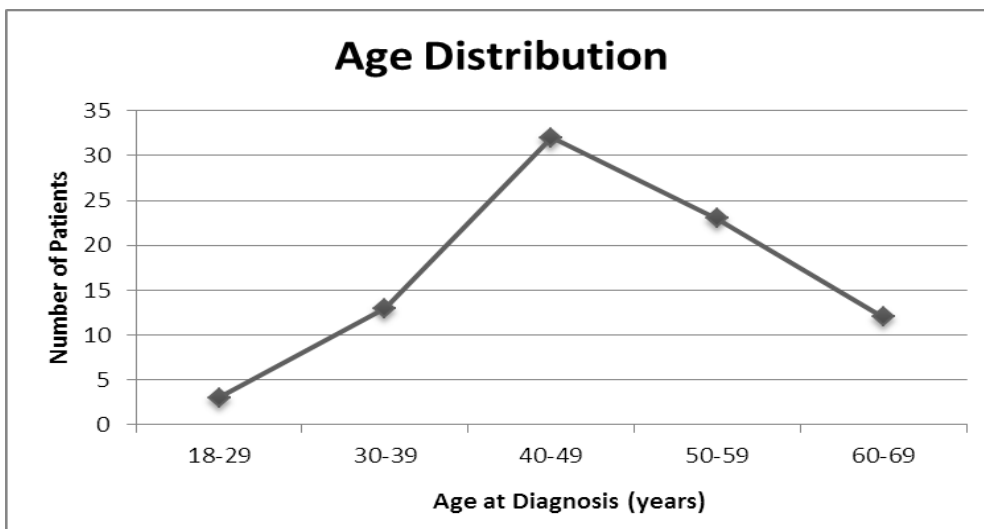


Table 2: Relative and Overall Frequencies of Ipsilateral Supraspinatus Weakness by Age

Age Group	Relative Frequency of Supraspinatus Weakness	Overall Frequency of Supraspinatus Weakness
18-29	2/3 (67%)	2/52 (4%)
30-39	6/13 (46%)	6/52 (12%)
40-49	22/32 (69%)	22/52 (42%)
50-59	13/23 (57%)	13/52 (25%)
60-69	9/12 (75%)	9/52 (17%)

POSTER PRESENTATION ABSTRACT

Magnetic Resonance Imaging Conditional Pacemaker: Trend-Setting Technology – A Single Center Experience

*Lakshmi Chebrolu, MD; Ajay Abichandani, MD; David Prutzman, DO; Erica Masceranhas;
Gene Ferretti, DO; Marcus Averbach, MD; Jamshid Shirani, MD; Darren Traub, DO*

Introduction/Background

Magnetic Resonance Imaging (MRI) provides essential diagnostic information for a variety of organ system diseases. The increasing number of cardiac implantable devices (pacemakers and defibrillators) has precluded MRI imaging in many patients. However, advances in device technology have led to the development of highly sophisticated MRI conditional (safe) devices and intracardiac leads. This study evaluated our initial experience with two of these devices (Revo-Surescan and Advisa, Medtronic Inc.).

Methodology

We retrospectively reviewed data from 92 patients who underwent implantation of MRI conditional pacemakers during the years 2011 – 2013 (52% men; mean age \pm standard deviation 65 ± 10 years; 28% diabetic; 68% hypertensive; 13% chronic kidney disease; 13% documented history of prior transient ischemic attacks and/or cerebrovascular accident). All demographic and clinical information was extracted from electronic hospital and outpatient medical records.

Results

The indications for device implantation included sinus nodal disease (SND, 43%); advanced atrioventricular nodal disease (AVND, 52%); or both SND and AVND (5%). The choice of MRI conditional device was made on the basis of current and/or projected need for future MRI evaluation of syncope (29%), seizure disorder (3%), benign cystic neural lesions (1%), neurodegenerative diseases (2%), and malignant neural tumors (4%). The overall percentage of complications (both lead related and non-lead related) was 14%. These included 4 lead dislodgements (4%) and 1 pericarditis (1%). There were no lead perforations, lead failures, or pericardial effusions. During the follow-up period, 12 patients (13%) underwent uneventful MRI imaging.

Discussion and Conclusion

Our experience indicates that MRI conditional devices can be implanted safely and that they allow ongoing needed advanced imaging in patients with chronic neurologic diseases. The advantage of implanting MRI conditional pacers, especially in patients with pertinent neurological history, was reinforced in our observational study, with 12/92 (13%) of study patients getting MRI studies for a variety of indications.

POSTER PRESENTATION ABSTRACT

NEXUS in the Elderly Fall Patient: What is Distracting?

*Daniel Evans, DO, MPH; Luis Vera, BS; John Pester, DO;
Donald Jeanmonod, MD; Rebecca Jeanmonod, MD*

Introduction/Background

NEXUS low-risk cervical spine (C-spine) criteria have been validated in elderly blunt trauma patients. However, the definition of “distracting injury” is very broad. We sought to refine the definition of “distracting injury” in the elderly fall patient.

Methodology

This was a retrospective review of geriatric patients presenting to a level 1 community trauma center that supports a fellowship in trauma/critical care. We queried our trauma database for all patients ≥ 65 years old presenting with fall from 2008 – 2013 and triaged to the trauma bay. Researchers reviewed the patients’ trauma intake paperwork to assess Glasgow Coma Score (GCS) as well as deviation from baseline mental status (MS), presence of midline neck tenderness, intoxication, focal neurologic deficit, signs of trauma, and presence of other significant traumatic injury (i.e., visceral or orthopedic). Patients were considered at baseline MS if specific documentation on the chart documented them as such or if their GCS was 15. Radiology reads for CT and MRI of the neck were the gold standard for injury. Blank data fields were conservatively estimated as positive. Data were entered into a standardized Excel spreadsheet. The institutional review board reviewed and exempted the research protocol.

Results

A total of 536 patients were enrolled. The mean/median age was 80.7/81 with a range of 65-102. Thirty-four patients (6.4%) had c-spine or cord injury; 230 (43%) had baseline MS (including GCS 13-15), no spine tenderness, no intoxication, and no focal neurologic deficit. Eleven of these patients had C-spine injury. Using physical findings of head trauma as the only “distracting injury,” 1 injury would have been missed (sensitivity/specificity 97.1/13.7). Using other traumatic injury as “distracting” did not improve the sensitivity of NEXUS and worsened its specificity (97.1/10.2, respectively). Neurologically intact patients with signs of head trauma had a relative risk of C-spine injury of 4.4 compared to their counterparts without head trauma.

Discussion and Conclusion

Our study suggests that NEXUS can be safely applied in elderly fall patients who are at their personal baseline MS. In addition, our data support a more narrow definition of distracting injury to include only patients with signs of trauma to the head and face.

POSTER PRESENTATION ABSTRACT

How Well are We Using Wells?

Meaghen Finan, MD; Derick Hahn, MD; Mary Eberhardt, MD

Introduction/Background

Pulmonary embolism (PE) has a mortality approaching 30%, with 90% of these deaths occurring in the first 2.5 hours. Given the risks and expense of computed tomography angiography (CTA) as well as the mortality of PE if missed, emphasis on ruling out the diagnosis has led to the development of clinical decision criteria. In the Emergency Department (ED), patients are individually risk stratified using these clinical decision rules, and the need for further testing is determined. We investigated whether the academic and community EDs within our health network were following clinical decision rules equally when it came to ordering D-dimer and CTAs for patients with suspected pulmonary embolism.

Methodology

This was a retrospective chart review conducted at an academic community ED with an annual volume of 70,000 and two community based EDs from the same health network with annual volumes of 51,000 and 47,000, respectively. The study was reviewed and exempted by the institutional review board. Two researchers blinded to the final diagnosis reviewed 1,513 ED charts from the period of January – December 2013 in which a D-dimer was ordered. PERC and Wells scores for each chart were calculated. D-dimer levels were recorded as well as whether a CTA was ordered. Data were analyzed using chi square tests following exclusion of patients with multiple visits (62/1,508, 4.1%) in order to satisfy the independence of observation assumption.

Results

A total of 1,446 patients were available for analysis. A total of 459/1,446 patients (31.7%) had negative PERC scores. While the academic campus ordered fewer D-dimers when the patient was PERC negative (96.4% versus 97.5% for the community EDs), this was not statistically significant ($p = .81$), with the vast majority of patients from all three campuses receiving D-dimers ($> 96.4%$) despite having negative PERC Scores. Among the 459 patients (31.7%) with negative PERC scores who received CTA, the two community EDs ordered fewer CTAs than the academic ED (21.6% and 22.8% versus 25.9%). However, there was no significant difference ($p = .67$), meaning a comparable percentage of CT scans were ordered at each campus despite patients having negative PERC scores.

When looking at patients with both low Wells scores and low D-dimers (783/1,446 patients, 54.1%), the academic ED ordered fewer CTAs (1.9% versus 4.3% and 5.3% for the community EDs), although this was not significant ($p = .12$), meaning a comparable percentage of CTAs were ordered at each campus despite patients having both low Wells Scores and D-dimers.

A total of 845/1,446 patients (58.4%) had low D-dimers. Among these patients, the academic ED ordered fewer CTAs than the two community campuses (3.2% versus 6.7% and 5.3%), although this was not statistically significant ($p = .16$).

Discussion and Conclusion

While not statistically significant, there was a trend toward ordering less testing with negative clinical decision rules in the academic ED versus the community EDs. Furthermore, while the majority of patients with negative PERC and low D-dimer/Wells scores did not receive CTA, both our academic and community EDs could have avoided up to 27% of CTAs through appropriate use of the PERC rule, and up to 5% of CTAs could have been avoided by calculating the pretest probability with the Wells criteria.

POSTER PRESENTATION ABSTRACT

The Effects of Abdominal Binders on Pain and Distress in Post Cesarean Section Patients: A Prospective Randomized Controlled Trial

*Christin Gillier, MD (co-first author); Jennifer Myers, DO (co-first author);
James Anasti, MD; Ronald Kriner, DO; Ann Constant, RN*

Introduction/Background

Abdominal binders have been shown to improve post-operative pain and distress following major abdominal surgery. The effect of abdominal binders on cesarean section recovery has never been evaluated. This study looks at the effects of abdominal binders on post-cesarean section pain and distress.

Methodology

All patients admitted to Labor and Delivery at two sites from 7/5/2013 – 11/28/13 were eligible for enrollment. Consented patients who had a cesarean section were randomized using a numbers table to receive or not receive an abdominal binder. On post-operative days 1 and 2, patients were asked to complete a pain visual analogue scale (VAS) and the validated Symptom Distress Scale (SDS). Post-operative hemoglobin and hematocrit (H/H) as well as pain medication use were also recorded. A Student's t-test was used to analyze the data.

Results

One hundred fifty patients were enrolled in the study. Demographic analysis between the two groups showed no significant difference in patient age, gravity, parity, gestational age, BMI, or ethnicity. There was no significant difference in SDS scores or H/H levels on post-operative days 1 and 2. On post-operative day 2, the VAS score was significantly less ($p = .01$) in the binder group ($n = 87$). There was no significant difference in medication use between groups except for ibuprofen use during post-operative day 2, which was significantly less ($p < .001$) in the no binder group ($n = 60$).

Discussion and Conclusion

The use of abdominal binders yielded a reduced VAS score in the binder group on post-operative day 2, but increased use of ibuprofen. There was no significant difference in patient distress between the two groups. The drop-out rate from the no binder group was much larger than the binder group, perhaps suggesting a patient preference for use of abdominal binders. Since the majority of measurements showed no significant difference, and given that there are no known disadvantages to the use of abdominal binders after cesarean section, we suggest continued offering of abdominal binders to patients.

POSTER PRESENTATION ABSTRACT

A Search for Novel Risk Factors for Obstetric Trauma

Angel Gonzalez, MD; James Anasti, MD; Joseph Merola, MD; Kathy Nunemacher, RN

Introduction/Background

Pelvic floor injury from obstetric trauma has been associated with future pelvic floor dysfunction. Thus, evaluation of women who have had a third- or fourth-degree laceration may help identify those at risk of developing pelvic floor dysfunction. Several factors such as operative vaginal delivery and median episiotomy have been shown to be risk factors for these lacerations. In this study, we attempted to search for additional risk factors for obstetric trauma.

Methodology

We identified 100 women who had a third- and fourth-degree laceration, plus 100 randomly selected women from the same time period for our control group. Parity, presence of stretch marks, pre-pregnancy body mass index (BMI), age, smoking, fetal weight, operative vaginal delivery, median episiotomy, and duration of second stage were compared between groups. Odds ratios (ORs) were calculated for each of the listed risk factors.

Results

Pre-pregnancy BMI greater than 30 kg/m² (OR 5.3, $p = .01$); fetal weight greater than 4,000 g (OR 20.7, $p < .01$); duration of second stage between 1 and 2 hours (OR 10.8, $p < .001$); duration of second stage greater than 2 hours (OR 47.2, $p < .001$); operative vaginal delivery (OR 7.81, $p < .001$); and median episiotomy (OR 26.4, $p < .001$) were associated with an increased risk of obstetric trauma. Multiparity was associated with a protective effect for obstetric trauma (OR 0.21, $p = .002$). Age, presence of stretch marks, and smoking were not significantly related to obstetric trauma.

Discussion and Conclusion

Of the listed risk factors, duration of second stage as little as 1 hour may increase the risk of obstetric trauma. This represents a potentially modifiable risk factor to decrease the risk of future pelvic floor dysfunction.

POSTER PRESENTATION ABSTRACT

Assessment of Family Medicine Physician Guideline Adherence in Managing Hypertensive Patients in the Outpatient Setting

Andrew Goodbred, MD; Katie Thompson, DO; Nicholas Tatalias, MD; Zhi Halbach, DO; Ana Castellanos, MD; Josh Williams, DO

Introduction/Background

Using METRIC for Hypertension, a quality improvement module created by the American Academy of Family Physicians, we planned to assess our residency's performance in managing hypertensive patients in the outpatient setting. There are many aspects to improve in treating patients with hypertension. However, the two measures that we tried to improve were 1) performing baseline EKGs to assess for underlying left ventricular hypertrophy (LVH), and 2) checking for proteinuria.

Methodology

We selected a non-random sample of 10 patients each from the patient panels of 6 residents and 6 attending physicians. We evaluated which of the recommended hypertensive guidelines were being met before our intervention. As a residency, we then discussed the guidelines for managing hypertensive patients, created an electronic medical record flow sheet that tracks the implementation of urinalysis and EKG, then took another non-random sample of patients after two months to see if there was any improvement in our management measures. Our main outcomes focused on improving the rate of obtaining EKG or urinalysis on the selected patients with hypertension.

Results

There were two areas in which we had a significant improvement: obtaining a baseline EKG and checking a UA to assess for proteinuria:

PARAMETER	BEFORE	AFTER	p-value*
UA for proteinuria	45% (54/120)	93% (112/120)	< .0001
EKG to screen for LVH	30% (36/120)	79% (95/120)	< .0001

** Based on separate t-tests for percentages, with $p \leq .05$ denoting statistical significance and no adjustment for the multiple comparisons.*

Discussion and Conclusion

By learning about and implementing evidence-based guidelines for the management of chronic hypertensive patients, we were able to show significant improvement in our assessment efforts for underlying LVH and proteinuria, as measured by the performance of EKG and urinalysis. We plan to continue using the METRIC module in the future as a quality improvement project in our residency for other areas in the Patient-Centered Medical Home as part of the Network-wide effort to improve patient care.

POSTER PRESENTATION ABSTRACT

Incoming Resident Perception of Competency and Knowledge Base of Basic Medical Procedure Enhanced by Procedural Workshop and Educational Material

Keith Habeeb, DO; Jennifer Axelband, DO; Jill Stoltzfus, PhD

Introduction/Background

Incoming resident physicians' education pertaining to bedside procedures, including central venous catheter (CVC) and endotracheal intubation (ETT), often occurs in an unstandardized manner leading to uncomfortable residents performing procedures. This study evaluated perceived competency and knowledge prior to and following an educational initiative comprised of instructional material, a didactic session, and a structured workshop.

Methodology

This quasi experiment was performed at a 480-bed teaching hospital. A procedural workshop was coordinated by an emergency medicine (EM) critical care physician. Residents' competencies were assessed on all skills performed during the workshop. The perception of competency was evaluated using a visual analog scale (VAS) that ranged from 0-100 (0 indicating lack of comfort and 100 representing a high comfort level). Residents' knowledge of the procedures was also assessed with a 10-question quiz administered prior to and immediately following the initiative. Data are reported as medians and raw ranges, with separate Wilcoxon signed rank tests conducted to compare pre/post-initiative changes. For all analyses, $p \leq .05$ denotes statistical significance, with no adjustment for multiple testing.

Results

Over a 4-year period, 180 medical residents undertook the procedural workshop. EM residents represented 26.7% of the participants, with 24.4% from Family Medicine, 17.8% from Internal Medicine, and the remaining 31.1% from various other specialties. The residents displayed general improvement in perception of competency in the placement of CVC (pre-initiative median [range] = 25 [0 – 97]; post-initiative median [range] = 65 [3 – 100]; $p < .0001$) and ETT (pre-initiative median [range] = 49.50 [0 – 100]; post-initiative median [range] = 80 [2 – 100]; $p < .0001$). Residents' pre/post knowledge also improved significantly (pre-initiative median [range] = 8 [2 – 10]; post-initiative median [range] = 9 [3 – 10]; $p = .003$). Finally, residents' perceptions of the educational initiative as a useful training tool improved significantly (pre-initiative median [range] = 81 [0 – 100]; post-initiative median [range] = 86 [15 – 100]; $p = .04$).

Discussion and Conclusion

Implementation of an educational initiative that included a didactic and procedural workshop coupled with an educational handbook improved both perception of procedural competence and level of procedural knowledge in resident physicians.

POSTER PRESENTATION ABSTRACT

Use of High Fidelity Simulation to Assess Patient Presentation Skills by PGY1 Emergency Medicine Residents

*Regina Hart, DO; Evamarie Guerrieri, DO; Jennifer Axelband, DO;
Charles Bendas, MD; Joshua Onia, BA; John Pester, DO*

Introduction/Background

Patient care and safety may suffer through omission of important details during the patient handoff from new residents to critical care attendings. Simulation offers advantages to healthcare educators, including the opportunity to practice critical but infrequent events and procedures in a safe environment. Despite medical school requirements to help transition new graduates into residency, increased autonomy of internship may be frightening to new residents as well as pose risks for the patient. The purpose of this study was to assess if simulation-based learning improves performance of residents in presenting patients to critical care faculty. Prior studies utilizing simulation have demonstrated benefits in various measured outcomes.

Methodology

This single-center, single-blinded study involved 11 Emergency Medicine residents in their first month of training. Participants cared for a simulated severe sepsis patient, then rated themselves on a visual-analog scale (VAS) and presented the patient by phone to the critical care attending. Participants were directly observed by a PGY-5 surgical critical care fellow through a one-way mirror. The following week, participants reviewed a standardized Situation/Background/Assessment/Recommendation (SBAR) template. They then cared for a different simulated severe sepsis patient and were evaluated by the same clinicians in the same fashion.

Results

Mean pre- and post-intervention scores demonstrated significant improvement when evaluated by the critical care attending. VAS analysis also demonstrated significant improvement when evaluated by the critical care attending, whereas no change was seen when evaluated by the critical care fellow. Interrater consistency was evaluated using an intraclass correlation coefficient (ICC). Overall, consistency was high; for pre-intervention scores, interrater consistency was 0.834 (95% CI 0.497 – 0.952). For post-intervention scores, consistency was 0.916 (95% CI 0.719 – 0.977).

Discussion and Conclusion

Simulation presents a unique venue for residents to advance their medical education in a safe environment while being observed and assessed by healthcare educators. This study focused on communication between residents and critical care attendings about critically ill patients, with statically significant improvement observed from week to week. Overall, high fidelity simulation is an effective means of providing training for residents to improve communication skills and make critical decisions in a controlled environment.

POSTER PRESENTATION ABSTRACT

A Comparison of Ultrasound-Guided and Palpation-Guided Identification of Lumbar Puncture Needle Entry Site in Patients as Body Mass Index Increases

Linda Joseph, MD; Donald Jeanmonod, MD; Rebecca Jeanmonod, MD

Introduction/Background

Success of lumbar puncture (LP) relies on correctly palpating anatomical landmarks, which can be difficult in patients with high body mass index (BMI). Ultrasound (US) has been shown to improve LP success; however, no study has looked specifically at patients with high BMIs.

Methodology

Emergency Medicine residents were instructed on US use to identify anatomical landmarks pertinent to LP. Volunteers of varying BMIs were placed in the lateral decubitus position, and LP entry sites were marked at L3/L4 and L4/L5 intervertebral spaces using ultraviolet (UV) light markers by faculty with extensive experience performing US-guided LP. This mark was considered the gold standard. Residents then used visible markers to identify LP site by palpation, and the transverse and longitudinal distance deviation from the gold standard mark were measured. Visible markers were removed, and residents then marked LP site by US with a 10 MHz-linear array probe and a GE Logic P6 US machine. The transverse and longitudinal deviations were again measured. Data were analyzed with the Wilcoxon rank sum test. The study was exempted by the institutional review board.

Results

By palpation, the mean transverse and longitudinal deviations from our gold standard were 4.4 mm (standard deviation [SD] 3.4, 95% CI 3.41- 5.39) and 8.2 mm (SD 6.6, 95% CI 6.6-10.1), respectively. With US, the mean transverse and longitudinal deviations were 7.8 mm (SD 6.5, 95% CI 5.9-9.7) and 7.1 mm (SD 5.2, 95% CI 5.6 – 8.6), respectively. At a BMI of 20.5, there were no significant differences between the transverse and longitudinal deviations by palpation compared to US. At a BMI of 28, there was a significantly smaller deviation from the gold standard by palpation compared to ultrasound (6.0 mm versus 10.8 mm; $p = .01$). There was no significant difference in deviation between longitudinal measurements ($p = .07$). At a BMI of 31.5, there was no significant difference between the transverse and longitudinal deviation by palpation versus ultrasound.

Discussion and Conclusion

As BMI increased, there was no significantly greater deviation in LP site identified by palpation versus US when compared to the gold standard. In the patient with a BMI of 28, LP sites identified by palpation were closer to the gold standard mark in the transverse distance as compared to US, but not in the longitudinal distance.

POSTER PRESENTATION ABSTRACT

Value of Thoracic Aortic Calcium in Prediction of Obstructive Coronary Artery Disease

Maryam Mohammadi, MD; Jamshid Shirani, MD

Introduction/Background

Gated, non-contrast computed tomography (CT) scans used for assessment of coronary calcium score (CAC) can also identify thoracic aortic calcium (TAC). TAC is associated with age, coronary risk factors, and CAC. It is unclear if TAC can provide incremental value over CAC for prediction of obstructive coronary artery disease (CAD).

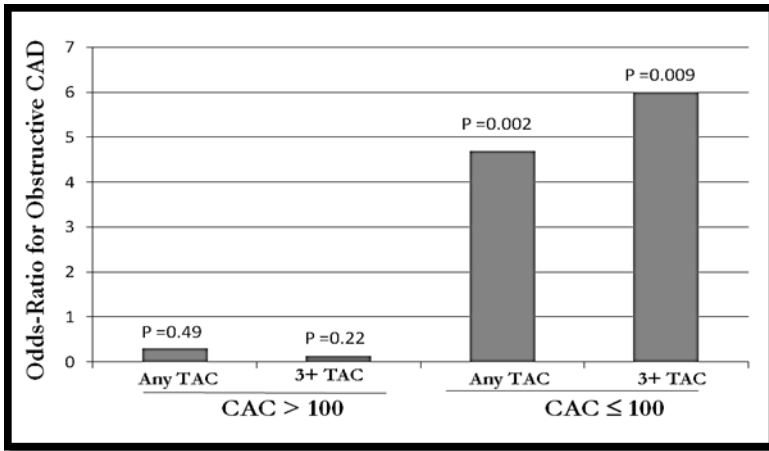
Methodology

Multi (64)-detector CT was performed in 153 adults (mean age \pm standard deviation = 51 ± 12 years, 55% women, body mass index 32 ± 7 kg/m², 55% hypertensive, 11% diabetic, 30% smoker, 48% hypercholesterolemic, Framingham risk score mean \pm standard deviation = 5 ± 6) for evaluation of suspected CAD. Thoracic aortic calcium (from pulmonary bifurcation to cardiac apex in each 2.5 mm slice) was graded on the basis of total number of calcific plaques at least 2.5 mm in length (0 = absent to 3+ = ≥ 3 plaques). Obstructive CAD was defined as ≥ 1 major coronary artery stenosis ($\geq 50\%$) on CT angiogram.

We used Cox proportional-hazards regression to estimate hazard ratios for obstructive CAD according to the presence of CAC > 100 and TAC. CAC > 100 was chosen as a cut-point due to prior reports of it being the most accurate threshold (i.e., most sensitive and specific) for predicting obstructive CAD in Electron Beam CT Angiography. We calculated the sensitivity, specificity, positive predictive value and negative predictive value for CAC > 100 in identifying obstructive CAD in our patient cohort. We also evaluated whether CAC > 100 is an independent risk factor for predicting obstructive CAD after adjustment for patient demographics. In addition, using the treating TAC score as a stratified variable (absence/presence), logistic regression was conducted to compare CAC > 100 versus CAC < 100 in predicting obstructive CAD. Analysis of data was performed using SPSS software (version 18, SPSS Inc., Chicago, Illinois), with results expressed as mean \pm SD or frequency (percent). Proportions were compared using chi-square analysis or Fisher's exact-test as appropriate. Group means were compared using Student's t-test. A two-sided p value $\leq .05$ was used to assess statistical significance.

Results

TAC was present in 50 patients (33%). Compared to those without TAC (n = 103), patients with TAC were older (63 ± 9 versus 46 ± 10), more often hypertensive (74% versus 46%) or hypercholesterolemic (68% versus 39%), had higher median (25th, 75th percentile) CAC scores (153 [9, 378] versus 0 [0, 3]), and more often had a CAC score > 100 (52% versus 13%) or > 400 (25% versus 6%). For these outcomes, all p-values were $< .01$. TAC provided no incremental value for prediction of obstructive CAD in patients with CAC > 100 (adjusted odds ratio [OR] 0.3, 95% CI 0.0 – 8.3, p = .5). However, in patients with CAC score ≤ 100 , any TAC was associated with significantly higher prevalence of CAD (adjusted OR 4.7, 95% CI 1.7 – 12.6, p = .002). This association was stronger for those with CAC ≤ 100 and 3+ TAC (adjusted OR 6.0, 95% CI 1.6, 23.4, p = .009).



Discussion and Conclusion

Presence of TAC on CT in patients with low CAC scores (≤ 100) identifies those at higher likelihood of having obstructive CAD on CT coronary angiography. TAC on non-gated CT often identifies a group of patients at higher likelihood of obstructive CAD despite low CAC scores.

POSTER PRESENTATION ABSTRACT

Laceration Length Estimation by Emergency Medicine Providers

Laura Nelson, DO; Drew Nelson, MD; Holly Stankewicz, DO

Introduction/Background

Lacerations are a common chief complaint, and laceration wound repair is routinely performed in the Emergency Department (ED). It has been observed that physicians repairing lacerations do not routinely measure but instead estimate the length visually. Incorrectly documenting laceration length due to inaccurate estimation affects physician preparation for the procedure, patient billing, and physician reimbursement. Prior studies have shown that physicians may be inaccurate at estimating laceration length on paper and with pigs' feet. Our study sought to identify the accuracy of laceration length estimation on actual patients presenting to the ED.

Methodology

This was a prospective cross-sectional survey study. A convenience sample of ED patients presenting with a skin laceration was enrolled. Patients in the trauma bay or with lacerations that required immediate closure due to hemodynamic instability were excluded. Once a patient was identified, attending physicians, resident physicians or mid-level practitioners (MLPs), and nurses documented their unaided estimation of laceration total length on a survey form. The laceration total length was formally measured in centimeters using a measuring tape, then recorded on the survey form. Secondary information, including laceration type (i.e., linear, dog ear, stellate, curved), was recorded. The recorded survey data were then entered into a standard Excel spreadsheet, with calculation of means, 95% confidence intervals, and t-tests.

Results

Fifty-five patients were enrolled. The mean measured laceration length was 2.91 cm (standard deviation [SD] 2.4 cm). Single linear lacerations were most common, representing 73% of lacerations (n = 40). Attending physicians had a mean absolute error in estimation of 0.46 cm, or 18% mean absolute error as a percent of measured laceration length. Lacerations were more commonly overestimated than underestimated. There was no statistically significant difference in estimation error between attending physicians and resident physicians or MLPs. When compared against nursing staff, attending physicians were significantly more accurate at estimation of length as a percent of the measured length: 18% versus 33% (p = .002).

Discussion and Conclusions

Attending physicians are often accurate in total laceration length estimation, averaging less than 0.5 cm of error. This error is unlikely to be clinically significant. Attending physicians are also more accurate at estimation of total laceration length when compared to nursing staff.

POSTER PRESENTATION ABSTRACT

Red Blood Cell Distribution Width Variation in Sepsis: A Marker of Bacteremia?

Marcela Perez Acosta, MD; Angel Gonzalez Rios, MD; Jennifer Axelband, DO

Introduction/Background

Red blood cells vary in size, becoming smaller as they age. They are measured by their mean corpuscular volume (MCV). The red blood cell distribution width (RDW) quantifies their variation in size. The RDW is obtained with a regular complete blood count (CBC) and has been traditionally used to further classify anemia. In the recent past, there have been studies suggesting an association between elevated RDW and worse outcomes in clinical conditions such as heart failure, pancreatitis, and coronary artery disease. Elevated RDW has also been associated with overall mortality in different infectious processes, including hepatitis B, pneumonia, and severe sepsis and septic shock. Whether this association is related to the inflammatory process or to the infection itself has not been proven. A recent study suggested that RDW is elevated in patients who are bacteremic, which has the potential use of an early marker of bacteremia.

Methodology

We conducted a retrospective analysis of the hospital course of 254 patients admitted with a diagnosis of severe sepsis at our institution between July 2012 and June 2013. We evaluated laboratory data on admission and at the moment of sepsis identification, including RDW, hemoglobin, MCV, blood cultures results, systemic inflammatory response syndrome (SIRS) markers, and hospital mortality. We assessed patients based on the normal range of RDW at our institution (between 11.6-15.2%). We sought to determine the association between RDW measurement and the presence of bacteremia, type of bacteria, and number of SIRS criteria. Secondly, we wished to determine the relationship between RDW measurement and mortality. Separate statistical analyses (independent samples t-tests and chi square tests) were conducted for exploratory purposes only, given the lack of formal sample size calculation.

Results

The RDW variation (<15.2% versus >15.2%) was very similar in the presence or absence of Gram Negative and Gram Positive bacteria ($p = .19$). The difference in mean RDW on admission by SIRS criteria (three versus four) was also not statistically significant ($p = .89$); mean RDW on admission for patients with three SIRS criteria ($n = 82$) was 15.68 ± 2.62 versus 15.62 ± 2.27 for patients with four SIRS criteria ($n = 38$).

The difference in mean RDW on admission by mortality status was not statistically significant ($p = .08$), although it trends toward significance. Deceased patients ($n = 51$) had slightly higher RDW on admission (16.34 ± 2.85) compared to alive patients ($n = 200$), whose mean RDW on admission was 15.66 ± 2.43 .

Discussion and Conclusion

Although RDW variation has been proposed as a possible early marker of bacteremia, we were not able to find a statistical difference in our studied population. The trend towards statistical significance in RDW variation and mortality should be further explored with a larger prospective study.

POSTER PRESENTATION ABSTRACT

Improving Osteoporosis Screening in Men: A QI Project

*Yamunadevi Subramaniam, MD; Oluwaseun Odumosu, MD;
Paula Bordelon, DO; Maria Ghetu, MD*

Introduction/Background

Osteoporosis is an important but often overlooked problem in men. Although the lifetime risk of hip fracture is lower in men than women, men are *twice* as likely to die after a hip fracture.

In the United States, prevalence of osteoporosis is estimated to be 7% in white men, 5% in African American men, and 3% in Hispanic men. About 13% of white men older than 50 years will experience at least one osteoporotic fracture in their lifetime.

The National Osteoporosis Foundation, The American College of Preventive Medicine, and the U.S. Endocrine Society recommend bone density testing for all women ≥ 65 years of age, all men ≥ 70 years of age, and men ages 50 – 69 years if there is an identified risk for osteoporosis.

Methodology

We collected data from DEXA scans in men ≥ 70 years of age from electronic medical records at a primary care medical center. We then calculated the 10-year probability of hip and major osteoporotic fracture using the FRAX score for all patients. Over a three-week period, and based on recommendations for osteoporosis screening in men from various medical societies, we educated physicians about the importance of osteoporosis screening in men ≥ 70 years of age. Finally, we assessed the effectiveness of our educational intervention by reviewing the number of DEXA scans ordered six weeks later.

Results

There were 86 patients included in our study. Forty three patients (50%) had a high FRAX score for hip fracture. Four patients had DEXA scans before the educational intervention over a 24-month period, while 6 patients had DEXA scans after the intervention over a 2-month period.

Discussion and Conclusion

Our study showed an improvement in screening rates among our patient population. Although the post-intervention result sample is small, we observed that only 4 men had DEXA scans over the preceding 24-month period, while 6 men received DEXA scans after our intervention. Analysis of the data was limited due to the short duration of the study and small sample size. Further studies with longer duration and larger samples are needed to assess statistical significance and draw definitive conclusions.

POSTER PRESENTATION ABSTRACT

Unidimensional Measurement of Epicardial Adipose Tissue Thickness Underestimates Total Cardiac Fat Volume

Huseng Vefali, MD; Jamshid Shirani, MD

Introduction/Background

Epicardial adipose tissue (EAT), a form of visceral fat, has been associated with coronary artery disease (CAD) risk factors, as well as directly implicated in the pathogenesis of coronary atherosclerosis. Simple unidimensional echocardiographic measurement of EAT thickness overlying the right ventricle has been advocated for quantitative assessment of cardiac fat content (CFC). We sought to determine the relation of unidimensional EAT thickness to CFC measured volumetrically by multi (64)-detector computed tomography (CT).

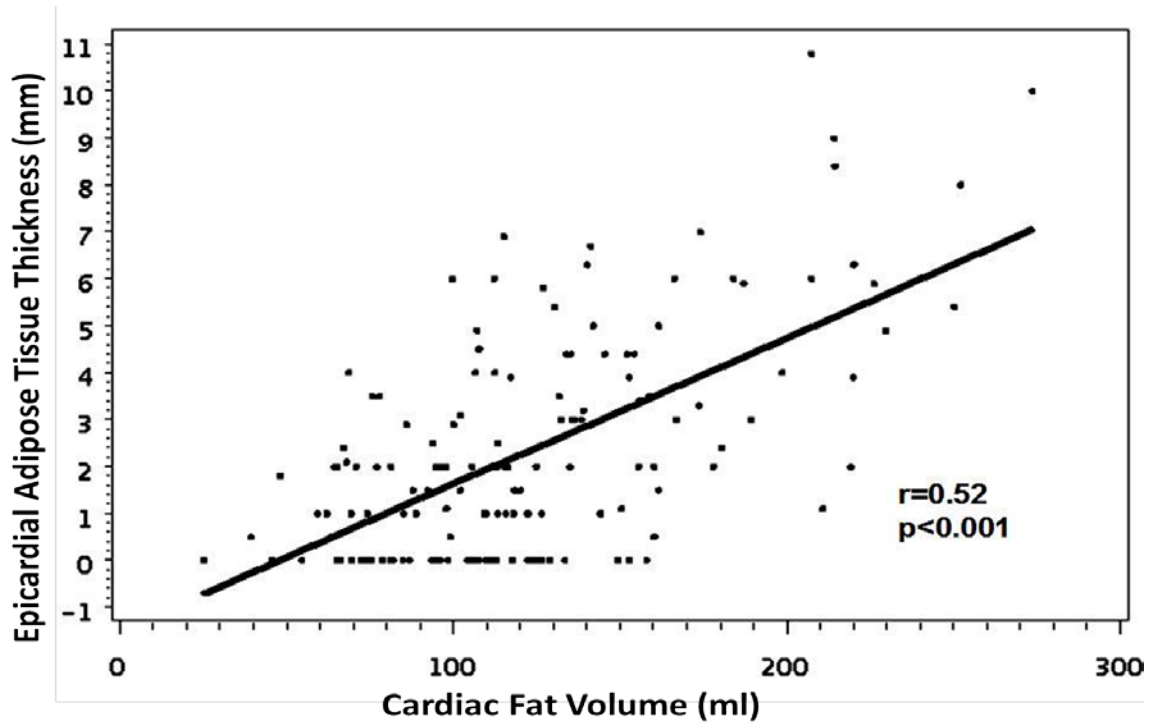
Methodology

A total of 151 adults [ages 26 – 83 years (mean \pm standard deviation = 51 ± 12), 55% men, 10% diabetic, 55% hypertensive, 48% hyperlipidemic and 31% smokers] underwent CT coronary angiography for suspected CAD. EAT thickness was measured perpendicular to the right ventricular free wall in a transverse mid-ventricular slice, and total CFC was measured by semi-automated densitometry developed in our laboratory. Briefly, using the 2.5-mm thick axial slices used for calcium scoring, we manually traced the parietal pericardium in every fourth slice starting from the aortic root to the apex. The number of slices that had to be traced manually ranged from 7 – 10 per patient. The computer software then automatically interpolated and traced the parietal pericardium in all slices interposed between the manually traced slices. Total number of slices traced manually or automatically ranged from 28 – 40 in each patient, depending on heart size. All automatically traced slices were examined and verified for accuracy. The coronal and sagittal views were used to aid in the accuracy of tracings when needed. Two histograms were then generated to depict total cardiac volume and CFC. Fat voxels were identified using threshold attenuation values of -30 to -250 Hounsfield units. Intra- and inter-observer variability for quantification of CFC was $<5\%$.

Analysis of data was performed using SPSS software (version 18, SPSS Inc., Chicago, Illinois), with results expressed as range (mean \pm standard deviation) for continuous variables and number (percent) for categorical variables. Proportions were compared using chi-square analysis or Fisher's exact test as appropriate. Group means were compared using Student's t-test. Pearson's correlation coefficients were calculated to assess the relation between EAT thickness, CFC, coronary calcium score and clinical parameters. A two-sided p value $\leq .05$ was used to assess statistical significance.

Results

EAT thickness ranged from 0 – 10.8 mm (mean 2.3 ± 2.4) and correlated positively with CFC [25 – 274 ml (122 ± 47), $r = .52$, $p < .001$]. EAT thickness also correlated positively with coronary calcium score ($r = .19$, $p = .03$) and with age ($r = .24$, $p = .003$), but not with gender, total cholesterol, high-density cholesterol, presence of hypertension or diabetes, or history of smoking. Despite statistical correlation of EAT thickness and CFC, a sizable proportion of the patients with up to 160 ml of cardiac adipose tissue showed no or minimal deposition of fat over the anterior epicardium.



Discussion and Conclusion

Simple, unidimensional measurement of EAT thickness may underestimate CFC in many patients with moderate to large increases in cardiac adipose tissue. This observation should be taken into account when designing studies that use unidimensional EAT thickness as a risk factor for CAD and its complications.

POSTER PRESENTATION ABSTRACT

Short Interval between Pregnancies: A Search for Modifiable Risk Factors

*Priyanka Venkataraman, MD; Ingrid Paredes, MD; Heather Winn, MD;
Jill Stoltzfus, PhD; James Anasti, MD*

Introduction/Background

Nearly half of the pregnancies in the United States are unintended. Non-modifiable risk factors such as poverty status, ethnicity, and age have all been identified as predictive factors for unintended pregnancies. Many of these are short interval pregnancies, which occur within 12 – 24 months of a previous delivery. It has been proven that 1 in 4 teenage mothers are likely to have a short interval pregnancy. Several studies have explored attempts at reducing repeat pregnancies, including following up with mothers or providing postpartum counseling. These attempts have been largely unsuccessful in decreasing pregnancy rates in their target populations. Our study sought a novel approach by attempting to identify modifiable risk factors for which the greatest impact can be made to reduce short interval pregnancies. This study assessed the subsequent pregnancy rates within 18 months of a delivery at St. Luke's University Hospital.

Methodology

Retrospective data were collected for hospital deliveries from the resident-staffed clinic from June of 2011 to December of 2012. Coding information and hospital documentation were used to obtain patient demographics and identify patients who returned within 18 months with a subsequent pregnancy. Data collected included age, parity, race, employment and insurance status, breast feeding at time of discharge, depoprovera injection prior to discharge, and postpartum follow up. Separate univariate analyses were conducted to determine if there were significant differences in certain demographic and clinical variables between patients with and without short interval pregnancies.

Results

Out of a total 961 deliveries, 149 (15.5%) returned pregnant within 18 months. Age, race, and postpartum visits were significantly different between groups, but the remaining variables were not. Younger patients (mean age \pm standard deviation = 26.99 ± 5.02 versus 28.84 ± 5.94 , $p < .0001$) and Hispanics (55% versus 44.5%, $p = .006$) were significantly more likely to have a short interval pregnancy. Patients who followed up for postpartum visits were significantly less likely to have a short interval pregnancy ($p = .05$).

Discussion and Conclusion

Non-modifiable risk factors, including age, poverty status, and ethnicity, have been previously identified as predictive variables for unintended pregnancies. This study identified postpartum visit as a modifiable risk factor that may reduce the incidence of short interval pregnancies. During this postpartum visit, a focused contraception discussion may decrease subsequent unintended pregnancies. Therefore, programs to increase postpartum follow-up may be worthwhile. A future study to increase postpartum follow-up is underway, which will include switching postpartum visits from the traditional six weeks to three weeks in order to increase follow-up rates.

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