

RESEARCH SYMPOSIUM

**JUNE 4, 2015
7:00 – 9:30 a.m.**

Laros Auditorium

St. Luke's University Health Network

*Dental Residency
Emergency Medicine Residency
Family Medicine Residencies
General Surgery Residency
Internal Medicine Residency
Obstetrics & Gynecology Residency
Orthopedic Residency
Pharmacy Residency
Physical Therapy 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
Jill.Stoltzfus@sluhn.org**

ORAL PRESENTATIONS

Note: Residents' and fellows' names are bolded.

- 1) Validation of the Visual Analog Score for Visualization in Shoulder Arthroscopy with Comparison to a New Grading System
Daniel Avery, MD; Vince Lands, MD; Brett Gibson, MD; Gregory Carolan, MD
- 2) STABCric: Surgical Technique against Bougie Cricothyrotomy
Jeremy Kadish, DO; Edwin Layng, MD; **Matthew Berrios, DO;** John Pester, DO
- 3) Short versus Long Intramedullary Nails for Treatment of Unstable Intertrochanteric Femur Fractures
Vamsi Kancherla, MD; Paul Morton, MD; Chinenye Nwachuku, MD; William Delong, MD
- 4) Above All, Do No Harm: Modifiable Risk Factors for High Risk Perineal Lacerations
Charles Sides, MD; Angel Gonzalez Rios, MD; Melissa Chu Lam, MD; Jill Stoltzfus, PhD; Vincent Lucente, MD
- 5) Leukocytosis Following Splenic Injury: a Comparison of Splenectomy, Embolization, and Observation
Brian Wernick, MD; Ulunna MacBean, MD; Ronnie Mubang, MD; Suzie Lui, BS

ORAL PRESENTATION ABSTRACT

Validation of the Visual Analog Score for Visualization in Shoulder Arthroscopy with Comparison to a New Grading System

*Daniel Avery, MD; Vince Lands, MD; Brett Gibson, MD;
Gregory Carolan, MD; Jill Stoltzfus, PhD*

Introduction/Background

We recently published a study supporting the use of epinephrine in arthroscopic irrigation fluid to enhance visualization in shoulder arthroscopy. Visualization was rated with a visual analogue scale (VAS), which was correlated with hematocrit in a previous study; however, using VAS for visualization in shoulder arthroscopy has never been formally validated. Therefore, our study sought to formally validate its use and compare it to a new grading scale that attempted to add more objective criteria.

Methodology and Statistical Approach

Video clips representing different levels of visualization in shoulder arthroscopy were created and randomly evaluated by six different raters who were all fellowship trained Sports Medicine orthopedic surgeons. Two separate evaluations took place rating visualization according to a VAS and a new grading system. Data was then analyzed to ascertain the interobserver reliability and intraobserver variability.

Separate intraclass correlation coefficients (ICCs) with a two-way random effects model were calculated to assess interobserver reliability (average measures) and intraobserver reliability (single measures) in the VAS and grading scales (IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp), with the objective being to determine consistency of responses rather than absolute agreement. We calculated ICCs in lieu of weighted kappa coefficients, which are commonly applied to ordinal data, because weighted kappa coefficients have some notable limitations and are therefore not universally endorsed. Using NCSS software a sample size of 6 raters with 40 observations per subject achieves 100% power to detect an ICC of at least 0.50 under the alternative hypothesis (null hypothesis ICC = 0.00), at alpha = 0.05.

Results

Using the VAS for visualization, the interobserver reliability showed a strong degree of consistency (ICC = 0.96, 95% CI = .93 - .98). Likewise, the intraobserver variability exhibited a strong degree of consistency for five of the six raters, with the ICCs ranging from .87 to .92. Using the shoulder arthroscopy grading scale, the interobserver reliability showed a strong degree of consistency (ICC = 0.97, 95% CI = .94 - .98). The intraobserver variability also demonstrated moderate to strong consistency for five of the six raters, with ICCs ranging from .61 to .90.

Discussion and Conclusion

Visualization in shoulder arthroscopy has lacked a validated measure. The results of our study show a high degree of consistency for interobserver reliability and intraobserver variability using both the VAS and the visualization in shoulder arthroscopy grading system. Both forms appear to be reliable methods for qualifying visualization.

ORAL PRESENTATION ABSTRACT

STABCric: Surgical Technique against Bougie Cricothyrotomy

Jeremy Kadish, DO; Edwin Layng, MD; Matthew Berrios, DO; John Pester, DO

Introduction/Background

Performing a surgical airway is a last-resort heroic measure when a physician cannot ventilate or intubate a patient. The current standard open surgical technique involves many steps and requires the use of multiple tools, including retractors. Each of these steps introduces an opportunity for error and increased time to securing the airway. This observational study examined whether the bougie-assisted cricothyrotomy is easier to learn and faster to perform than the classically taught open surgical method.

Methodology and Statistical Approach

This was a single-center, randomized, crossover study using pig trachea models. Participants included twelve medical students (MS3 and MS4) at St. Luke's University Hospital. Volunteers were randomized to one of the two techniques, then trained with an instructional video prior to the procedure. After a four-week washout period, the same participants were brought back to perform the other cricothyrotomy technique. The primary outcome measure was time to correct endotracheal tube placement. Secondary outcomes included time spent learning each technique and number of attempts at tube placement. Data were analyzed using SPSS version 22 (IBM Corporation, Armonk NY). Wilcoxon signed rank tests were conducted to compare time to endotracheal tube placement as well as time spent learning each technique.

Results

Median time to placement for open surgical versus bougie-assisted was 310.5 seconds (interquartile range, IQR, 235.75 – 418.5 seconds) versus 195.5 seconds (IQR 162.75 – 284.5 seconds), respectively ($p = 0.034$). Median time to learn for open surgical versus bougie-assisted technique was 339 seconds (IQR 287.25 – 436.75 seconds) versus 249.5 seconds (IQR 166.75 – 300.75 seconds), respectively ($p = 0.005$).

	Average Time For □ Tube Placement □ (seconds)	Average Video Viewing Time □ (seconds)	p value
Bougie-assisted	195.5	249.5	0.034
Open surgical	310.5	339	0.005

Discussion and Conclusion

This study demonstrated that the bougie-assisted method is quicker to learn and perform when compared to traditional open surgical cricothyrotomy. The number of attempts to achieve proper placement was not significantly different between techniques. Emergency cricothyrotomy is a time-dependent procedure often performed on a critically ill patient in whom an airway has not been secured by other methods. While there are many studies comparing the surgical technique to others, this study offers a unique addition to existing literature. We selected an inexperienced group regarding both techniques, eliminating procedure-learning bias. Additionally, this study used a crossover analysis having the same participants perform each technique, drawing a realistic comparison of both procedures. The limitations are the single-center nature and a small sample size. However, our results suggest that the bougie-assisted technique is preferred when performing an emergent cricothyrotomy. A larger, sufficiently powered study is required to verify these conclusions.

ORAL PRESENTATION ABSTRACT

Short versus Long Intramedullary Nails for Treatment of Unstable Intertrochanteric Femur Fractures

Vamsi Kancherla, MD; Paul Morton, MD; Chinenye Nwachuku, MD; William Delong, MD

Introduction

Unstable intertrochanteric (IT) hip fractures treated with short intramedullary nails (IMN) may reduce estimated blood loss (EBL), operative time (op-time), and transfusion rates, but may result in revision surgery due to a periprosthetic fracture. Long IMNs may reduce the need for revision surgery at the expense of increased EBL and op-time. Our study sought to compare short and long IMNs.

Methodology and Statistical Approach

A prospective, randomized, comparative pilot study was initiated at one institution from 2012 – 2014 that treated unstable IT fractures (OTA 31 A2.2 or greater) with either a short IMN (group 1) or long IMN (group 2). Demographics, length of stay (LOS), estimated blood loss (EBL), operative time, transfusion rate, and complications/revisions were recorded. Clinical outcomes were also assessed by visual analogue scale (VAS) scores and a SF12 health survey. A Student's t-test for parametric data and a Fisher's exact test for nonparametric (categorical) data were used to determine significance ($p < 0.05$).

Results

Group 1 (5 males, 16 females) and group 2 (1 male, 18 female) had a mean age of 86.3 and 84.1 years, respectively (Table 1). LOS, EBL, transfusion rate, and op-time for group 1 were 5.9 days, 133mL, 48%, and 42 minutes, while group 2's values were 5.3 days, 225mL, 47%, and 57 minutes (Table 2). EBL ($p = 0.01$) and op-time ($p = 0.03$) were statistically lower in group 1. Both groups had 1 perioperative death due to hypoxia (stroke in group 1, PE in group 2). Group 1 had 3 late complications, 1 periprosthetic femur fracture requiring revision surgery with a long IMN and 2 lag screw cutouts requiring conversion to total hip arthroplasty. SF12 PCS (physical component summary) and MCS (mental component summary) scores were 40/54.4 (PCS/MCS) and 40/60.7 (PCS/MCS) for group 1 and 2, respectively (Table 3). VAS scores were less than 1 for both groups.

Discussion and Conclusion

Unstable intertrochanteric hip fractures treated with short intramedullary nails may offer less surgical morbidity and increased complications when compared to long intramedullary nail fixation.

Table 1: Demographic Data

	Group 1 (Short) = 21	Group 2 (Long) = 19	p-value
Age (years)	86.3	84.1	0.49
Sex	5 males, 16 females	1 male, 18 females	
LOS (days)	5.9	5.3	0.45
Follow-Up (months)	6.7	5.7	0.66
OTA Classification	A2.2 (19), A2.3 (2), A3.1 (0), A3.2 (0), A3.3 (0)	A2.2 (11), A2.3 (4), A3.1 (0), A3.2 (0), A3.3 (4)	0.03

Table 2: Primary Outcomes

	Group 1 (Short) = 21	Group 2 (Long) = 19	p-value
Pre-op Hgb (g/dL)	10.6	11.1	0.31
Post-op Hgb (g/dL)	7.7	7.7	0.85
Delta Hgb (g/dL)	2.9	3.5	0.25
EBL (mL)	133.3	225.3	0.01
Transfusions	10 patients (48%)	9 patients (47%)	
Operative Time (minutes)	42.2	57.4	0.03
Perioperative Complications	1 hypoxia (--> death), 1 GI bleed, 1 SVT	1 hypoxia (--> death)	
Late Complications	1 periprosthetic fracture (.5 months out), 2 screw cutouts (1-2 months out)	None	
Revision Surgery	1 conversion to long nail, 2 conversions to THA	None	

Table 3: Secondary Outcomes

	Group 1 (Short) = 21	Group 2 (Long) = 19	p-value
Deaths	2	5	
Pending Survey	4	3	
Completed Survey	15	11	
F/U Interval (months)	16.3	16.7	0.92
SF12 PCS	35.7	38.5	0.46
SF12 MCS	53.6	60.3	0.03
VAS	.7	.8	0.89

ORAL PRESENTATION ABSTRACT

Above All, Do No Harm: Modifiable Risk Factors for High Risk Perineal Lacerations

*Charles Sides, MD; Angel Gonzalez Rios, MD; Melissa Chu Lam, MD;
Jill Stoltzfus, PhD; Vincent Lucente, MD*

Introduction/Background

Numerous studies have shown the adverse effects and morbidity associated with anal sphincter injuries, most notably maternal pain, flatal/fecal incontinence, embarrassment, and impaired sexual function. Lowering the cesarean section rate would likely increase the occurrence of this type of injury. More information about potential modifiable risk factors is needed to guide the clinician and decrease morbidity. In this study, we evaluated the impact of different factors in the development of anal sphincter injury.

Methodology and Statistical Approach

A retrospective case-control study was performed in patients who delivered at our institution. Two hundred ninety four patients with a third or fourth degree laceration (cases) and 7,825 patients without a third or fourth degree laceration (controls) were identified. Parity, stretch marks, age, BMI, tobacco use, fetal weight, operative delivery, and second stage duration were compared between groups, and multivariate direct logistic regression was conducted, with reporting of adjusting odds ratios (aOR).

Results

Duration of second stage between 1 and 2 hours (aOR 1.79); duration of second stage greater than 2 hours (aOR 3.1); midline episiotomy (aOR 4.01); mediolateral episiotomy (aOR 4.41); vacuum operative delivery (aOR 3.36); forceps operative delivery (aOR 7.37); and fetal weight greater than 4000g (aOR 2.07) were significant independent risk factors for high risk lacerations ($p < 0.001$). Interestingly, we did not find a statistically significant association between parity and anal sphincter lacerations.

Discussion and Conclusion

Duration of second stage, episiotomy, and operative delivery are potentially modifiable aspects of obstetric care that could impact long-term maternal morbidity.

ORAL PRESENTATION ABSTRACT

Leukocytosis Following Splenic Injury: a Comparison of Splenectomy, Embolization, and Observation

Brian Wernick, MD; Ulunna MacBean, MD; Ronnie Mubang, MD; Suzie Lui, BS

Introduction/Background

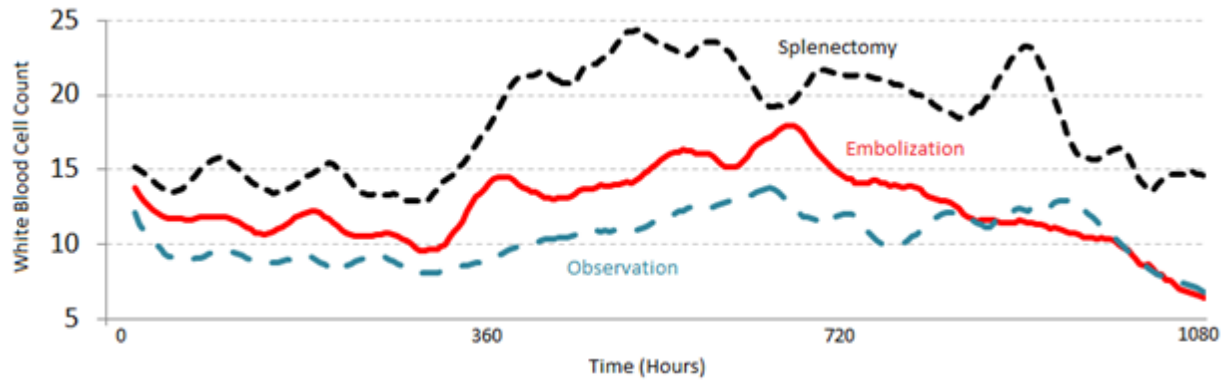
The spleen is one of the most commonly injured solid abdominal organs. Despite this fact, controversies persist about both the natural history and management of splenic injury. There is continued debate regarding the persistence of leukocytosis following both splenectomy and splenic embolization. We sought to compare the composite behavior of white blood cell (WBC) count in patients who underwent clinical observation (O), embolization (E), or splenectomy (S). We hypothesized that, when compared to observation and splenectomy, embolization would result in persistent levels of intermediate WBC elevation.

Methodology and Statistical Approach

Following Institutional Review Board (IRB) approval at participating institutions, a retrospective study of WBC behavior was conducted between March of 2000 and December of 2014. Out of all splenic injuries, a semi-random convenience sample was selected for inclusion, resulting in a representative sample of each subgroup (O, E, and S). Basic demographics and injury severity data were abstracted. Composite graphs of WBC from the time of trauma admission to the latest available WBC draw were constructed. In addition to raw WBC data, a seven-period moving average was then plotted for each group up to 1,000 hours (45 days) post-splenic injury. We also conducted analysis of variance (ANOVA) to compare subgroups.

Results

A total of 841 data points from 75 patients (20 S, 22 E, and 33 O) were studied. Median age was 39.5 years with median ISS of 19, admission GCS of 15, and 81% males. As shown in the **Figure**, during the first 30 post-injury days, the three groups separated into three distinct WBC “layers”, with the O group demonstrating the lowest composite WBC levels (11.0 ± 5.03), followed by intermediate values in the E group (13.1 ± 4.97), and persistent elevations in the S group (17.4 ± 6.84) ($p < 0.001$). During the subsequent 15 post-injury days, the WBC in O and E groups coalesced and normalized (7.67 ± 2.38 versus 7.06 ± 2.13 , $p > 0.05$), while leukocytosis continued in the S group (14.1 ± 6.33 , $p < 0.002$).



Discussion and Conclusion

Up to 30 days post-injury, both S and E were associated with significant WBC elevations compared to the O group. Elevations noted in the E group were of intermediate magnitude when compared to O and S groups. Beyond 30 days following the injury, the O and E groups coalesced, and their composite WBC levels normalized. This latter finding may represent indirect evidence that splenic embolization does not result in permanent loss of splenic function.

POSTER PRESENTATIONS

Note: Residents' and fellows' names are bolded.

- 1) Hospital Admissions for Lower Extremity Infections: Comorbidities, Procedures, and Length of Stay
Eric Bronfenbrenner, DPM; Elliot Busch, DPM; Brent Berstein, DPM

- 2) Influenza Annual Vaccine: Early versus Late Administration
Avijeet Dut, MD; Colleen Fitzgerald, MD; Helaine Levine, MD

- 3) The Dilemma: Current SIRS Criteria Applied to Obstetric Patients
Melissa Chu Lam, MD; Ingrid Paredes, MD; James Anasti, MD

- 4) Traditional Autopsy versus CT-Imaging Autopsy: a Case of “Synergistic Disagreement”
Maggie Lin, MD; Stanislaw Stawicki, MD; Noran Barry, MD; Ike Akusoba, MD; Heidi Hon, MD; Marissa Cohen, MS4; Pratik Shukla, MD; James Cipolla, MD; Brian Hoey, MD

- 5) Comparison of Transradial and Transfemoral Approach for Coronary Artery Bypass Graft Angiography and Intervention: Systemic Review and Meta-Analysis
Yugandhar Manda, MD; Jamshid Shirani, MD

- 6) Patient Hand-Off Form
Kimberly Miller, DO; Alaa-Eldin Mira, MD

- 7) Validity of the Tip Apex Distance as a Predictor of Failure in Cephalomedullary Nails: A Single Center Study
Paul Morton, MD; Anshul Agarwala, MD; Anup Gangavalli, MD; Nick Caggiano, MD; John Black, MD; William DeLong, MD

POSTER PRESENTATIONS

Note: Residents' and fellows' names are bolded.

- 8) Increasing the Incidence of Post-Code Debriefing

Stephanie Rabenold, DO; Peter Murphy, DO; Cara Ruggeri, DO

- 9) Failed Endometrial Ablation: Who Is at Risk?

Angel Gonzalez Rios, MD; Melissa Chu Lam, MD; Cori Shollenberger, MS4; Jessica Wagner, MS4; Jill Stoltzfus, PhD; James Anasti, MD

- 10) Red Blood Cell Distribution Width Variation: a Marker for Preterm Labor?

Angel Gonzalez Rios, MD; Melissa Chu Lam, MD; Matthew Zuber, MD; Marcela Perez Acosta, MD; Jill Stoltzfus, PhD; James Anasti, MD

- 11) Effect of Food Intake on Performance in Computerized Neuro-Cognitive Testing

Haidy Rivero, MD; Maheep Vikram, MD; Brian Gloyeske, MS; Jill Stoltzfus, PhD

- 12) Injuries Associated with Supracondylar Femur Fractures

David Roy, MD; Paul Morton, MD; Kirk Jeffers, MD; Patrick Brogle, MD

POSTER PRESENTATION ABSTRACT

Hospital Admissions for Lower Extremity Infections: Comorbidities, Procedures, and Length of Stay

Eric Bronfenbrenner, DPM; Elliot Busch, DPM; Brent Berstein, DPM

Introduction/Background

Hospital length of stay (LOS) has been examined for links to patient satisfaction, hospital costs, and comorbidities. Patients admitted to hospitals for lower extremity infections (LEI) experience great variability in LOS. Although numerous studies have looked at the effect of diabetes (DM), peripheral vascular disease (PVD), and other factors' influences on LOS, a literature review found no studies examining LEI LOS. The objective of this study was to describe factors that may affect LOS for patients with LEI in a multicenter university hospital network.

Methodology and Statistical Approach

We conducted a retrospective chart review. During a one-year period, 252 patients were admitted to the hospital network by foot and ankle surgeons for LEI. After discharge, LOS was recorded in days. Patients were then retrospectively grouped by (1) age in decade; (2) pre-existing presence of DM, PVD, having both diseases or neither disease; (3) whether patients required amputation, debridement, or incision and drainage, or any combination of these procedures during the stay; (4) undergoing angiogram or LE bypass during the stay; and (5) admission day of the week. We reported descriptive statistics.

Results

The mean LOS for LEI was 6.3 days. Patients with both DM and PVD had a mean LOS of 8.8 days compared to approximately 6 days if they had either PVD or DM. Patients requiring any combination of podiatric surgery had a mean stay of 9.6 days compared to approximately 6 days if they only required 1 procedure. Patients undergoing an angiogram stayed 8.8 days, while patients undergoing LE bypass stayed 13.1 days. Among age groups, patients aged 60-69 years had the longest mean LOS (7.3) while patients < 40 years of age had the shortest (4.0). Patients admitted towards the end of the week had a slightly longer LOS.

Discussion and Conclusion

This retrospective chart review gives insight into some of factors that can influence a patient's hospital stay for LEI. LOS in relation to age revealed a bell-shaped curve of distribution. It is unclear if age alone led to this result, or if it was simply a reflection of increased comorbidities in older decades of life. Patients diagnosed with both DM and PVD had longer LOS by approximately 2 days, regardless of interventions performed while in house. Performance of any single podiatric procedure did not appear to alter LOS. However, for multiple procedures, there was a marked increase in LOS. Vascular interventions also had larger increase in LOS, which is expected given that each procedure requires at least a day. Logically, patients requiring only IV antibiotics without any further intervention experienced the shortest LOS. Admissions occurring on a Thursday, Friday, or Saturday increased expected LOS by about one day. This may be due to limited interventions over the weekend or a reflection of continuity of care. This chart review illustrates the more common features of a patient with LEI requiring hospitalization. We hope to collect data over multiple years in order to conduct inferential statistical analyses and hopefully help streamline medical plans by giving both patients and physicians a better sense of the expected hospital course.

POSTER PRESENTATION ABSTRACT

Influenza Annual Vaccine: Early versus Late Administration

Avijeet Dut, MD; Colleen Fitzgerald, MD; Helaine Levine, MD

Introduction/Background

The best approach for reducing influenza-related morbidity and mortality is to prevent influenza by actively immunizing all individuals greater than six months of age. Immunocompetent adults are predicted to develop immunity to vaccine strains two weeks after vaccine administration, while children take longer to develop immunity. Based on published local, regional, and national influenza activity data and development of immunity following vaccination, practitioners in New Jersey should strive to get patients immunized before mid-November and should continue to offer vaccines through April. Centers for Disease Control (CDC) data show that as of early November of the last two flu seasons, more than half of Americans had not yet received a flu vaccination and lacked the protection it offers.

Methodology

This retrospective cohort study explored timeliness of influenza vaccine administration at a residency-based family medicine outpatient practice, Coventry Family Practice (CFP). Bill dates for patients over two years of age during the 2013-14 and the 2014-15 influenza seasons were obtained via searching for ICD-9 influenza billing codes and analyzed for month of administration.

Results

For all age groups, the percentage of visits where flu vaccine was administered varied little between the 2013-14 and 2014-15 seasons. In all child age groups, less than half of the total number of flu vaccines was given before November 1st in both years. In the 19-64 year age group, slightly more than half of the total numbers of flu vaccines was given during the early vaccination season in both years. In the > 65 year age group, 43% of all flu vaccines were given during the early vaccination season in 2013-14, but this rose to 61% in 2014-15. In all child and adult age groups in both years, large numbers of influenza immunizations were given after flu season had started, but few were given after the peak of flu activity when flu risk remains high.

Discussion

Based on this exploratory study, CFP should expand its investigations into timeliness of influenza administration in high-risk groups. Strategies will be developed and implemented that enable early vaccine season access to flu vaccine for more patients of all ages and that increase flu vaccine availability for those who come later in the season.

POSTER PRESENTATION ABSTRACT

The Dilemma: Current SIRS Criteria Applied to Obstetric Patients

Melissa Chu Lam, MD; Ingrid Paredes, MD; James Anasti, MD

Introduction/Background

Maternal sepsis is an infrequent but important complication of pregnancy, childbirth and the puerperium. It is estimated that puerperal sepsis causes at least 75,000 maternal deaths every year, mostly in low-income countries. Studies from high-income countries report maternal morbidity incidence due to sepsis of 0.1-0.6 per 1000 deliveries. A study published in October 2013 reported that severe sepsis and sepsis-related deaths are actually rising in the U.S, and delay in diagnosis and treatment increases maternal sepsis-related deaths. The normal physiologic changes in pregnancy likely contribute to the delayed recognition of sepsis

The American College of Chest Physicians/Society of Critical Care Medicine define sepsis as a Systemic Inflammatory Response Syndrome (SIRS) secondary to infection (culture-proven or visible) with 2 of the following 4 criteria required to be present: temperature $> 38^{\circ}$ (100.4° F) or $< 36^{\circ}$ (96.8° F); respiratory rate (RR) > 20 breaths per minute or $PCO_2 < 32$ mm Hg; heart rate (HR) > 90 beats per minute; or white blood count (WBC) $> 12 \times 10^9$ cells/L, or $< 4 \times 10^9$ cells/L, or bands $> 10\%$. Recently, the Modified Early Warning System (MEWS) was developed as a tool to identify patients who are at risk for catastrophic decompensation. However, because of demographic and physiologic differences between obstetric patients and the general population in which SIRS and MEWS were developed, it is not certain if these scoring systems are applicable to obstetric patients. In this study we aimed to describe how many postpartum patients in our institution with no suspicion of infection would meet SIRS criteria.

Methodology and Statistical Approach

Using a retrospective chart review, we collected temperature, heart rate, respiratory rate, and WBC from 200 postpartum patients and calculated the percentage that would meet SIRS criteria as previously defined (both individual percentages for each SIRS criterion category and the overall percent of patients who met the SIRS criteria).

Results

Our postpartum patients had a mean temperature of 98.2° F, heart rate of 78.5, and WBC of 14.3; the median RR was 20 (due to its skewed distribution). Individual SIRS category frequencies revealed 0/200 patients with temperature $> 38^{\circ}$ C (100.4° F); 1/200 (.5%) with temperature $< 36^{\circ}$ C (96.8° F); 29/200 (14.5%) with HR > 90 beats/minute; 1/200 (.5%) with RR > 20 breaths/minute; 136/200 (68%) with WBC $> 12 \times 10^9$ cells/L; and 0/200 with WBC $< 4 \times 10^9$ cells/L. A total of 26/200 patients (13%) had > 2 SIRS criteria.

Discussion and Conclusion

Our study revealed poor specificity of SIRS criteria in our obstetrical population. The physiologic changes of pregnancy in the postpartum period often result in higher heart rate and WBC count compared to non-pregnant healthy adults, which overlaps with SIRS criteria. Additional tools are to predict sepsis in pregnant women in order to reduce sepsis related mortality in this patient population.

POSTER PRESENTATION ABSTRACT

Traditional Autopsy versus CT-Imaging Autopsy: a Case of “Synergistic Disagreement”

Maggie Lin, MD; Stanislaw Stawicki, MD; Noran Barry, MD; Ike Akusoba, MD; Heidi Hon, MD; Marissa Cohen, MS4; Pratik Shukla, MD; James Cipolla, MD; Brian Hoey, MD

Introduction/Background

Decreasing traditional autopsy rates have produced a crisis in key areas of medicine, including traumatology. Other affected areas include medical education and quality improvement. To help remedy this negative trend, a number of imaging autopsy initiatives were conceived, including the CATopsy project at our institution. While the concept is promising, little is known about the correlation between traditional (TA) and imaging autopsy (IA) findings. We examined the congruence between TA and IA in a group of trauma fatalities, hypothesizing that there would be moderate amount of agreement between them.

Methodology and Statistical Approach

Following institutional review board (IRB) approval, we conducted a prospective, observational study of TA versus IA at our Level I Trauma Center between June of 2001 and May of 2010. All decedents in the current study underwent a post-mortem, whole-body, non-contrast computed tomography (CT), “a pan-scan” that was interpreted by an independent, board-certified radiologist who specializes in CT imaging. A fully independent TA was also performed by a board-certified pathologist. Autopsy findings were grouped into previously defined categories. Comparisons of TA and IA included graphical representation of findings and computation of the degree of agreement (kappa coefficient). Chi-square testing was also used to identify which modality detected potentially fatal findings more frequently in each defined category.

Results

Twenty-five trauma decedents (19 blunt; 9 female), with a median age of 32.5 years, had a total of 435 unique findings on either IA or TA. A total of 34 categories of findings were analyzed. Overall, agreement between IA and TA was worse than what chance would predict (kappa = -.58). The greatest agreement was seen in injuries involving axial skeleton and intracranial/cranio-facial trauma. Most disagreement occurred in soft tissue, ectopic air, and incidental findings. Potentially fatal findings were found on both TA and IA in 48/435 (11%) instances, 79/435 (18%) on TA only, and 73/435 (17%) on IA only. The findings reveal disproportionate categories, with one modality more frequently identifying potentially fatal outcomes in a defined category than the other. TA identified more potentially fatal findings related to solid organ injury and heart/great vessels, while IA revealed more incidental/procedure-related and ectopic air/fluid findings.

Discussion and Conclusion

Our study does not support substitutive use of non-contrast CT-based IA. However, our findings suggest that the two types of post-mortem evaluation may be complementary (and thus synergistic) when performed together. Further research is required in this important area of investigation, focusing on applications of IA in medical education and quality improvement in the absence of TA.

POSTER PRESENTATION ABSTRACT

Comparison of Transradial and Transfemoral Approach for Coronary Artery Bypass Graft Angiography and Intervention: Systemic Review and Meta-Analysis

Yugandhar Manda, MD; Jamshid Shirani, MD

Introduction/Background

The transradial (TR) approach for coronary artery angiography and intervention is gaining popularity and is associated with reduced morbidity and mortality in comparison to the transfemoral (TF) approach. However, the safety and effectiveness of TR approach in this setting is not well studied. Therefore, we conducted a meta-analysis to investigate this issue.

Methodology and Statistical Approach

We performed a systemic review of the literature and identified one randomized controlled trial and six observational studies (N = 1370) that specifically addressed this issue. We then performed meta-analysis using Review Manager (RevMan version 5.3, The Nordic Cochrane Centre, The Cochrane Collaboration, Copenhagen, Denmark) to compare the characteristics and outcomes of each approach, including vascular access site complications, major adverse cardiovascular events (MACE), access site crossover rates, fluoroscopy time, procedure time, and contrast volume use. We analyzed the data using both fixed and random-effects models, which yielded similar results. Between-study heterogeneity as measured by the I^2 statistic was 0%.

Results

Baseline patient characteristics were similar in both groups. Compared with the TF approach, the TR approach was associated with decreased risk of vascular access site complications (1.4% versus 3.8%; odds ratio [OR]: 0.34, 95% CI: 0.16 to 0.75; $p = 0.008$) and a tendency towards lower MACE (2.39% versus 4.7%; OR 0.57, 95% CI: 0.25 to 1.3; $p = 0.18$). There was no significant difference in rates of major bleeding (0.17% versus 0.57%; OR 0.65, $p = 0.58$) or in-hospital death (0.29% versus 0.7%, OR 0.58, $p = 0.54$). The risk of vascular access site cross over rate was high in the TR approach (5.16% versus 0.4%; OR: 6.31, $p = 0.0003$). The TR approach was associated with fluoroscopy time, procedure time, and contrast volume usage that were comparable to the TF approach ($p = 0.22$, $p = 0.13$, and $p = 0.84$, respectively).

Figure 1a. Risk of vascular access site complications

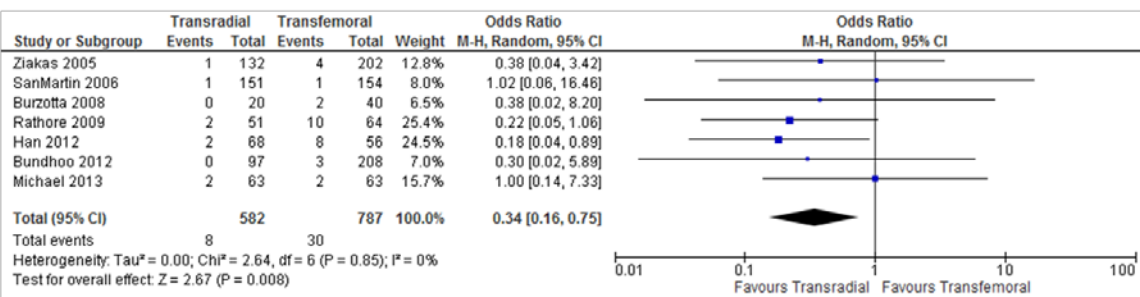
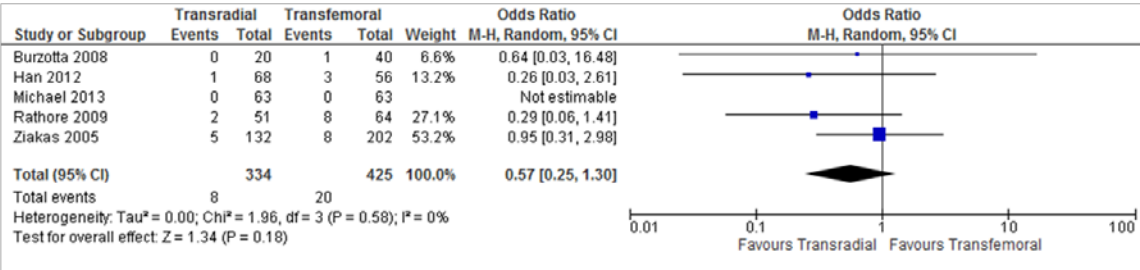


Figure 1b. Risk of major adverse cardiovascular events (MACE)



Discussion and Conclusion

The transradial approach for bypass graft angiography and intervention reduces vascular access site complications and has comparable fluoroscopy time and contrast volume usage.

POSTER PRESENTATION ABSTRACT

Patient Hand-Off Form

Kimberly Miller, DO; Alaa-Eldin Mira, MD

Introduction/Background

Patient transfer of care in the nursing home is fraught with difficulty. Medical professionals at long term care (LTC) facilities are called upon to give complex medical histories and medication lists when transferring care between medical professionals at a LTC facility and when transferring a patient from a LTC facility to the hospital. On average, there are more than two medication errors every time a patient is transferred to the hospital from a LTC facility, based on 758 transfers with 142 medication errors. The average amount of medications for a patient 64-69 years old is 14 prescriptions per year. For patients 80-84 years old, the average number of prescriptions is 18 per year. A medication error is now included in the top 5 reasons for patient mortality. The cost of medication error in nursing homes is estimated to be \$4 billion. Reducing these errors would bring down costs as well as decrease morbidity and mortality.

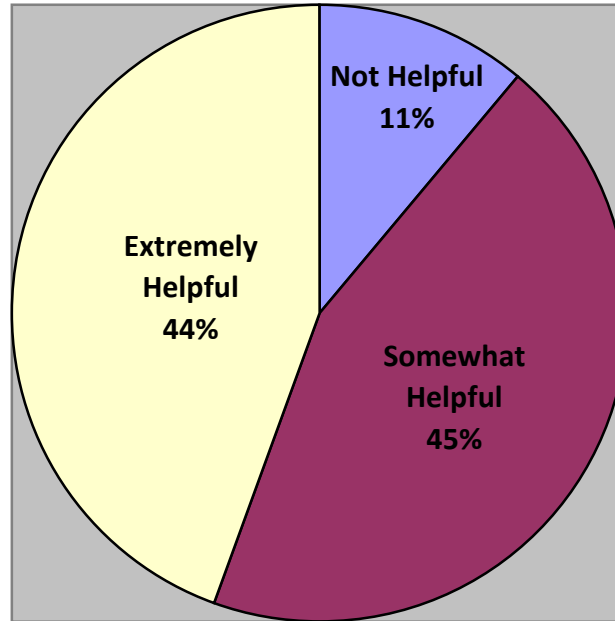
Our study objective was to develop and implement a form for transfers of care to improve communication among medical professionals in a LTC facility, with the form providing relevant medical history, medication history, functional capacity, and recent labs, as well as educating medical professionals at a LTC about the importance of this information in reducing medication errors.

Methodology and Statistical Approach

This was a quality improvement study that took place at Holy Family Manor. The new form was placed in the chart for all patients at the LTC documenting medical history, medication history, functional capacity, and recent labs. The medical professionals were educated about this form. The form was updated by the physician after seeing the patient. After a month, the medical professionals in the LTC facility were surveyed about their experiences using the form.

Results

A total of 75% of the LTC nurses completed the survey. A total of 60% used the form, with 45% finding the form somewhat helpful, and 44% finding the form extremely helpful. In contrast, 11% did not find the form helpful (see figure below).



Discussion and Conclusion

Implementing a patient hand-off form in a LTC facility, with information about the patient's medical conditions, medical history, and functional status, improved communication among the majority of its medical professionals.

POSTER PRESENTATION ABSTRACT

Validity of the Tip Apex Distance as a Predictor of Failure in Cephalomedullary Nails: A Single Center Study

*Paul Morton, MD; Anshul Agarwala, MD; Anup Gangavalli, MD; Nick Caggiano, MD;
John Black, MD; William DeLong, MD*

Introduction/Background

Orthopedic surgeons are always seeking the most effective strategies to fix hip fractures. Since the 1960s, fixed angle sliding hip screws have been a gold standard. Baumgaertner's landmark article demonstrated that the Tip Apex Distance (TAD) measured on x-ray following fixation with fixed angled sliding hip-screws estimates the possibility of lag screw cut-out, which leads to significant disability. The goal of this study was to evaluate the use of the TAD measurement in hip fractures fixed with cephalomedullary nails.

Methodology and Statistical Approach

This was a retrospective review of SLUHN orthopedic surgery patients. All patients over age 18 treated with cephalomedullary nails with at least 3 months of follow up were included. Patients were excluded for inadequate films, incomplete data, different implant, prior hip fracture, or pre-existing deformity. Patients were evaluated for demographics, treatment characteristics, and radiologic findings.

Basic statistical analysis was conducted using chi square, Kruskal Wallis and Mann Whitney rank sums test as appropriate to describe the patient population and treatment outcomes. Statistical significance was defined as $p \leq 0.05$.

Results

A total of 677 femur fractures were initially retrieved, of which 235 met inclusion criteria. There were 183 implants with a TAD ≤ 25 mm and 52 patients with a TAD > 25 mm. There were 12 implants with cutout, 5 patients who required revisions for non-union, and 3 patients with breakage of implants. The mean TAD was 23.51 ± 10.10 mm for implants that cutout; 21.30 ± 9.37 mm for breakage; 13.35 ± 4.77 mm for non-union; and 20.10 ± 7.77 mm for implants that went on to successful union. Implants with a TAD > 25 mm were significantly more likely to have cutout occur (13.5%) compared to those with TAD ≤ 25 mm (2.7%) ($p = 0.002$).

Discussion and Conclusion

Within our cohort of cephalomedullary nails, the TAD value > 25 mm clearly demonstrated a higher likelihood of lag-screw cutout. This study adds to the body of evidence demonstrating that surgeons placing a cephalomedullary nail should aim for a lag screw TAD ≤ 25 mm intraoperatively.

POSTER PRESENTATION ABSTRACT

Increasing the Incidence of Post-Code Debriefing

Stephanie Rabenold, DO; Peter Murphy, DO; Cara Ruggeri, DO

Introduction/Background

In World War II, General George Marshall believed debriefing would lead to improved tactics and battle strategy. He was right, but something else happened that he did not expect: His soldiers also had increased morale, spiritual healing, and confidence. Debriefing has revealed worthwhile benefits such as decreasing the stress response, improved psychological outcomes, and improving performance in future stressful situations. For these reasons, debriefing eventually made its way from the battlefield to aviation industries, and more recently, to hospital floors. The University of Chicago demonstrated that debriefing along with automated defibrillator feedback led to improved resuscitation and a 33% increase in return of spontaneous circulation (ROSC).

While many studies have tested the effectiveness of debriefing, fewer have addressed ways of increasing its rate of completion after code blue events. In fact, to our knowledge, there are currently no published studies that address increasing code debriefing completion. It stands to reason that if debriefing leads to benefits, increasing the rate at which debriefing occurs would likely be beneficial. While being able to debrief after every code blue event in the hospital setting is likely difficult to achieve due to the inevitable overlapping emergencies, increasing its rate is possible. Over the last two years, we attempted to improve the rate at which debriefing occurs on our hospital floors during resident-run code blue events.

Methodology and Statistical Approach

We reviewed all of the Internal Medicine resident-run code blue records for the years July of 2012 to June of 2013 and July of 2013 to June of 2014 at the Bethlehem campus, with our focus being whether or not debriefing was completed, location of code blue, length of code blue, and PGY year of the resident running the code. We excluded prehospital/ED codes as well as ICU/MICU/CCU codes. Our intervention occurred between the two years of review and included increased education about debriefing in the form of 1) intern orientation education, 2) pocket cards, 3) verbal presentation at monthly residency program meetings, and 4) simulator training. We conducted t-tests for percentages to determine differences in debriefing percentages between academic years.

Results

In the academic year from July of 2012 to June of 2013, post-code debriefing occurred only 34.62% of the time. Following our interventions, post-code debriefing occurred 75% of the time during the following academic year. Based on a t-test for percentages, the difference between the pre- and post-debriefing period percentages (34.6%, 9/26 versus 75%, 12/16) was statistically significant ($p = 0.01$).

Discussion and Conclusion

Debriefing continues to be an essential component of any team effort. By incorporating formal education, we successfully increased the rate of post-code debriefing occurrences in resident-run code blue events. Continued efforts going forward will benefit both patients and code team members, as debriefing allows for a productive, professional forum in which to continuously analyze and improve the code blue process.

POSTER PRESENTATION ABSTRACT

Failed Endometrial Ablation: Who Is at Risk?

*Angel Gonzalez Rios, MD; Melissa Chu Lam, MD; Cori Shollenberger, MS4;
Jessica Wagner, MS4; Jill Stoltzfus, PhD; James Anasti, MD*

Introduction/Background

About 20% of women who undergo endometrial ablation subsequently need a hysterectomy. Thus, the identification of factors that increase the risk of endometrial ablation failures would be valuable in counseling patients. Through limited chart reviews, a few factors have been identified. Our study sought to identify additional risk factors.

Methodology and Statistical Approach

A retrospective chart review was conducted on patients who underwent hysterectomy for failed endometrial ablation. In addition, a review of randomly selected cases of successful endometrial ablation for the same period was performed. Body mass index (BMI, calculated as $[\text{weight (kg)}/\text{height (m)}]^2$), post-endometrial ablation weight gain, gravity, parity, cesarean delivery, comorbidities, smoking, gynecologic surgery, hysteroscopy or dilation and curettage (D&C) at the time of endometrial ablation, uterine sound length, and preoperative endometrial biopsy result were compared in separate univariate analyses. To correct for multiple testing, all comparisons were considered significantly different if $p < .002$.

Results

During a 10-year period, endometrial ablation was performed in 785 patients, with 202 undergoing subsequent hysterectomy; 271 patients of the remaining 583 were used as a control group. All of the following represented statistically significant risk factors based on differences between the two patient groups: smoking, multiparity, history of cesarean delivery, previous gynecologic surgery, larger uterine sound length, and lack of hysteroscopy or D&C at the time of endometrial ablation. The following factors were not significantly different between groups: BMI, post-endometrial ablation weight gain, and preoperative endometrial biopsy pathology. Of note, 62% of patients had adenomyosis on uterine pathology.

Discussion and Conclusion

From our detailed chart review, we identified several previously unrecognized factors that increase the risk of endometrial ablation failure. Further research into these factors may help in the counseling of patients regarding treatment options for their abnormal uterine bleeding.

POSTER PRESENTATION ABSTRACT

Red Blood Cell Distribution Width Variation: a Marker for Preterm Labor?

*Angel Gonzalez Rios, MD; Melissa Chu Lam, MD; Matthew Zuber, MD;
Jessica Wagner, MS4; Jill Stoltzfus, PhD; James Anasti, MD*

Introduction/Background

The red blood cell distribution width is a measure of the variation of red blood cell volume. Recently, elevated levels have been associated with several disease processes, such as heart disease and septic shock outcomes. In some studies, this increase in red blood cell distribution width has been attributed to occult inflammation. In normal pregnancies, red blood cell distribution width increases during the last 4 weeks before delivery. We therefore hypothesized that, as a result of inflammation, preterm patients would have higher red blood cell distribution width compared to term women.

Methodology and Statistical Approach

In a retrospective case–control study, we compared 150 randomly selected patients who spontaneously delivered before 37 weeks of gestation with 150 patients who delivered at term during the last 10 years at our hospital. Red blood cell distribution width, hemoglobin, hematocrit, and white blood cell count were compared at the day of admission and day of delivery. We excluded individuals with known infection, inflammatory diseases, and hematologic disorders.

Results

Patient age was similar in each group (preterm = 25.65 years, term = 26.17 years). The average gestational age was 33.16 weeks in the preterm group and 39.16 weeks in term. Red blood cell distribution width did not differ between the groups (preterm 13.76, term 14.26). Subanalysis of preterm patients with premature preterm rupture of membranes or gestational age less than 35 weeks did not differ compared with term women.

Discussion and Conclusion

To our knowledge, this is the first study to look at red blood cell distribution width in preterm patients. Based on our study, red blood cell distribution width does not appear to be a significant marker for preterm delivery.

POSTER PRESENTATION ABSTRACT

Effect of Food Intake on Performance in Computerized Neuro-Cognitive Testing

Haidy Rivero, MD; Maheep Vikram, MD; Brian Gloyeske, MS; Jill Stoltzfus, PhD

Introduction/Background

In 2011, the CDC reported that, among children and adolescents, approximately 173 285 sports- and recreational-related traumatic brain injuries (including concussions) are treated across the United States annually. Data suggest that the rate of sports-related concussion is on the rise over the past decade. For optimal recovery, early identification, proper assessment, and active management of sports-related concussion are essential. Neurocognitive testing can provide objective information that is sensitive to the often subtle neurocognitive effects of concussion. Computerized neurocognitive testing is a growing practice that allows athletes to be evaluated quickly, but the lack of standardized administration procedures tests may adversely impact the validity and the interpretation of results. Recommendations for giving the test include an appropriate supervised environment (school or clinic), 8 hours of sleep for test takers, and a computer with a mouse for test administration. There is no recommendation regarding timing or content of food intake. The impact of dietary intake on cognition and arousal has been a topic of interest and research through the years. Some studies have shown that carbohydrate-rich and protein-poor meals can be sedating, whereas protein-rich meals may be arousing, improving reaction time but also increasing unfocused vigilance. In contrast, fat-rich meals can lead to a decline in alertness, especially where they differ from habitual fat intake. Therefore, we hypothesized that after a meal, athletes would exhibit inferior performance on a computerized neurocognitive test.

Methodology and Statistical Approach

This was a prospective cohort study involving 16 athletes recruited from East Stroudsburg University. Subjects completed two computerized cognitive tests (IMPACT) and a food intake questionnaire. The primary outcome was the change in performance on the IMPACT test measured at baseline and one hour after a meal intake. For exploratory purposes only, given the smaller than expected sample size, we conducted separate Wilcoxon signed rank tests for continuous outcomes to compare IMPACT percentile scores before and after meal consumption, with reporting of medians due to the mostly skewed distributions. In contrast to raw IMPACT scores, percentile scores most accurately reflect individual subject changes from baseline to post-meal performance. We report descriptive outcomes only for the remaining variables, including the self-reported total calories consumed. All subjects reported that they didn't consume any food or beverage prior to arriving at the test site. For our analyses, $p \leq .05$ denotes statistical significance, with no adjustment for multiple testing.

Results

Mean age was 23.4 ± 2 years (range = 21 – 27), with 10 females (62.5%) and 6 males (37.5%). Subjects reported sleeping a median of 7.5 hours the night before testing (range = 6 to 8.5 hours).

As revealed in the table below, a statistically significant improvement was noted on post-meal neurocognitive performance in the composite score areas of visual memory percentile ($p = 0.05$), visual motor speed percentile ($p = 0.002$), and reaction time percentile ($p = 0.01$). There was no statistically significant improvement for the verbal memory percentile ($p = 0.90$). Subjects' estimated food intake included milk and milk products (median calories = 280); vegetables (median calories = 150); fruits (median calories = 104); grains, breads, and cereals (median calories = 344); meats, beans, and nuts (median calories = 551); and beverages (median calories = 110).

ImPACT Variables	Baseline (median, range)	Post-Meal (median, range)	p-value
<i>Verbal Memory</i>	92.5 (75 – 100)	93 (83 – 98)	N/A
<i>Verbal Memory Percentile</i>	77 (15 – 99)	80.5 (43 – 92)	0.90
<i>Visual Memory</i>	76.5 (53 – 95)	84 (60 – 100)	N/A
<i>Visual Memory Percentile</i>	58 (9 – 97)	83.5 (22 – 100)	0.05
<i>Visual Motor Speed</i>	41.6 (30.3 – 52.2)	44.7 (33.9 – 52.4)	N/A
<i>Visual Motor Speed Percentile</i>	59.5 (5 – 99)	74.5 (19 – 99)	0.002
<i>Reaction Time</i>	.60 (.46 - .78)	.59 (.44 - .72)	N/A
<i>Reaction Time Percentile</i>	33.5 (2 – 96)	44 (5 – 99)	0.01
<i>Impulse Control</i>	4 (1 – 13)	3 (0 – 11)	N/A
<i>Total Symptom Score</i>	0 (0 – 4)	0 (0 – 1)	N/A
<i>Cognitive Efficiency Index</i>	.39 (.02 - .57)	.48 (.05 - .65)	N/A

Discussion and Conclusion

Our results showed that IMPACT test performance was better after food intake for three of the four percentile scores. However, our study had the following limitations that must be taken into account when interpreting the data: 1) potential Type II error due to small sample size and a potential recall bias on self-reported calorie intake; 2) inability to control for potential confounding variables such as age, gender and type of calories consumed (e.g., milk products versus fruits/vegetables) due to small overall sample size; and 3) small subgroup sizes within each food type prevented conclusive determination of the *actual* effect of consuming a meal on improved IMPACT scores in the areas of memory-visual, visual-motor-speed, and reaction time.

POSTER PRESENTATION ABSTRACT

Injuries Associated with Supracondylar Femur Fractures

David Roy, MD; Paul Morton, MD; Kirk Jeffers, MD; Patrick Brogle, MD

Introduction/Background

Multiple epidemiologic studies of supracondylar femur fractures have been performed, but none describe the incidence of both orthopedic and non-orthopedic associated injuries in the polytrauma patient. Multiple orthopedic injuries add significant complexity to surgical timing, fixation, implant choice, and mobility, and non-orthopedic injuries further compound this complexity. The purpose of this study was to determine the incidence of injuries and initial operative outcomes associated with supracondylar femur fractures.

Methodology and Statistical Approach

This was a retrospective review of SLUHN inpatient and outpatient records from 2006 to 2014. Subjects were evaluated regarding demographics, treatment characteristics, radiologic findings, and coexisting injuries. Exclusion criteria were as follows: fracture periprosthetic to a previous knee arthroplasty, non-operative treatment, open physis, and loss to follow-up. Outcomes were defined as the final available imaging for the subject or the final available imaging prior to further surgical intervention. Data are reported in frequencies and ranges.

Results

Of the 136 distal femur fractures found, 68 were excluded. Included subjects (n = 68) were 16 males and 52 females with average age at the time of injury of 68 years (range 17-102) and average BMI of 29 (range 15-48). Forty-four subjects sustained injuries by falling from standing (65%), 13 were in a motor vehicle collisions (20%), 2 fell from a height greater than standing (3%), 5 sustained injuries through other mechanisms (7%), and 3 were unknown (4%). Concurrent orthopedic injuries included 11 to the ipsilateral lower extremity (16%), 4 to the ipsilateral upper extremity (6%), 3 to the contralateral lower extremity (4%), 3 to the contralateral upper extremity (4%), 1 pelvis (1%), and 6 spine injuries (9%). Concurrent non-orthopedic injuries included 6 chest (9%), 2 head (3%), and 3 abdominal (4%). Fifteen surgeons performed the operative fixation of 68 distal femur fractures, with two-thirds of the surgeries split between two surgeons. Fifty-seven fractures were fixed with a condylar plate (84%), 10 were fixed with a retrograde nail (15%), and 1 was fixed with an antegrade nail (1%). Average follow-up time for initial outcome was 10 months (range 1-65); 29/68 fractures remained stable in anatomic alignment (43%), 31 remained stable in non-anatomic alignment (46%), and 8 collapsed into varying anatomical positions (12%). Of these 68 operatively fixed fractures, 14 showed arthritic changes that were not present on initial imaging (21%).

Discussion and Conclusion

Guidelines for assessment, planning, and treatment of patients with supracondylar femur fractures remain ill-defined with scarce supporting evidence. While better implant design has improved the success rate of fracture repair for certain outcome variables in recent decades, longer-term outcomes are uncertain. This study provides an epidemiological picture of the demographics, fracture types, associated injuries, and operative outcomes for supracondylar femur fractures in adult subjects, and therefore contributes to the baseline understanding of the demographics, associated injuries, and treatment characteristics of supracondylar femur fractures in adults.

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