



# DAY OF TRAUMA



6<sup>th</sup> Annual M. Gage Ochsner Resident Paper Competition



GEORGIA TRAUMA SYSTEM BIENNIAL MEETING  
AUGUST 15-16, 2019  
KING AND PRINCE BEACH & GOLF RESORT  
ST. SIMONS ISLAND, GA



# DAY OF TRAUMA



6<sup>th</sup> Annual M. Gage Ochsner Resident Paper Competition

## GEORGIA TRAUMA SYSTEM BIENNIAL MEETING



GEORGIA TRAUMA  
COMMISSION

ACS Chapter | Georgia Society of the ACS



AMERICAN COLLEGE OF SURGEONS  
Inspiring Quality: Highest Standards, Better Outcomes



GEORGIA  
QUALITY  
IMPROVEMENT  
PROGRAM

*Thank you for your dedication to the improvement of trauma care in Georgia!*

## MEETING SPACE LOCATIONS

THE KING AND PRINCE BEACH & GOLF RESORT  
201 ARNOLD ROAD  
ST. SIMONS ISLAND, GEORGIA 31522



## DRESS ATTIRE

Business Casual

## CME

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME). The American College of Surgeons is accredited by the ACCME to provide continuing medical education for physicians. The American College of Surgeons designates this live activity (Day of Trauma) for a maximum of **6.5 AMA PRA Category 1 credit(s)<sup>™</sup> for Trauma**. Physicians should only claim credit commensurate with the extent of their participation in the activity.

## DAY OF TRAUMA PRESENTERS



### **KEYNOTE: MICHAEL CHANG, MD, FACS**

Dr. Michael Chang currently serves as the System Chief Medical Officer and Associate Vice President for Medical Affairs at the University of South Alabama Health Care System. In this role he works with administrative and clinical leadership to optimize quality, patient safety, and patient satisfaction across the health care system.

He came to the USA Health System in September 2018 after over twenty years at the Wake Forest Baptist Health System in Winston Salem, North Carolina, where he served as a practicing trauma surgeon and medical director of the level 1 trauma center, System Chief Quality Officer, and Chief Medical Officer for the Wake Forest Baptist Medical Center. Dr. Chang also serves as the Chair of the Trauma Quality Improvement Program (TQIP) Committee for the American College of Surgeons - Committee on Trauma.

### **AMY KOESTNER, RN, MSN**

Amy Koestner is the Trauma Program Manager at Spectrum Health, a level 1 Trauma Center in Grand Rapids, Michigan. Amy has a 30-year nursing career with experience spanning the bedside in pediatric ICU, regional pediatric education, flight nursing, adult ICU bedside care, and the past 15 years in the role of trauma program manager. She has led multiple trauma centers through five ACS verification visits.

Amy has been active in the Society of Trauma Nurses (STN) for over 10 years, serving in a variety of leadership roles, including past president in 2008. Her involvement in STN has included participation as an original author/faculty member for the Optimal Trauma Center Organization & Management Course, one of the key authors of the Senior Lifestyle & Injury Prevention (SLIP) course, national & international faculty for the Advanced Trauma Care for Nurses (ATCN) course, and most recently as the appointed STN chair liaison to the Committee on Trauma. Amy remains active as faculty for ATCN, the Trauma Nurse Core Course (TNCC), the Emergency Nursing Pediatric Course (ENPC), and speaks on trauma topics on a state and national level. Amy has been involved in trauma system development in Michigan through her leadership role in the Michigan Trauma Coalition and Regional Trauma Advisory Committee in Southwest Michigan.

### **JUDY MIKHAIL, MBA, PHD, RN**

Judy N. Mikhail, PhD, MBA, RN has over 30 years of progressive trauma nursing experience, including roles as a Burn and Surgical ICU nurse, Critical Care Clinical Nurse Specialist, Trauma Program Manager and Trauma Administrator at Hurley Medical Center in Flint, MI. Dr. Mikhail is currently the Senior Program Manager for the Michigan Trauma Quality Improvement Program (MTQIP) a surgical quality improvement collaborative of 34 trauma centers in Michigan.

Dr. Mikhail is also the Editor-In-Chief for the Journal of Trauma Nursing. She received a BSN from the University of Michigan, MSN from the University of Texas Science Center Houston, MBA from Colorado State University and a PhD in Nursing from the Medical University of South Carolina. Her research interests include trauma disparities, and trauma performance improvement. Dr. Mikhail previously served as President of the Society of Trauma Nurses, President of the Michigan Trauma Coalition, and Chair of the Michigan – State Trauma Advisory Committee. She is a nationally recognized speaker in trauma care and serves as an instructor for the Optimal Trauma Center Organization & Management Course cosponsored by the ACS and STN.

## THE DAY BEFORE

**THURSDAY, AUGUST 15<sup>TH</sup>**

- |                        |   |
|------------------------|---|
| <b>8:30am - 1:45pm</b> | <b>GEORGIA TRAUMA COMMISSION MEETING</b><br><i>Delegal Room</i><br>Lunch Provided |
| <b>2:00pm - 4:00pm</b> | <b>GEORGIA COMMITTEE FOR TRAUMA EXCELLENCE MEETING</b><br><i>Delegal Room</i>     |
| <b>5:00pm - 7:00pm</b> | <b>DAY OF TRAUMA WELCOME RECEPTION</b><br><i>Retreat Room</i>                     |

## DAY OF TRAUMA AGENDA

**FRIDAY, AUGUST 16<sup>TH</sup>**

- |                        |   |
|------------------------|---|
| <b>7:00am - 7:50am</b> | <b>BREAKFAST   REGISTRATION OPEN</b><br><br><b>COT VICE-CHAIR MEETING</b><br><i>Lanier Room</i>   |
| <b>7:50am - 8:00am</b> | <b>WELCOME</b><br><i>Lori Mabry   Georgia Trauma Foundation</i><br><i>Kathy Browning   Georgia Society of the American College of Surgeons</i><br><i>Lanier Room</i>  |
| <b>8:00am - 9:30am</b> | <b>PANEL PRESENTATION: "CASE STUDIES IN PI - LEVELS OF REVIEW"</b><br><i>Michael Chang, MD, FACS   USA Health University Hospital, Mobile, AL</i><br><i>Amy Koestner, RN, MSN   Spectrum Health, Grand Rapids, MI</i><br><i>Judy Mikhail, MBA, PhD, RN   Michigan TQIP, Ann Arbor, MI</i><br><i>Lanier Room</i> |

*Come and learn the art to crafting good PI notes! This session will include in-depth real life case reviews from our own Georgia Trauma Centers to help participants understand how to capture the essence of PI review.*

- |                        |  |
|------------------------|--|
| <b>9:30am - 9:40am</b> | <b>REFRESHMENT BREAK   EXHIBITORS OPEN</b> |
|------------------------|--|



# DAY OF TRAUMA AGENDA

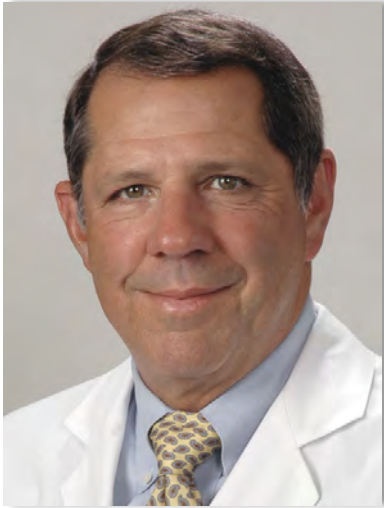
FRIDAY, AUGUST 16<sup>TH</sup>

- 9:40am - 10:05am**      **SYSTEM HIGHLIGHT:** “GEORGIA TRAUMA ECMO SUCCESS STORY”  
April Grant, MD & Elizabeth Atkins, MSN, RN, TCRN  
*Grady Memorial Hospital, Atlanta, GA*  
Charles Richart, MD, FACS & Jesse Gibson, MBA, BSN, RN, TCRN  
*Northeast Georgia Medical Center, Gainesville, GA*  
*Lanier Room*
- 10:05am - 11:20am**      **SPLIT SESSION:**
- GEORGIA QUALITY IMPROVEMENT PROGRAM (GQIP)  
COLLABORATIVE MEETING FOR LEVEL 1 & 2 TRAUMA CENTERS  
Christopher Dente MD, FACS and Kara Allard, MPH  
*Lanier Room*
  - SPECIAL SESSION FOR LEVEL 3 & 4 TRAUMA CENTERS  
Amy Koestner, RN, MSN | *Spectrum Health, Grand Rapids, MI*  
Judy Mikhail, MBA, PhD, RN | *Michigan TQIP, Ann Arbor, MI*  
*Solarium*
- 11:20am - 11:30am**      **BREAK | EXHIBITORS OPEN**
- 11:30am – 12:00pm**      **GQIP BREAKOUT SESSION:** TRAUMA CENTER LEVEL DISCUSSIONS  
Christopher Dente MD, FACS and Kara Allard, MPH  
*Lanier Room/Solarium*
- 12:00pm - 1:30pm**      **GRAB N’ GO NETWORKING LUNCH | INSIDE OR BY THE POOL**  
*Delegal Room*
- 1:30pm – 2:30pm**      **KEYNOTE ADDRESS:**  
“CASE REVIEW: A CORNERSTONE OF OPTIMAL SURGICAL CARE”  
Michael Chang, MD, FACS | *USA Health University Hospital, Mobile, AL*  
*Lanier Room*

*While high quality registry data forms an important cornerstone for a quality program, many nuances in the care of complex surgical patients are sometimes lost. Dr. Chang will discuss how meticulous detailed case review can enhance a systems quality program.*

- 2:30pm - 3:00pm**      **REFRESHMENT BREAK | EXHIBITORS OPEN**
- 3:00pm - 5:00pm**      **M. GAGE OCHSNER RESIDENT PAPER COMPETITION**  
*American College of Surgeons, Committee on Trauma – Georgia Chapter*  
*Lanier Room*
- TRAUMA ADMINISTRATORS MEETING**  
*Solarium*

## RESIDENT PAPER COMPETITION NAMED IN MEMORY OF



**MIMS GAGE OCHSNER, JR.** was born in New Orleans, Louisiana to his urologist father M. Gage Ochsner and mother Paddy Ochsner on May 10, 1953. He was named for the best friend and colleague of his grandfather Dr. Alton Ochsner, who was one of the founders of the Ochsner Clinic. Gage attended Southern Methodist University in Dallas, Texas and then was graduated from Tulane University School of Medicine in 1979. During his medical school years, he was awarded the United States Naval Reserve Health Professions Scholarship. He completed a surgical internship at the National Naval Medical Center in Bethesda, Md. He completed his residency in surgery at the Naval Regional Medical Center in San Diego, Ca. In 1985, Dr. Ochsner then became the Chief of General Surgery and Director of Intensive Care at the Naval Hospital at Subic Bay, Philippines. From 1988-1990, he completed a fellowship in Trauma Critical Care at the Washington Hospital Center under the tutelage of his longtime friend and colleague Dr. Howard Champion. Following his fellowship training, he

stayed on there to become an attending surgeon in trauma critical care and an Associate Professor of Surgery.

In 1994, Dr. Ochsner left the military and moved to Savannah, Georgia to become Chief of Trauma and Surgical Critical Care at Memorial Health University Hospital. He became a full Professor of Surgery and was then appointed as Academic Chairman of the Mercer University School of Medicine Department of Surgery in 2011.

Dr. Ochsner served on numerous surgical society boards of directors and played a leadership role in many national surgical organizations. He was the president of the Ambrose Pare Society, the president of the Western Trauma Association, the president of the Georgia Surgical Society, the vice president of The American Association for the Surgery of Trauma, the vice president of the Southeastern Surgical Congress, and the Secretary-Treasurer of the Georgia Surgical Society. M. Gage Ochsner, Jr. authored more than 50 peer reviewed scientific publications and contributed eleven book chapters in major texts on trauma surgery. He was the principal investigator on four grant-funded studies at Memorial Health and directed fifteen separate educational courses in Savannah.

During his tenure at Memorial University Medical Center, Dr. Ochsner grew the Trauma Service from 900 admissions per year to 2,700 admissions per year, developed a respected and admired surgical critical care service, developed an Orthopedic Trauma Service, and expanded the full time Trauma Faculty from 3 to 9 surgeons. He played a major role in the development of the statewide Georgia Trauma System.

Dr. Ochsner received many awards and accolades, including the Memorial Health Lifetime Achievement Award and the Georgia Medical Society Health Hero Award. A \$300,000 gift was donated in his name to start the M. Gage Ochsner, M.D. Institute for Injury Research & Prevention.

Always the professor, Gage was a commanding presence on rounds, in the operating room, or running a meeting. His patients appreciated his skill and bedside manner; the medical students adored him and always asked him to be part of their graduation ceremony. His residents hung on his every word, and their great fear was that they would disappoint his expectations.

Some men make a difference in this world and M. Gage Ochsner, Jr., M.D. was certainly one of them. M. Gage Ochsner Jr., M.D. had a major impact on Memorial University Medical Center, the trauma/critical care service, and the surgical residency training program as well as the lives of all those he touched. He will remain in our hearts and minds for many, many years to come.

# M. GAGE OCHSNER RESIDENT PAPER COMPETITION

## 1. **WHOLE BLOOD USE DURING MASSIVE TRANSFUSION IN CIVILIAN TRAUMA PATIENTS**

BENJAMIN HAZEN, MD

*Emory University School of Medicine at Grady Hospital*

### AUTHORS

Brett Tracy MD, Benjamin Hazen MD, Rondi Gelbard MD, Christopher J. Dente MD, Jonathan Nguyen DO

### INTRODUCTION

Using uncrossmatched cold whole blood (WB) in civilian trauma patients as part of massive transfusion (MT) practice is poorly studied. We sought to study the impact of WB versus standard component therapy only (CT) during massive transfusion (MT) on product consumption, complications, and mortality.

### METHODS

This study is a retrospective review of adult male patients from January 2019 through April 2019 whose initial trauma triage required the release of MT blood products as tracked by our hospital's blood bank. The use of WB or CT and the activation of MT was at the discretion of the attending trauma physician. Demographics, blood product requirements, laboratory data, complications, and lengths of stay (LOS) were manually abstracted from the chart. Survival analysis was performed using Kaplan-Meier plots, which were filtered and censored for the median hospital LOS of the cohort.

### RESULTS

Massive transfusion was activated for 58 male trauma patients of which 37.9% (n=22) received WB and 62.1% (n=36) received CT. On average, 4.1 ( $\pm 2.6$ ) units of whole blood were transfused in the WB cohort. There was no difference in demographics, vitals, mechanism or mean change in base excess, hemoglobin, hematocrit, INR, or platelet count between groups ( $p > .05$ ). The FFP:PRBC (1.3 vs 1.0,  $p = .38$ ) and platelet:PRBC (0.6 vs 0.9,  $p = .21$ ) were similar between groups. However, significantly more patients in the CT group compared to the WB group received FFP (88.9% vs 45.5%,  $p = .0003$ ) and RBC (97.2% vs 40.9%,  $p < .0001$ ). While the mortality rate (8.3% vs 0.0%,  $p = .1$ ), median hospital LOS (days: 11 vs 9,  $p = .4$ ), and home discharge rate (41.7% vs 40.9%,  $p = .97$ ) were similar between the CT and WB groups, there were significantly greater VTE events in the CT group (16.7% vs 0.0%,  $p = .02$ ). Also, there was a notable survival benefit seen in the WB group compared to the CT group at 9.5 days (53.9% vs 16.7%, log-rank test  $p = .02$ ).

### CONCLUSION

While the initial vitals, GCS, and ISS were equivalent between groups receiving MT, the WB patients received significantly less FFP and RBC and had lower rates of VTE. WB also appeared to offer a survival benefit at 9.5 days; however, prospective studies are needed to further explore the true benefit of WB in the civilian trauma population undergoing MT.



# M. GAGE OCHSNER RESIDENT PAPER COMPETITION

## 2. **WHAT A PAIN: MULTIMODAL PAIN THERAPY AND DECREASED OPIOID USE IN ADULT TRAUMA PATIENTS**

ANDREW DRAHOS, MD

*Mercer University School of Medicine at Navicent Health*

### AUTHORS

Andrew Drahos MD, Dennis Ashley MD

### BACKGROUND

There is an increasing opioid epidemic in the United States. Depending on the extent of their injuries, trauma patients may require numerous medications to help with their pain during their recovery. With the increased concern of over-prescription of opioids, physicians must seek alternative medications, but still maintain the goal of adequate pain therapy.

### OBJECTIVE

The purpose of this study is to review the use of opioid before and after instituting a multimodal pain therapy guideline at a Level 1 Trauma center.

### METHODS

We began to implement multimodal pain therapy as part of our standard practice in 2017. With IRB approval, we performed a retrospective review of medications prescribed to trauma patients admitted to our facility from 2016 through 2018. We compared the amount of morphine milligram equivalents (MME) and amount of multimodal pain medications our patients received before and after implementation of our standard practice.

### RESULTS

A total of 3,329 patients were admitted in 2016 and 3,550 were admitted in 2018 to the trauma service. After excluding patients younger than 15-years old, there were 3,013 and 3,249 patients for review in 2016 and 2018 respectively. We found a 17.7% decrease in opioids used between 2016 and 2018. The difference in opioid use was statistically significant ( $p < 0.05$ ) between the two years of comparison. Concurrently, there was a substantial increase in the use of all multimodal pain medications, especially in the use of NSAIDs, neuropathic pain medications, and local anesthesia.

### CONCLUSION

Pain management is a complex goal, and an integral part of patient's recovery, especially in trauma. Our research suggests that using multimodal pain therapy can contribute to a reduction in the need of opioids.

# M. GAGE OCHSNER RESIDENT PAPER COMPETITION

## 3. INITIAL HYPOALBUMINEMIA IN TRAUMA PATIENTS PREDICTS FAILURE TO RESCUE FOLLOWING INPATIENT CARDIAC ARREST

BRETT TRACY, MD

*Emory University School of Medicine at Grady Hospital*

### AUTHORS

Brett M Tracy MD, Jessica Keilson MD, Randi N Smith MD MPH, Jacob Wilson MD, Bernadette Frias RN, Christopher J Dente MD, Rondi Gelbard MD

### INTRODUCTION

Failure to rescue (FTR) is failure to prevent death following an adverse event or complication. In trauma, FTR is complex and poorly understood. We hypothesized that after initial survival, malnutrition as determined by low intake serum albumin levels predicts FTR in trauma patients who suffer in-hospital cardiac arrest.

### METHODS

We performed a retrospective analysis of all trauma patients (N=5,920) admitted to our institution who were captured by our TQIP database from 2017 through 2018, over 4 quarters. We selected only patients who suffered cardiac arrest requiring cardiopulmonary resuscitation and excluded those who expired in the ER, had a LOS <1 day, or had incomplete albumin data. Albumin data was obtained by manual chart review. Demographics and outcomes were also collected, including lengths of hospitalization and FTR (death) following cardiac arrest. Chi-square tests with Poisson rates were used to assess categorical data and multivariable logistic regression determined predictors of death.

### RESULTS

There were 238/5920 (4.0%) patients who sustained cardiac arrest following trauma; 76 were excluded due to expiration within one day of admission and 23 patients lacked albumin data. Of the remaining 139 patients, 72.7% (n=101/139) were FTR while 27.3% (n=38/139) survived. The majority of the entire cohort were male (n=109/139, 78.4%), sustained blunt trauma (n=97/139, 69.8%), and were severely injured (ISS: 30.6 ±14.0). Patients with FTR expired 5 days after admission (IQR 2-17 days). Patients who survived had significantly higher serum albumin levels on admission than the FTR group (3.7 g/dL vs 3.4 g/dL, p=.01). On linear regression, a higher serum albumin was significantly associated with lower rates of FTR ( $R^2=77.2\%$ ,  $p<.0001$ ). On multivariable logistic regression controlling for age, GCS, gender, ISS, and mechanism, only low serum albumin levels significantly predicted FTR (OR 0.46, 95% CI 0.24-0.91, p=.03).

### CONCLUSION

After initial survival, in-hospital cardiac arrest most often occurs 5 days after admission and the majority of patients expire. Initial hypoalbuminemia is significantly and independently associated with FTR in this patient population. Recognition and optimization of a trauma patient's nutritional status at admission is essential for mortality reduction.

## M. GAGE OCHSNER RESIDENT PAPER COMPETITION

### **4. LACK OF FORMYL PEPTIDE RECEPTOR 1 INCREASES MORTALITY IN LOW CECAL LIGATION AND PUNCTURE IN LATE SEPSIS**

PATRICIA MARTINEZ-QUINONES, MD

*Medical College of Georgia at Augusta University*

#### AUTHORS

Patricia Martinez-Quinones<sup>1,2</sup>, Jaine McKenzie<sup>1,2</sup>, Nicole Klee<sup>2</sup>, Olufunke Arishe<sup>2</sup>, Mike W Brands<sup>2</sup>, Camilla F Wenceslau<sup>3</sup>, R Clinton Webb<sup>2</sup>. <sup>1</sup>Department of Surgery, Medical College of Georgia at Augusta University, Augusta, GA; <sup>2</sup>Department of Physiology, Medical College of Georgia at Augusta University, Augusta, GA and <sup>3</sup>Department of Physiology and Pharmacology, University of Toledo, Toledo, OH.

#### BACKGROUND

Despite advances in critical care, sepsis remains a disease with high morbidity and mortality rates. The late phase of sepsis is characterized by an increased mortality rate. Due to the complex underlying pathophysiology, identification of targeted therapies remains elusive. The involvement of formyl peptide receptor 1 (FPR1) on the mortality, blood pressure control and vascular function is unknown. We set out to determine the effects of FPR-1 absence in late sepsis.

#### METHODS

Male C57BL/6 (WT) and FPR-1<sup>-/-</sup> 12-15-week-old mice underwent radio-telemetry implantation for blood pressure and heart rate monitoring. After 7-day recovery period, low cecal ligation and puncture (CLP) or sham (laparotomy alone) procedure was performed. Mice were followed for survival for 7 days. Vascular function and dose-concentration response to phenylephrine (PE) induced contraction was assessed via tension-wire myograph of mesenteric resistance arteries (MRA).

#### RESULTS

FPR1<sup>-/-</sup> CLP mice had decreased survival compared to FPR<sup>-/-</sup> SHAM, WT SHAM and WT CLP groups. At baseline FPR1<sup>-/-</sup> (n=5) had lower mean arterial blood pressure compared to WT (n=8) (106.8mmHg vs 116.3mmHg, p=0.0072), although no difference in blood pressure was observed between WT CLP and FPR1<sup>-/-</sup> CLP mice (p>0.05). No difference in heart rate among the treatment groups was observed. WT CLP MRA (logEC<sub>50</sub> -5.071) exhibited decreased sensitivity to PE-induced contraction compared to WT SHAM (logEC<sub>50</sub> -5.658, p=0.0137) and so did FPR1<sup>-/-</sup> CLP MRA (logEC<sub>50</sub> -5.263) compared to FPR<sup>-/-</sup> SHAM MRA (logEC<sub>50</sub> -5.724, p<0.0001).

#### CONCLUSION

Lack of formyl peptide receptor 1 in late sepsis leads to higher mortality in mice with low ligation CLP. FPR-1 deficiency was also associated with lower mean arterial blood pressure at baseline. No differences between WT CLP and FPR1<sup>-/-</sup> CLP were observed on vasoconstriction to phenylephrine. These results suggest FPR1 may play a role in the innate immune response against polymicrobial intraperitoneal sepsis and its deficiency may alter the inflammatory response in late sepsis.

**External Funding:** NIH PO1 HL134604 (MWB and RCW), K99GM11888 (CFW)

# M. GAGE OCHSNER RESIDENT PAPER COMPETITION

## **5. THE ROLE OF DIAGNOSTIC LAPAROSCOPY FOR TRAUMA AT A HIGH VOLUME LEVEL ONE CENTER**

DEEPIKA KOGANTI, MD

*Emory University School of Medicine at Grady Hospital*

### AUTHORS

Hazen B, Koganti D, Dente CJ, Gelbard RB

### BACKGROUND

The role of minimally invasive surgery in trauma has continued to evolve over the past 20 years. Diagnostic laparoscopy (DL) has become increasingly utilized for the diagnosis and management of both blunt and penetrating injuries.

### OBJECTIVE

While the safety and feasibility of laparoscopy has been established for penetrating thoracoabdominal trauma, it remains a controversial tool for other injury patterns due to the concern for complications and missed injuries. We sought to examine the role of laparoscopy for the initial management of traumatic injuries at our urban Level 1 trauma center.

### METHODS

All trauma patients who underwent diagnostic laparoscopy for blunt or penetrating trauma between 2009-2018 were retrospectively reviewed. Injuries, rate of conversion to open surgery, and outcomes were evaluated.

### RESULTS

A total of 324 patients were included in the cohort. The average age was 35 years old. Of these cases, 178 (55%) DLs were negative for injury, and most of these were associated with low energy penetrating trauma. After stratifying by organs injured and conversion to open exploration, there were 34 diaphragm injuries, 30 (81%) of which required open repair. The stomach, small bowel, and colon were injured 9, 34, and 43 times respectively, of which 8 (89%), 32 (94%), and 39 (91%) were converted to exploratory laparotomy. Twenty-two of 37 (59%) liver injuries and 16 of 17 (94%) splenic injuries necessitated conversion to open. 1 of 2 (50%) of kidney and 1 of 1 (100%) of bladder injuries were repaired through exploratory laparotomy. If more than one organ was injured, the conversion rate was 92% (23/25). There were no missed injuries in the entire cohort.

### CONCLUSION

Although this is a single institution retrospective study, the high volume of cases appears to show that DL is a clinically significant and reliable tool for detecting injury and avoiding potential negative laparotomies. However, when injuries were present, the high rate of conversion to open exploration suggests that its utility for therapeutic intervention warrants further study.

# M. GAGE OCHSNER RESIDENT PAPER COMPETITION

## 6. THE WITTMANN PATCH: CLOSURE, NOT COVERAGE FOR THE OPEN ABDOMEN

HANNAH NEMEC, MD

*Mercer University School of Medicine at Navicent Health*

### AUTHORS

H. Nemec MD, T. Harper, DM Vaughn MD, DB Christie MD

### INTRODUCTION

Damage control laparotomy (DCL) is a technique utilized in both trauma and acute care surgical (ACS) patients who have sustained life threatening, intra-abdominal surgical conditions. The expeditious delivery of the DCL is intended to decrease intra-operative and post-operative mortality, however, the resultant open abdomen (OA) is not without its consequences. The development of the complex ventral hernia with loss of domain with failure of primary closure of the abdomen are known outcomes associated with the OA and reasons that the technique of DCL has come under scrutiny in the recent literature. Multiple management strategies for the OA have been described, but none endorsed as a standard of care expectation for primary abdominal wall closure. The peer-reviewed literature is lacking in descriptive guidelines and primary fascial closure (PFC) technique recommendations. In our institution, we noticed a difference in outcomes in our DCL patient population when they were managed with the Wittmann patch (WP) compared to the Abthera (AB) Vac coverage devices. Because the WP is a closure tool and allows the fascia to be tightened over time, we theorized that this form of active wound closure is more effective than the more popular AB coverage device. We hypothesized that the WP contributed to an improved closure rate of the OA after DCL

### METHODS

We performed a retrospective review of patients with open abdomens managed with both the AB and WP at a tertiary referral, level one trauma center. CDM codes were used to capture both trauma and ACS patients at our institution from 2011-2019. Patients were divided into either AB alone or WP groups. Exclusion criteria included premature device removal or if a separate device was used for closure. Endpoints of investigation were rates of: primary fascial closure (PFC), delayed fascial closure (DFC), closure rates excluding pre-existing hernias, complications including hernias and dehiscence, and number of takebacks and days until primary closure. PFC was defined as closure in less than 7 days with native fascia alone. DFC was defined as 7 days or longer to closure with native fascia alone. PFC and DFC rates were further calculated excluding patient's with pre-existing hernias at the initial operation. Finally, patients who had an open abdomen managed for greater than 3 days were identified in both the AB and WP groups and closure rates were calculated for these patients separately.

### RESULTS

From 2011-2019, 187 patients were identified in the AB group and 38 patients were identified in the WP group. AB and WP trauma patients were identified, n=63 and n=20 respectively. AB and WP ACS patients recorded with n=130 and n=23 respectfully. Death prior to final closure occurred in 55 patients in AB group and 7 patients in WP group. PFC achieved was 81% (n=108) in AB and 90% (n=28) in WP groups. PFC excluding preexisting hernias was 87% in AB and 100% in WP groups. DFC excluding preexisting hernias was 44% (n=16) and 100% (N=14) in AB and WP groups respectively.



Average number of takebacks was 1.61 and 2.63 times for AB and WP groups respectively. Average number of days until closure was 4.00 in the AB group and 7.33 in the WP group. 0% of patients required mesh to close without a pre-existing hernia in the WP group compared to 4.51% in the AB group. 6.02% and 0% of patient developed postoperative hernias in AB and WP groups respectively. 0% compared to 2.26% of patients in WP and AB groups developed a dehiscence. Patients with open abdomens for greater than 4 days were noted to have an overall closure rate of 76.67% (n=30) for AB and 100% (n=21) for WP groups.

## CONCLUSION

Damage control laparotomy is a lifesaving technique in the critically ill trauma or ACS patient with intra-abdominal catastrophes. While survival may be improved, the resultant OA is associated with devastating complications that can be avoided by achieving primary abdominal wall closure. While not well reported in the peer-reviewed literature, the application of the WP is an active form of pursuing primary fascial closure when compared to the AB, a coverage device. Our inter-institution observational results have demonstrated less OA associated complications and superior PFC and DFC rates with the WP when compared to patients managed with AB in all categories describing closure over a care delivery continuum.

# M. GAGE OCHSNER RESIDENT PAPER COMPETITION

## 7. **EARLY STERNAL FRACTURE FIXATION MAY DECREASE CRITICAL CARE REQUIREMENTS FOR TRAUMA PATIENTS**

BRETT TRACY, MD

*Emory University School of Medicine at Grady Hospital*

### AUTHORS

Brett Tracy MD, Andrew Isaacson MD, Jonathan Nguyen DO

### INTRODUCTION

In trauma patients, there is minimal literature regarding sternal fracture fixation and no consensus exists on the ideal management of these injuries. We explored our institution's experience with sternal fixation and its impact on TQIP tracked outcomes.

### METHODS

We performed a retrospective review of our TQIP database for sternal fractures occurring from 2016-2018. Patients with fractures were identified by ICD-10 diagnosis codes (S22.20-S22.24) and fixation was identified by ICD-10 CM procedure codes. We excluded penetrating trauma and patients <18 and >65. Patients were divided into groups based on sternal fixation. Demographics, operative indications and timing, complications, as well as hospital, ventilator, and ICU length of stays (LOS) were tracked. Chi-squared tests with Poisson rates were used to determine differences between categories and t-tests were used to calculate differences among continuous variables.

### RESULTS

There were 163 patients with sternal fractures. They were most often male (n=108, 66.3%), white (n=83, 50.0%), severely injured (ISS 24.2  $\pm$  11.7), and aged 42  $\pm$  14.1 years. A total of 21 sternums were repaired (12.9%), typically on post-trauma day 2 (1-3.5) and as a result of pain (n=15, 71.5%). All sternum repairs used plating and were performed by trauma surgeons. Comparing fixed sternums to those not fixed, there was no difference in rates of acute kidney injury, adult respiratory distress syndrome, cardiac arrest, venous thromboembolic events, cerebrovascular events, ventilator associated pneumonia, unplanned intubations, unplanned returns to the operating room, or unplanned returns to the ICU. There was also no difference in discharge locations; however, no patients died in the sternal fixation group while 7% died (n=10) in the non-fixed group (p=.09). While hospital LOS (15 vs 11.5 days, p=.59) was similar between groups, ICU LOS was significantly shorter for fixed sternums (4 vs 6 days, p=.04).

### CONCLUSION

Our center expeditiously repairs fractured sternums and at a rate higher than previously reported. We noted no detrimental effects of fixation and found a significantly decreased ICU LOS. While larger, randomized trials are warranted, through TQIP we have identified an opportunity for major healthcare cost savings.

# M. GAGE OCHSNER RESIDENT PAPER COMPETITION

## 8. ASSESSING PREDICTIVE FACTORS FOR INTRA-ABDOMINAL INJURY TO MINIMIZE CT SCANS IN PEDIATRIC TRAUMA PATIENTS

ANDREW HARNER, MD

*Medical College of Georgia at Augusta University*

### AUTHORS

A Harner, J Mckenzie, A Mckenzie, R Hatley, W Pipkin, C Walters

### BACKGROUND

Evaluating pediatric trauma patients for intra-abdominal injury (IAI) can present a major challenge for trauma surgeons. Every evaluation may involve potential communication issues, patient distress, and difficult physical exam interpretation. Additionally, surgeons often have a high threshold to obtain computed tomography (CT) due to the detriments of radiation exposure at a young age.

### OBJECTIVE

Our aim is to better identify the history, exam findings, labs, and imaging which may indicate the presence of IAI and reduce unnecessary imaging (and thus radiation) that occurs in pediatric trauma patients.

### METHODS

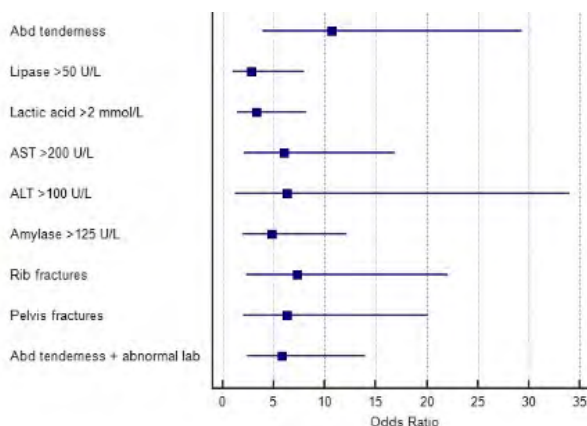
Using our institution's trauma database, a retrospective review identified 112 children who presented as a level 1 or level 2 blunt trauma and underwent CT abdomen/pelvis. 20 variables from history, physical exam, labs, and imaging were identified as potentially associated with IAI. Odds ratio, sensitivity, specificity, positive predictive value, and negative predictive value were calculated using contingency tables and chi-square tests. Significance set at  $\alpha = 0.05$ .

### RESULTS

Nine variables (Figure 1) were identified as significant positive predictors for IAI. ALT > 100 U/L was the most significant predictor from laboratory data (OR 6.0 [2.1-16.9]) while rib fractures (OR 11.1 [2.2-55.6]) and abdominal tenderness (OR 4.8 [1.9-12.2]) were the most significant predictors from imaging and physical exam, respectively.

### CONCLUSION

Using relevant labs and physical exam findings, a protocol for obtaining abdomen/pelvis CT scans may be an effective tool to reduce unnecessary radiation exposure in the pediatric trauma patient with questionable IAI.



## NOTES

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

# SAVE THE DATE

## GEORGIA TRAUMA SYMPOSIUM & SPRING MEETINGS

**MARCH 18-20, 2020**

CHATEAU ELAN WINERY & RESORT  
BRASELTON, GA

