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EASTERN ASSOCIATION FOR THE SURGERY OF TRAUMA

Advancing Science, Fostering Relationships, and Building Careers

29th ANNUAL SCIENTIFIC ASSEMBLY

JANUARY 12–16, 2016

JW Marriott San Antonio Hill Country Resort & Spa
San Antonio, Texas

Further Information & Questions

For post assembly-specific or CME/CE questions/requests, please contact:

Christine C. Eme, CAE, CMP, EAST Executive Director
Eastern Association for the Surgery of Trauma
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Chicago, IL 60611
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Fax: 312-202-5064
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www.east.org

For EAST business/membership questions/requests, please contact:

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Chicago, IL 60611
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Fax: 312-202-5064
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www.east.org

Digital Recording Policy

Portions of the EAST Annual Scientific Assembly are going to be electronically recorded by EAST. By participating in the discussions, EAST registrants agree that EAST may electronically copy or audio tape their attendance at and involvement in any program. No individual or entity may electronically record any portion of the EAST Annual Scientific Assembly without prior written consent.

Photos

Photographs of the EAST Annual Scientific Assembly and the events will be taken throughout the program. By attending the events, EAST registrants agree that their photograph may be used in EAST member communications and promotional materials.

CONTINUING MEDICAL EDUCATION CREDIT INFORMATION

Accreditation

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the American College of Surgeons and the Eastern Association for the Surgery of Trauma. The American College of Surgeons is accredited by the ACCME to provide continuing medical education for physicians.

AMA PRA Category 1 Credits™

The American College of Surgeons designates this live activity for a maximum of 28.25† *AMA PRA Category 1 Credits*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 24.50† credits meet the requirements for Self-Assessment.

† Due to concurrent sessions, this is the maximum amount of credit that one individual may claim.

CME Credit Breakdown	CME	Self-Assessment
29th Annual Scientific Sessions	19.00	15.25
Strategic Professional Development Workshop	6.00	6.00
Research Basics for the Acute Care Surgeon Workshop	5.00	5.00
Advanced Practitioners in Trauma Workshop	3.50	3.50
Basic Endovascular Skills for Trauma© Workshop	3.25	3.25

Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 4.25 hours were designated and may qualify as Pediatric Trauma.*

**The content of this activity may meet certain mandates of regulatory bodies. ACS has not and does not verify the content for such mandates with any regulatory body. Individual physicians are responsible for verifying the content satisfies such requirements.*

Sessions that may qualify for Pediatric Trauma	Total hours
January 13, 2016 Today's Topic #2 – Pediatric Conundrums	1.0
January 14, 2016, Scientific Session III-B, Papers 19, 20, 21, 22, 23	1.50
January 14, 2016 Today's Topic #7 – Management of Abdominal Solid Organ Injuries in Children	1.0
January 14, 2016 Scientific Papers That Should Have Changed Your Practice - Pediatric Papers	0.25
January 15, 2016 Scientific Session IV-A, Paper 27	0.50

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Inspiring Quality:
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AMERICAN COLLEGE OF SURGEONS
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Accredited with Commendation by the
Accreditation Council for Continuing Medical Education

Learning Objectives

This activity is designed for **surgeons, non-surgeon physicians, nurses, advanced practitioners, and other medical professionals involved in the care of the injured patients.** Upon completion of this course, participants will be able to:

1. Examine and implement injury prevention techniques which may lessen the burden of injury.

2. Articulate methods to optimize outcomes for the injured patient in austere/military environments.

3. Develop leadership skills to enhance his/her ability to work within a multidisciplinary team.

4. Foster a multidisciplinary approach to the care of the injured patient.

5. Interpret the presentation of scientific research in the treatment of the injured patient.

6. Evaluate and implement the organization and management of an institution's trauma system of care, including the appropriate use of advanced practitioners as part of the trauma team.

If you are a member of the American College of Surgeons, your completed CME information will be sent to "MY CME Portal Page" and will be updated with the credits within six (6) months of this activity. ACS ID #_____ - you will need this when completing the online evaluation.

Claiming CME and Self-Assessment Credit:

All registered participants must obtain CME and Self-Assessment Credit using the online system. All CME Evaluation forms must be completed within thirty (30) calendar days after the meeting (by February 15, 2016). To be eligible for Self-Assessment Credit you MUST take AND pass the Self-Assessment posttest(s) within ten (10) calendars days of the session (January 26, 2016). All Self-Assessment posttests must be taken and a passing score received by this date to receive credit.

An email with information for claiming your CME Credit for the 29th Annual Scientific Assembly will be sent to all meeting registrants (does not include Guests). **NOTE:** The email will be sent to the email address you provided with your meeting registration information. See the EAST website for details on how to retrieve your CME Certificate and how to complete the requirements for Self-Assessment.

DISCLOSURE INFORMATION
29TH EAST ANNUAL SCIENTIFIC ASSEMBLY
JANUARY 12-16, 2016
SAN ANTONIO, TEXAS

In accordance with the ACCME Accreditation Criteria, the American College of Surgeons, as the accredited provider of this activity, must ensure that anyone in a position to control the content of the educational activity has disclosed all relevant financial relationships with any commercial interest. Therefore, it is mandatory that both the program planning committee and speakers complete disclosure forms. Members of the program committee were required to disclose **all** financial relationships and speakers were required to disclose any financial relationship **as it pertains to the content of the presentations**. The ACCME defines a 'commercial interest' as "any entity producing, marketing, re-selling, or distributing health care goods or services consumed by, or used on, patients". It does not consider providers of clinical service directly to patients to be commercial interests. The ACCME considers "relevant" financial relationships as financial transactions (in any amount) that may create a conflict of interest and occur within the 12 months preceding the time that the individual is being asked to assume a role controlling content of the educational activity.

ACS is also required, through our joint providership partners, to manage any reported conflict and eliminate the potential for bias during the activity. All program committee members and speakers were contacted and the conflicts listed below have been managed to our satisfaction. However, if you perceive a bias during a session, please report the circumstances on the session evaluation form.

Please note we have advised the speakers that it is their responsibility to disclose at the start of their presentation if they will be describing the use of a device, product, or drug that is not FDA approved or the off-label use of an approved device, product, or drug or unapproved usage.

The requirement for disclosure is not intended to imply any impropriety of such relationships, but simply to identify such relationships through full disclosure and to allow the audience to form its own judgments regarding the presentation.

SPEAKERS/MODERATORS/ DISCUSSANTS	NOTHING TO DISCLOSE	DISCLOSURE Company, Role, Received
Mostafa Alhabboubi	X	
Lisa Allee	X	
Jonathan Alterie	X	
Darwin Ang	X	
Sandra Arabian	X	
Mamoona Arif Rahu	X	
Scott Armen	X	
Fadi Balla	X	
James Bardes	X	
Stephen Barnes	X	
Natasha Becker	X	
Andrew Beckett	X	
Bishwajit Bhattacharya	X	
Grant Bochicchio	X	

SPEAKERS/MODERATORS/ DISCUSSANTS	NOTHING TO DISCLOSE	DISCLOSURE Company, Role, Received
Jordan Bohnen	X	
Eric Bradburn	X	
Matthew Bradley	X	
Scott Brakenridge	X	
Megan Brenner		Pryor Medical Clinical Advisory Board Member, Stockholder
Brian Brewer	X	
Joshua Brown	X	
Brandon Bruns	X	
Michelle Buehner	X	
James Byrne	X	
Rachael Callcut	X	
Eric Campion	X	
Jeremy Cannon	X	
Alex Chang	X	
Edward Chao	X	
Tanya Charyk Stewart	X	
Paul Chestovich	X	
A. Britton Christmas	X	
Steve Chun	X	
David Ciesla	X	
Mark Cipolle	X	
Mitchell Cohen	X	
Jamie Coleman	X	
John Como	X	
Bryan Cotton	X	
Marie Crandall	X	
Michael Cripps	X	
Bruce Crookes	X	
Jessica Crystal	X	
Kimberly Davis	X	
Christopher Dente	X	
Jose Diaz	X	
Mark Diebel	X	
Michael Dingeldein	X	
Nicholas Drahush	X	
Nathan Droz	X	
Therese Duane	X	
Joseph DuBose	X	
Alexander Eastman	X	
Peter Ehrlich	X	

SPEAKERS/MODERATORS/ DISCUSSANTS	NOTHING TO DISCLOSE	DISCLOSURE Company, Role, Received
Amanda Elikofer	X	
Joel Elterman	X	
Toby Enniss	X	
Audrey Ertel	X	
Samir Fakhry	X	
Richard Falcone, Jr.	X	
Stephen Fann	X	
Edward Vincent Faustino		DSMB Member for an Anticoagulation Trial
Brittany Fenner	X	
Paula Ferrada	X	
Michael Fitzgerald	X	
Laura Fluke	X	
Lindley Folkerson	X	
Gerald Fortuna	X	
Shannon Foster	X	
Adam Fox	X	
Nicole Fox	X	
Jonathan Friedman	X	
Stephen Gale	X	
Luis Garcia	X	
Jacob Glaser	X	
Simon Glasgow	X	
Joseph Golob	X	
Kirby Gross	X	
Oscar Guillamondegui	X	
Weidun Alan Guo	X	
Elizabeth Habermann	X	
Meghan Halub	X	
Fadi Hamadani	X	
Greg Hambright	X	
Peter Hammer	X	

SPEAKERS/MODERATORS/ DISCUSSANTS	NOTHING TO DISCLOSE	DISCLOSURE Company, Role, Received
Elliott Haut		Primary investigator of a contract (CE-12-11-4489) with The Patient-Centered Outcomes Research Institute (PCORI) entitled "Preventing Venous Thromboembolism: Empowering Patients and Enabling Patient-Centered Care via Health Information Technology." Royalties from Lippincott, Williams, Wilkins for a book - "Avoiding Common ICU Errors." Paid consultant and speaker for the "Preventing Avoidable Venous Thromboembolism— Every Patient, Every Time" VHA IMPERATIV® Advantage Performance Improvement Collaborative. Paid consultant and speaker for the Illinois Surgical Quality Improvement Collaborative "ISQIC."
Joshua Hazelton		Smith & Nephew, Speaker, Honorarium
Jack He	X	
Amy Hildreth	X	
Vanessa Ho	X	
Erica Hodgman	X	
Melanie Hoehn	X	
Daniel Holena	X	
Ciara Huntington	X	
Nichole Ingalls	X	
Randeep Jawa	X	
David Jeffcoach	X	
Donald Jenkins	X	
Elliot Jessie	X	
Daryhl Johnson, II	X	
Bellal Joseph	X	
Haytham Kaafarani	X	
Elinore Kaufman	X	
Benjamin Keller	X	
Martin Keller	X	
Natasha Keric	X	
Uzer Khan	X	
Bijan Kheirabadi	X	
Brian Kim	X	

SPEAKERS/MODERATORS/ DISCUSSANTS	NOTHING TO DISCLOSE	DISCLOSURE Company, Role, Received
Jennifer Knight	X	
Amy Koestner	X	
Stanley Kurek, Jr.	X	
Matthew Kutcher	X	
Margaret Lauerman	X	
Christine Leeper	X	
William Leeper	X	
Jason Lees	X	
Robert Letton, Jr.	X	
Molly Lozada	X	
Patricia Maher-Harrison	X	
Amy Makley	X	
Mark Malangoni	X	
Matthew Martin	X	
Kazuhide Matsushima	X	
Adrian Maung	X	
Sean McCully	X	
Amy McDonald	X	
Sandra Medinilla	X	
Jonathan Meizoso		Naval Medical Research Center Advanced Development Program, Investigator, Grant Office of Naval Research, Investigator, Grant U.S. Army Medical Research & Materiel Command, Investigator, Grant
Caleb Mentzer	X	
Jonathan Messing	X	
Judy Mikhail	X	
Benjamin Miller	X	
Ernest Moore		Haemonetics, Research Support TEM, Research Support
David Morris	X	
Nathan Mowery	X	
Alan Murdock	X	
Sarah Murthi	X	
Khanjan Nagarsheth	X	
Mary Nally	X	
Nicholas Namias	X	
Mayur Narayan	X	
Julie Nash	X	
Avery Nathens		American College of Surgeons, TQIP Consultant, Speaker
Raminder Nirula	X	
John Oh	X	

SPEAKERS/MODERATORS/ DISCUSSANTS	NOTHING TO DISCLOSE	DISCLOSURE Company, Role, Received
Olubode Olufajo	X	
Tahereh Orouji Jokar	X	
Morgan Oskutis	X	
Tiffany Overton	X	
Andrea Pakula	X	
Urmil Pandya	X	
Pratik Parikh	X	
Myung Park	X	
Jose Pascual	X	
Jason Pasley	X	
Jigarkumar Patel	X	
Mayur Patel	X	
Kevin Pei	X	
Lindsey Peters Mossler	X	
Herb Phelan	X	
Joan Pirrung	X	
David Plurad	X	
Stephanie Polites	X	
Travis Polk	X	
Bradley Putty	X	
Rishi Rattan	X	
Barbara Reid	X	
Kyle Remick	X	
Joao Rezende-Neto	X	
Arturo Rios Diaz	X	
Bryce Robinson	X	
Carlos Rodriguez	X	
Frederick Rogers	X	
Samuel Ross	X	
Michael Rotondo	X	
Joseph Sakran	X	
Ali Salim	X	
Britt Sandler	X	
Heena Santry	X	
Babak Sarani		Haemonetics, Speaker, Honorarium
Kennith Sartorelli	X	
Stephanie Savage	X	
Paul Schenarts	X	
Martin Schreiber	X	
Douglas Schuerer	X	
Kevin Schuster	X	

SPEAKERS/MODERATORS/ DISCUSSANTS	NOTHING TO DISCLOSE	DISCLOSURE Company, Role, Received
Meike Schuster	X	
Jonathan Scott	X	
Mark Seamon	X	
Adil Shah	X	
Charles Shahan	X	
Upma Sharma	X	
Casey Shelley	X	
Sherry Sixta	X	
Jason Smith	X	
Reed Smith	X	
Kyle Sokol	X	
David Spain	X	
Nicole Stassen	X	
Deborah Stein	X	
Susan Steinemann	X	
Melvin Stone, Jr	X	
Christian Streck, Jr.	X	
Erik Streib	X	
Lance Stuke	X	
Madhu Subramanian	X	
Cynthia Talley	X	
Dennis Taylor	X	
Adam Vogel	X	
Michael Wandling	X	
Ann Marie Warren	X	
Melissa Warta	X	
Jeffrey Wild	X	
Brian Williams	X	
Alison Wilson	X	
Robert Winfield	X	
Daniel Yeh	X	
Jeffrey Young	X	
Tanya Zakrison	X	
Ben Zarzaur		Merck, Advisory Board, Consulting Fee
Frank Zhao	X	
Martin Zielinski	X	
Peter Zmijewski	X	
Cheryl Zogg	X	

PLANNING COMMITTEE	NOTHING TO DISCLOSE	DISCLOSURE Company, Role, Received
Scott Armen	X	
Andrew Bernard	X	
Christopher Dente	X	
Jose Diaz		Acute Innovations, Consultant, Honorarium KCI, Consultant, Honorarium Synthes, Consultant, Honorarium
Alexander Eastman	X	
Amanda Elikofer	X	
Richard Falcone, Jr.	X	
Joshua Hazelton		Smith & Nephew, Speaker, Honorarium
Diane Hochstuhl	X	
Amy Koestner	X	
Amber Kyle	X	
Rebecca Lofthouse	X	
Jonathan Messing	X	
Nathan Mowery	X	
Julie Nash	X	
Joan Pirrung	X	
Joseph Sakran	X	
Kevin Schuster	X	
Deborah Stein	X	
Melissa Thorson		TCAA 2014 Fellow, Finance & Operations Fellow, Stipend for fellowship work
Alison Wilson		Arsenal Medical, Consultant, Consulting Fee
Robert Winfield	X	
Ben Zarzaur		Merck, Advisory Board, Consulting Fee
Martin Zielinski		Xcede Technologies, Shareholder

Educational Grants

The Eastern Association for the Surgery of Trauma wishes to recognize and thank the following company for its ongoing support through educational grants:

In-kind donations, equipment loans, supplies, materials, etc. have been provided by the following:

Mentice

Mentice VIST-C Endovascular Simulators for the Basic Endovascular Skills for Trauma© Workshop on Saturday, January 16, 2016.

EAST INFORMATION

Welcome to San Antonio and the beautiful JW Marriott San Antonio Hill Country Resort and Spa. On behalf of the Board of Directors, our Executive Director Christine Eme, the EAST Administrative Staff, and the EAST Foundation Board of Trustees we wish you the best experience possible during the 29th Scientific Assembly of the Eastern Association for the Surgery of Trauma (EAST). It is always exciting when EAST goes West and I am sure you will love several of the program changes that are new this year.

Dr. Andrew Bernard, Chair of the Education Division and the Annual Scientific Assembly Section along with the members of the Annual Scientific Assembly Section have chosen a nice variety of cutting edge, unique abstracts for presentation. New this year are 20 Quick Shot abstracts that will be presented on Wednesday January 13, 2016. Realizing that we are all getting a little older and that sleep is invaluable, the early morning Sunrise Sessions have been revamped and are now called Today's Topics. These will be presented during lunch hours on Wednesday and Thursday and Friday morning will return to the earlier start time of 7:00 am. The EAST Community Outreach program, led by the EAST Injury Control and Violence Prevention Section chaired by Dr. Alexander Eastman, is now in its fifth year. At the conclusion of the 2016 program nearly 2,000 high school aged students will have been educated on the dangers of distracted and impaired driving since the program's beginning in 2012. Dr. Deborah Stein, Professional Development Division Chair, and Dr. Cynthia Talley, Chair of the Career Development Section, have done an outstanding job setting the career development workshops. I am so excited that we have added to our career development offerings a Fellows Workshop, focusing on variable resources for young surgeons transitioning into practice for the first time. This is something that I am sure all of us wanted when we were finishing our training.

Once again the EAST Foundation is sponsoring the Raymond H. Alexander, MD Resident Paper Competition and the Cox-Templeton Injury Prevention Paper Competition. Our Oriens Award Keynote will be delivered by my good friend, Past President Donald H. Jenkins. The always invigorating Scott B. Frame, MD Memorial Lecture will be presented by Dr. Mark A. Malangoni, Associate Executive Director of the American Board of Surgery. Dr. Malangoni will present "The Makings of a Trauma Surgeon" which will certainly be enlightening for trauma surgeons both young and old. We once again welcome the Pediatric Trauma Society and the Society of Trauma Nurses to our Assembly. Their continued collaboration with EAST has strengthened our scientific program and organization. Our Annual Scientific Assembly Section has worked diligently as well as the entire EAST Board of Directors, Divisions, and Sections to make this year's meeting the distinctive balance of education and networking for which EAST and the Annual Scientific Assembly are so well known.

What makes our organization so unique is that it's not all about the science. We invite you to attend the Opening Reception and Family Barbecue celebrations to enjoy great food and catch up with old friends as well as make some new ones. Once again the EAST Foundation is sponsoring the exciting and always entertaining Dodgeball Tournament (10 years of dodging, ducking and diving) preceding the Family Barbecue. Please make time to visit with our vendors as well and stop by the EAST Foundation booth to support our organization with a donation.

Finally, I want to thank all of you for the opportunity to serve as your President. It has been an incredible honor to lead this vibrant organization. EAST's Mission and Vision is shining brighter than ever because of the dedication, talent and enthusiasm of our members. Welcome to San Antonio and enjoy the meeting!

Stanley J. Kurek, Jr., DO, FACS
President, Eastern Association for the Surgery of Trauma

CODE OF CONDUCT FOR EAST MEETINGS

1. Introduction. The Eastern Association for the Surgery of Trauma ("EAST") is a nonprofit corporation, organized for charitable, educational, and scientific purposes. In particular, EAST: (i) fosters advances in the study and practice of the surgery of trauma; (ii) provides a forum for the exchange of knowledge pertaining to injury control, research, practice, and training in prevention, care, and rehabilitation of injury; and (iii) advances research, education, and training regarding the prevention, correction, and treatment of injuries ("Exempt Purpose"). In furtherance of its Exempt Purpose, EAST conducts and/or sponsors educational meetings including, without limitation, Annual Scientific Assemblies and periodic internal and external meetings and programs (collectively "Meeting(s)").

EAST seeks participation in its Meetings by individuals with varied and diverse backgrounds. EAST is committed to providing a friendly, safe and welcoming environment for all Meeting attendees, regardless of gender, sexual orientation, ability, ethnicity, socioeconomic status, religion (or lack thereof), and other individual characteristics. This Code of Conduct ("Code") outlines EAST's expectations of its Meeting attendees (including EAST members, EAST Board members, sponsors, invited guests, and any other person attending a Meeting), as well as the consequences for Unacceptable Behavior (defined below). We expect all Meeting attendees will abide by this Code at all Meetings, and in connection with activities outside of Meetings when such behavior has the potential to adversely affect the safety and/or wellbeing of Meeting attendees.

2. Expected Behavior. EAST expects its Meeting attendees will:

- Exercise consideration and respect in their speech and actions.
- Attempt collaboration before conflict.
- Refrain from demeaning, discriminatory, or harassing behavior and speech.
- Be mindful of their surroundings and fellow attendees.
- Be respectful to all patrons at Meeting venues.

3. Unacceptable Behavior. "Unacceptable Behavior" EAST will not tolerate includes, without limitation:

- Violence, threats of violence, or violent language.
- Disruptive, intrusive, insulting, antagonistic, or any other malicious conduct.
- Sexism, racism, homophobia, transphobia, or other discriminatory conduct.
- Inappropriate photography or recording.
- Inappropriate physical contact.
- Unwelcomed sexual attention and/or advances; including, using sexualized language.
- Intoxication, contributing to inappropriate behavior.
- Deliberate intimidation, stalking or following (online or in person).
- Sustained disruption during Meeting events, including talks and presentations.
- Advocating for, or encouraging, any of the above behavior.
- Any other conduct deemed inappropriate and/or that may jeopardize the success of a Meeting, EAST's reputation and goodwill, or the positive experience of any other Meeting attendee.

4. Consequences of Unacceptable Behavior. Unacceptable Behavior by Meeting attendees will not be tolerated. The determination of whether conduct constitutes Unacceptable Behavior, and the consequences imposed by EAST for the same, rest solely within EAST's discretion, and said determinations are final and not subject to appeal. Anyone asked to stop Unacceptable Behavior is expected to comply immediately. If a Meeting attendee engages in Unacceptable Behavior and/or does not comply with this Code, EAST may take any action deemed appropriate, up to and including a temporary ban or permanent expulsion from a Meeting without warning (and without refund, in the case of a paid event).

5. Reporting Guidelines. If you are subject to, or witness, Unacceptable Behavior, or have any other concerns, please notify EAST as soon as possible by contacting EAST's Executive Director or EAST's Executive Committee. If the subject Unacceptable Behavior involves the Executive Director, please notify EAST's current President. Additionally, Meeting organizers are available to help Meeting attendees engage local law enforcement, or to, otherwise, help those experiencing Unacceptable Behavior feel safe. During Meetings, organizers are available to provide escorts as desired to the Meeting attendee(s) experiencing distress.

Any questions or comments regarding this Code should be directed to EAST's Executive Director.

Adopted: April 30, 2015

2015 Board of Directors

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Deborah M. Stein, MD, MPH, FACS, Director

Representative to the Board of Governors of the American College of Surgeons

Joseph P. Minei, MD, FACS

Eastern Association for the Surgery of Trauma
Advancing Science, Fostering Relationships, and Building Careers

2015 Divisions and Sections

Division of Education
Andrew Bernard, MD, FACS, Division Chair
Annual Scientific Assembly Section – Andrew Bernard, MD, FACS, Section Chair
Online Education Section – Matthew Martin, MD, FACS, Section Chair

Division of Member Services
Oscar D. Guillamondegui, MD, MPH, FACS, Division Chair
Member Recruitment and Retention Section – Oscar D. Guillamondegui, MD, MPH, FACS, Section Chair

Division of Patient Care and Resources
Babak Sarani, MD, FACS, Division Chair
Guidelines Section – Bryce R.H. Robinson, MD, MS, FACS, Section Chair
Injury Control and Violence Prevention Section – Alexander L. Eastman, MD, MPH, FACS, Section Chair
Technology and Information Management Section – Babak Sarani, MD, FACS, Section Chair

Division of Professional Development
Deborah M. Stein, MD, MPH, FACS, Division Chair
Advanced Practitioners Section – A. Britton Christmas, MD, FACS, Section Chair
Career Development Section – Cynthia Talley, MD, FACS, Section Chair
Emergency General Surgery Section – Martin D. Zielinski, MD, FACS, Section Chair
Mentoring Section – Mayur B. Patel, MD, MPH, FACS, Section Chair
Military Section – Carlos J. Rodriguez, DO, MBA, FACS, Section Chair
Seniors Section – Samir M. Fakhry, MD, FACS, Section Chair

Division of Publications
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Manuscript and Literature Review Section – Kevin M. Schuster, MD, MPH, Section Chair

Division of Research
Joseph J. DuBose, MD, FACS, Division Chair
Multicenter Trials Section – Jose Pascual Lopez, MD, PhD, FACS, Section Co-Chair
Multicenter Trials Section – Ben L. Zarzaur, MD, MPH, FACS, Section Co-Chair
Research and Scholarship Section – Tanya L. Zakrison, MD, MPH, FACS, Section Chair

Visit "About EAST" on the EAST website, www.east.org,
for listings of EAST Sections and Section Volunteers.

PAST PRESIDENTS

1987-88	Kimball I. Maull	*Dispelling Fatalism in a Cause-and-Effect World*
1989	Burton H. Harris	*Searching for Values in Changing Times*
1990	Lenworth M. Jacobs, Jr.	*Forces Shaping Trauma Care*
1991	Howard R. Champion	*Reflections On and Directions for Trauma Care*
1992	C. William Schwab	*Violence: America's Uncivil War*
1993	Michael Rhodes	*Practice Management Guidelines for Trauma Care*
1994	Carl Boyd	*On Timeless Principles in Changing Times*
1995	James M. Hassett	*Do It Right, Do the Right Thing*
1996	William F. Fallon Jr.	*Surgical Lessons Learned on the Battlefield*
1997	John A. Morris Jr.	*The Evolving Role of the Scientific Society in the New Millennium*
1998	Timothy C. Fabian	*Evidence-Based Medicine in Trauma Care – Whither Thou Goest?*
1999	David B. Reath	*Why Am I Here?*
2000	Paul R. G. Cunningham	*Leadership, Professional Heroism, & the Eastern Association for the Surgery of Trauma*
2001	Eric R. Frykberg	*Disasters and Mass Casualties – How Can We Cope?*
2002	Blaine L. Enderson	*Can Trauma Surgeons Survive Health Care Business?*
2003	J. Wayne Meredith	*Trauma Surgery: Current Status and Future Directions*
2004	Philip S. Barie	*Leading and Managing in Unmanageable Times*
2005	Michael F. Rotondo	*The Rural Trauma Imperative: A Silent Killer in America's Heartland*
2006	Michael Pasquale	*Outcomes for Trauma: Is There an End (Result) in Sight?*
2007	Kimberly K. Nagy	*Traditions, Innovations, and Legacies*
2008	Ernest FJ Block	*Think Different*
2009	Patrick M. Reilly	*Trauma Fellowship*
2010	Donald H. Jenkins	*Union of Forces*
2011	Erik S. Barquist	*It Matters: The Case for Advocacy*
2012	Jeffrey P. Salomone	*The One Who Applies the First Dressing*
2013	Scott G. Sagraves	*Maintaining Relevance in a Revolving Trauma World*
2014	Kimberly A. Davis	*Look Both Ways*

FOUNDING MEMBERS

Howard R. Champion
Burton H. Harris
Lenworth M. Jacobs, Jr.
Kimball I. Maull

PAST MEMBERS OF THE BOARD OF DIRECTORS

Founding Board
Raymond Alexander
Andrew Burgess
Howard R. Champion
Thomas Gennarelli
Burton H. Harris
Lenworth M. Jacobs, Jr.
Kimball I. Maull
Norman E. McSwain
Michael Rhodes
C. William Schwab

1988

Kimball I. Maull	President
Burton H. Harris	President Elect
Howard R. Champion	Secretary/Treasurer
Lenworth M. Jacobs, Jr.	Recorder/Program Chair
Ray Alexander	Local Arrangements
Carl Boyd	Director at Large
Andrew Burgess	Director at Large
Thomas Gennarelli	Director at Large
David Kreis	Director at Large
Michael Rhodes	Director at Large
C. William Schwab	Director at Large

1989

Burton H. Harris	President
Lenworth M. Jacobs, Jr.	President Elect
Kimball I. Maull	Past President
Michael Rhodes	Secretary/Treasurer
C. William Schwab	Recorder/Program Chair
Carl Boyd	Director at Large
Lawrence Bone	Director at Large
Robert Carraway	Director at Large
Alasdair Conn	Director at Large
Timothy C. Fabian	Director at Large
William F. Fallon, Jr.	Director at Large
David Kreis	Director at Large

1990

Lenworth M. Jacobs, Jr.	President
Howard R. Champion	President Elect
Burton H. Harris	Past President
Michael Rhodes	Secretary/Treasurer
C. William Schwab	Recorder/Program Chair
Lawrence Bone	Director at Large
L. D. Britt	Director at Large
Robert Carraway	Director at Large
Alasdair Conn	Director at Large
Daniel Diamond	Director at Large
Timothy C. Fabian	Director at Large
William F. Fallon, Jr.	Director at Large
James Hassett	Director at Large
Michael Hawkins	Director at Large
John A. Morris, Jr.	Director at Large

1991

Howard R. Champion	President
C. William Schwab	President Elect
Lenworth M. Jacobs, Jr.	Past President
Michael Rhodes	Secretary/Treasurer
Carl Boyd	Recorder/Program Chair
John Barrett	Director at Large
Susan Briggs	Director at Large
L. D. Britt	Director at Large
Daniel Diamond	Director at Large
Richard Gamelli	Director at Large
Gerardo Gomez	Director at Large
James Hassett	Director at Large
Michael Hawkins	Director at Large
John A. Morris, Jr.	Director at Large
David Reath	Director at Large

1992

C. William Schwab	President
Michael Rhodes	President Elect
Howard R. Champion	Past President
William F. Fallon, Jr.	Secretary/Treasurer
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John Barrett	Director at Large
Christopher Born	Director at Large
Susan Briggs	Director at Large
Sylvia Campbell	Director at Large
Paul Cunningham	Director at Large
Richard Gamelli	Director at Large
Gerardo Gomez	Director at Large
David Reath	Director at Large
Thomas Scalea	Director at Large

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Sylvia Campbell	Director at Large
Thomas Cogbill	Director at Large
Paul Cunningham	Director at Large
James Hurst	Director at Large
M. Gage Ochsner, Jr.	Director at Large
Thomas Scalea	Director at Large
Steven R. Shackford	Director at Large

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Blaine Enderson	Director at Large
Sheryl G. A. Gabram	Director at Large
James Hurst	Director at Large
Rao Ivatury	Director at Large
J. Wayne Meredith	Director at Large
M. Gage Ochsner, Jr.	Director at Large
Grace Rozycki	Director at Large
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C. Gene Cayten	Director at Large
Brad Cushing	Director at Large
Blaine Enderson	Director at Large
Eric Frykberg	Director at Large
Sheryl G. A. Gabram	Director at Large
Rao Ivatury	Director at Large
J. Wayne Meredith	Director at Large
Galen Poole	Director at Large
Michael F. Rotondo	Director at Large
Grace Rozycki	Director at Large

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C. Gene Cayten	Director at Large
Blaine Enderson	Director at Large
Eric Frykberg	Director at Large
Sheryl G. A. Gabram	Director at Large
Rao Ivatury	Director at Large
Michael Pasquale	Director at Large
Galen Poole	Director at Large
Michael F. Rotondo	Director at Large
Grace Rozycki	Director at Large

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C. Gene Cayten	Director at Large
Martin Croce	Director at Large
Eric Frykberg	Director at Large
Orlando Kirton	Director at Large
Mary McCarthy	Director at Large
Michael McGonigal	Director at Large
J. Wayne Meredith	Director at Large
Michael Pasquale	Director at Large
Andrew Peitzman	Director at Large
Michael F. Rotondo	Director at Large

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Paul Cunningham	President Elect
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Jack Bergstein	Director at Large
Martin Croce	Director at Large
Orlando Kirton	Director at Large
Mary McCarthy	Director at Large
Michael McGonigal	Director at Large
Kimberly Nagy	Director at Large
Michael Pasquale	Director at Large
Andrew Peitzman	Director at Large

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Ernest FJ Block	Director at Large
Collin Brathwaite	Director at Large
Martin Croce	Director at Large
Orlando Kirton	Director at Large
Mary McCarthy	Director at Large
Michael McGonigal	Director at Large
Kimberly Nagy	Director at Large
Andrew Peitzman	Director at Large
Patrick Reilly	Director at Large
L. R. "Tres" Scherer, III	Director at Large

2001

Eric Frykberg	President
Blaine Enderson	President Elect
Paul Cunningham	Past President
Michael Pasquale	Secretary/Treasurer
Michael F. Rotondo	Recorder/Program Chair
Jack Bergstein	Director at Large
Ernest FJ Block	Director at Large
Collin Brathwaite	Director at Large
Samir Fakhry	Director at Large
Heidi Frankel	Director at Large
Fred Luchette	Director at Large
Kimberly Nagy	Director at Large
Lena Napolitano	Director at Large
Patrick Reilly	Director at Large
L. R. "Tres" Scherer, III	Director at Large
Gregory Timberlake	Director at Large

2002

Blaine Enderson	President
J. Wayne Meredith	President Elect
Eric Frykberg	Past President
Michael Pasquale	Secretary/Treasurer
Kimberly Nagy	Recorder/Program Chair
Ernest FJ Block	Director at Large
Collin Brathwaite	Director at Large
Michael Chang	Director at Large
Samir Fakhry	Director at Large
Heidi Frankel	Director at Large
Fred Luchette	Director at Large
Lena Napolitano	Director at Large
Patrick Reilly	Director at Large
L. R. "Tres" Scherer, III	Director at Large
Amy Sisley	Director at Large
Gregory Timberlake	Director at Large

2003

J. Wayne Meredith	President
Philip S. Barie	President Elect
Blaine Enderson	Past President
Michael Pasquale	Secretary/Treasurer
Kimberly Nagy	Recorder/Program Chair
Erik Barquist	Director at Large
Michael Chang	Director at Large
Samir Fakhry	Director at Large
Heidi Frankel	Director at Large
Mark Healey	Director at Large
Fred Luchette	Director at Large
Michael Nance	Director at Large
Lena Napolitano	Director at Large
Amy Sisley	Director at Large
Gregory Timberlake	Director at Large
Jeffery Young	Director at Large

2004

Philip S. Barie	President
Michael F. Rotondo	President Elect
J. Wayne Meredith	Past President
Ernest FJ Block	Secretary/Treasurer
Kimberly Nagy	Recorder/Program Chair
Erik Barquist	Director at Large
Michael Chang	Director at Large
Brian Daley	Director at Large
Thomas Esposito	Director at Large
Jeffrey Hammond	Director at Large
Mark Healey	Director at Large
Fred Luchette	Director at Large
Michael Nance	Director at Large
Jeffrey Salomone	Director at Large
Amy Sisley	Director at Large
Jeffery Young	Director at Large

2005

Michael F. Rotondo	President
Michael Pasquale	President Elect
Philip S. Barie	Past President
Ernest FJ Block	Secretary/Treasurer
Patrick Reilly	Recorder/Program Chair
Erik Barquist	Director at Large
Brian Daley	Director at Large
Thomas Esposito	Director at Large
Henri Ford	Director at Large
Jeffrey Hammond	Director at Large
Michael Nance	Director at Large
Scott Sagraves	Director at Large
Jeffrey Salomone	Director at Large
Glen Tinkoff	Director at Large
Jeffery Young	Director at Large

2006

Michael Pasquale	President
Kimberly Nagy	President-Elect
Michael F. Rotondo	Past President
Ernest FJ Block	Secretary/Treasurer
Patrick Reilly	Recorder/Program Chair
Philip S. Barie	Director at Large
Brian Daley	Director at Large
Henri Ford	Director at Large
Jeffrey Hammond	Director at Large
Stanley Kurek, Jr.	Director at Large
Joseph Minei	Director at Large
Jeffrey Salomone	Director at Large
Paul Taheri	Director at Large
Glen Tinkoff	Director at Large

2007

Kimberly Nagy	President
Ernest FJ Block	President-Elect
Michael Pasquale	Past President
Erik Barquist	Secretary/Treasurer
Patrick Reilly	Recorder/Program Chair
William Charash	Director at Large
Kimberly Davis	Director at Large
Henri Ford	Director at Large
Mark Gestring	Director at Large
Stanley Kurek, Jr.	Director at Large
Lawrence Lottenberg	Director at Large
Joseph Minei	Director at Large
Glen Tinkoff	Director at Large
Paul Taheri	Director at Large

2008

Ernest FJ Block	President
Patrick Reilly	President-Elect
Kimberly Nagy	Past President
Erik Barquist	Secretary/Treasurer
Jeffrey Salomone	Recorder/Program Chair
Robert Barraco	Director at Large
Faran Bokhari	Director at Large
William Charash	Director at Large
Kimberly Davis	Director at Large
Mark Gestring	Director at Large
Stanley Kurek, Jr.	Director at Large
Lawrence Lottenberg	Director at Large
Joseph Minei	Director at Large
Scott Sagraves	Director at Large
Paul Taheri	Director at Large

2009

Patrick Reilly	President
Donald Jenkins	President-Elect
Ernest FJ Block	Past President
Erik Barquist	Secretary/Treasurer
Jeffrey Salomone	Recorder/Program Chair
Robert Barraco	Director at Large
Andrew Bernard	Director at Large
Faran Bokhari	Director at Large
William Charash	Director at Large
William Chiu	Director at Large
Kimberly Davis	Director at Large
Mark Gestring	Director at Large
Andrew Kerwin	Director at Large
Lawrence Lottenberg	Director at Large
Scott Sagraves	Director at Large

2010

Donald Jenkins	President
Erik Barquist	President-Elect
Patrick Reilly	Past President
Kimberly Davis	Secretary/Treasurer
Jeffrey Salomone	Recorder/Program Chair
Robert Barraco	Director at Large
Andrew Bernard	Director at Large
Faran Bokhari	Director at Large
William Chiu	Director at Large
Bruce Crookes	Director at Large
Andrew Kerwin	Director at Large
Herb Phelan	Director at Large
Tarek Razek	Director at Large
Scott Sagraves	Director at Large
Carl Valenziano	Director at Large

2011

Erik Barquist	President
Jeffrey Salomone	President-Elect
Donald Jenkins	Past President
Kimberly Davis	Secretary/Treasurer
Stanley Kurek, Jr.	Recorder/Program Chair
Andrew Bernard	Director at Large
William Chiu	Director at Large
Bruce Crookes	Director at Large
Therese Duane	Director at Large
Juan Duchesne	Director at Large
Andrew Kerwin	Director at Large
Herb Phelan	Director at Large
Tarek Razek	Director at Large
Shahid Shafi	Director at Large
Carl Valenziano	Director at Large

2012

Jeffrey Salomone	President
Scott Sagraves	President-Elect
Erik Barquist	Past President
Kimberly Davis	Secretary/Treasurer
Stanley Kurek, Jr.	Recorder/Program Chair
A. Britton Christmas	Director at Large
Bruce Crookes	Director at Large
Therese Duane	Director at Large
Juan Duchesne	Director at Large
Elliott Haut	Director at Large
Herb Phelan	Director at Large
Tarek Razek	Director at Large
Shahid Shafi	Director at Large
Nicole Stassen	Director at Large
Carl Valenziano	Director at Large

2013

Scott Sagraves	President
Kimberly Davis	President-Elect
Jeffrey Salomone	Past President
Bruce Crookes	Secretary/Treasurer
Stanley Kurek, Jr.	Recorder/Program Chair
A. Britton Christmas	Director at Large
Therese Duane	Director at Large
Joseph DuBose	Director at Large
Juan Duchesne	Director at Large
Samir Fakhry	Director at Large
Oscar Guillamondegui	Director at Large
Elliott Haut	Director at Large
Shahid Shafi	Director at Large
Nicole Stassen	Director at Large

2014

Kimberly Davis	President
Stanley Kurek, Jr.	President-Elect
Scott Sagraves	Past President
Bruce Crookes	Secretary/Treasurer
Andrew Bernard	Recorder/Program Chair
A. Britton Christmas	Director at Large
Joseph DuBose	Director at Large
Samir Fakhry	Director at Large
Oscar Guillamondegui	Director at Large
Elliott Haut	Director at Large
Babak Sarani	Director at Large
Kevin Schuster	Director at Large
Nicole Stassen	Director at Large

PAST MEETINGS

1988	*Colony Beach Resort*	Longboat Key, FL
January 12-14, 1989	*Colony Beach Resort*	Longboat Key, FL
January 10-13, 1990	*The Registry Hotel*	Naples, FL
January 17-19, 1991	*Colony Beach Resort*	Longboat Key, FL
January 16-18, 1992	*Hamilton Princess Hotel*	Bermuda
January 13-16, 1993	*Colony Beach & Tennis Resort*	Longboat Key, FL
January 12-15, 1994	*The Princess Hotel & Casino*	Freeport, Bahamas
January 11-14, 1995	*Sanibel Harbour Resort & Spa*	Ft. Myers, FL
January 10-13, 1996	*Walt Disney World Dolphin*	Lake Buena Vista, FL
January 15-18, 1997	*Sanibel Harbour Resort & Spa*	Ft. Myers, FL
January 14-17, 1998	*Sanibel Harbour Resort & Spa*	Ft. Myers, FL
January 13-16, 1999	*Wyndham Palace Resort & Spa*	Orlando, FL
January 12-15, 2000	*Sanibel Harbour Resort & Spa*	Ft. Myers, FL
January 8-13, 2001	*Westin Innisbrook Resort Tampa Bay*	Palm Harbor, FL
January 15-19, 2002	*Wyndham Palace Resort & Spa*	Orlando, FL
January 15-18, 2003	*Sanibel Harbour Resort & Spa*	Ft. Myers, FL
January 14-17, 2004	*Amelia Island Plantation*	Amelia Island, FL
January 12-15, 2005	*Marriott Harbor Beach Resort & Spa*	Ft. Lauderdale, FL
January 11-14, 2006	*Disney's Contemporary Resort*	Lake Buena Vista, FL
January 16-20, 2007	*Sanibel Harbour Resort & Spa*	Ft. Myers, FL
January 15-19, 2008	*Amelia Island Plantation*	Jacksonville, FL
January 13-17, 2009	*Disney's Yacht & Beach Club Resort*	Orlando, FL
January 19-23, 2010	*Sheraton Wild Horse Pass Resort*	Chandler, AZ
January 25-29, 2011	*Naples Grande Resort*	Naples, FL
January 10-14, 2012	*Disney's Contemporary Resort*	Lake Buena Vista, FL
January 15-19, 2013	*JW Marriott Camelback Resort*	Scottsdale, AZ
January 14-18, 2014	*Waldorf Astoria Naples*	Naples, FL
January 13-17, 2015	*Disney's Contemporary Resort*	Lake Buena Vista, FL

The Presidential Gavel Box
The Eastern Association of the Surgery of Trauma

In 2006, Michael F. Rotondo MD FACS, the 18th President of the Association commissioned Paul Gianino, a master cabinet maker from Greenville, North Carolina to create a box for the presidential gavel of the Eastern Association for the Surgery of Trauma. To this point, the gavel had been housed in a forest green fleece drawstring bag. At the writing of this, there was no institutional memory regarding the origin of the fleece bag. Upon receiving the gavel at the start of his presidency in 2005, Rotondo found this curious and decided to commission the design and construction of a more permanent home for the gavel.

Gianino, originally from Boston, Massachusetts, is a modern master taught exclusively by his father. He is nationally recognized as one of America's most talented cabinet makers. He has extensive experience building such boxes for judges, heads of council and other leaders across the country. Under Rotondo's guidance, he designed the box to hallmark both the organization as well as the time in which the box was constructed.

The box is made from 19th century Honduran mahogany with over 100 separate hand made parts. The top features the rising sun of EAST inlaid with burled elm on a background of Cuban mahogany framed in a rectangular band of holly. The sides of the box feature hand crafted raised panels. The cover of the box is attached with geometric gold plated stop hinges from the 1860's. So that the gavel may be displayed with the cover open, an engraved sterling silver plate with the EAST insignia and the words, "The Presidential Gavel", was applied to the inside cover and an internal glass dust cover was hinged into the box in a hand-crafted frame. Even the inside cover of the frame for the glass has original detailed beveled molding to hold it in place. The gavel and sound block sit in felt covered custom cradles. No traditional stains were used in the development of the piece but rather a series of acid washes applied in such a fashion that the darkness and richness of the wood is maximized. The finish is in simple shellac.

In an effort to hallmark the piece to the time and to EAST's commitment to the care of our wounded warriors, Rotondo asked Colonel Donald H. Jenkins, United States Air Force and Joint Theater Trauma System Chief in the Iraq War at the time, to supply some remembrance of the conflict to incorporate into the design of the gavel box. Colonel Jenkins was serving on the EAST Board of directors as Chairman of the Ad Hoc Military Committee. After a 210 day deployment throughout most of 2006, Jenkins returned with an SOF Technical Tourniquet used on a 22 year old United States Marine whose life was saved as a result of application of the device and subsequent operation by Commander Tracy R. Bilski, United States Navy and a member of EAST. In fact, a number of EAST members deployed at the time cared for this young marine throughout the echelons of care. The tourniquet was incorporated into the box by utilizing the aluminum rotation bar (twister) as a cover handle secured in place with a hand turned mahogany knob. If you examine the handle carefully, you can still see evidence of the marine's dried blood encrusted in the grooves of the twister. A piece of the tourniquet's nylon strap was used to secure the gavel in its cradle and the tourniquet label was preserved to authenticate the piece.

The box was presented as a gift to the organization by Dr. Rotondo to Michael Pasquale, the 19th President of the association on the occasion of the gavel exchange to Kimberly Nagy, the 20th and first woman President of the Eastern Association for the Surgery of Trauma at the Scientific Assembly in 2007.

The History of the **EAST** Gavel Box

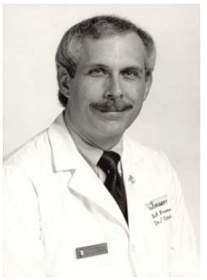
The following speech was given by Col. Donald Jenkins, MD
during the 20th EAST Annual Scientific Assembly
January 16-20, 2007 ♦ Fort Myers, Florida

I was asked by President Rotondo to make a brief presentation of a significance which will become apparent shortly. Yesterday, I was surprised to discover that 5% of Active EAST members have been deployed to war in Iraq/Afghanistan in the past year alone. But, let me share with you a story of a 22 y.o. Lance Corporal in the USMC who was injured on the October 2006 during operations near Al Taqqadam, Iraq, about 30 miles west of Baghdad in Al Anbar Province, between Fallujah and Ramadi. During a firefight, he sustained both upper and lower extremity gunshot wounds. A Navy Corpsman applied a SOF-T tourniquet on his leg due to massive hemorrhage and he was taken to the US Navy Forward Resuscitative Surgical site in Al Taqqadam, aka, TQ Surgical. There, CDR Tracy Bilski, US Navy and EAST Member, performed life and limb salvage surgery, to include vascular shunt of his femoral artery. The patient was then evacuated to the Air Force Theater Hospital in Balad, Iraq where further resuscitation and salvage surgery were performed and definitive vascular repair was accomplished. Upon entry at Balad, Maj Michelle Park, USAF and an EAST member, oversaw his surgical and critical care.

His presenting blood pressure was 100/62, BD 7, INR 1.6 and Hgb 7; all independent risk factors for massive transfusion and associated with a 40% mortality. Overall, he received 11 units PRBC, 8 units cryo, 1 6-pack of platelets, 5 units of plasma and 5 units of whole blood in addition to 4 doses of recombinant fVIIa.

After this stabilizing surgery, he remained critically ill and ventilator dependent, but was flown by Air Force Critical Care Air Transport Team (trained before their deployment by Col Jay Johannigman, USAF and EAST member and Maj Stephen Barnes, USAF and an EAST member) to Landstuhl Regional Medical Center in Germany, where Col Warren Dorlac, USAF and EAST member assumed his care. This Military Trauma Center is run by Col Stephen Flaherty, USA and EAST member; and the Trauma Program Manager is Ms. Kathie Martin, EAST Associate Member. After several days of critical care and serial wound washouts, during which visiting Senior Surgeon Dr Donald Trunkey, former USA surgeon and Honorary EAST member, participated in his care, thanks to a program spearheaded by Bill Schwab, formerly US Navy and past president of EAST, this Marine was extubated and transferred to Bethesda National Naval Medical Center, to the care of CDR Jim Dunne and CAPT Phil Perdue, US Navy and EAST members. He is now recovering as an outpatient at Camp Pendleton, California.

The care of this Lance Corporal is perhaps the quintessential case of modern combat casualty care and highlights the participation of EAST members in the military: casualty care in echelons; use of tourniquets by field medics; far forward damage control surgery, including the use of vascular shunts; definitive vascular repair in-theater; use of 'damage control resuscitation' (to include ultra-fresh whole blood, PRBC:plasma in 1:1 ratio, use of platelet pheresis platelets collected in combat zone and use of rVIIa), then; CCATT transport out of theater; and rapid transition to care in the continental United States across the continuum of care with multiple surgeries along the way. These protocols, procedures and guidelines have been drafted, published, implemented and refined over the last several years with significant input and oversight from EAST members to include, CAPT Peter Rhee, USN, COL John Holcomb, USA, COL David Burris, USA, COL Brian Eastridge, USA, COL Stephen Flaherty, USA and COL Donald Jenkins, USAF. At every stop, EAST members had a vital role in his care. The SOF-T tourniquet 'built in' to the Presidential Gavel box was used on this Marine.



Scott B. Frame, MD Memorial Lecture of the EAST Foundation

east Foundation

Scott Barnhart Frame personified the Eastern Association for the Surgery of Trauma (EAST). He was young, energetic, and an enthusiastic mentor for medical students, surgical residents and his peers. He fought for well-developed comprehensive systems of trauma care and he believed that the disease of trauma did have solutions that could improve its outcome.

Scott Frame was born on January 31, 1952 in Portsmouth, Virginia. However, he grew up in Albuquerque, New Mexico, graduating from high school in 1970 and then attending the University of New Mexico for both his undergraduate training and medical school. He received his MD degree in 1980 from the University of New Mexico. He spent the next 10 years of his life on active duty in the navy. He returned to Portsmouth, Virginia for his internship and residency in general surgery, completing that training in 1986. He did a fellowship in Trauma and Critical Care with Dr. Norman McSwain at Tulane in New Orleans from 1987-1988. He completed two operational tours in the navy—the first on the USS Raleigh as a general medical officer and the second on the USS Theodore Roosevelt (CVN-71), serving as the general surgeon on her commissioning crew, making him a "plankowner" of the Roosevelt. He completed his naval service at the Naval Hospital in San Diego.

In August of 1990, Dr. Frame joined the faculty at the University of Tennessee Medical Center in Knoxville, Tennessee as an Assistant Professor of Surgery. He remained there for 7 years, serving as the Director of the Trauma Service and the Director of Surgical Endoscopy while advancing to Associate Professor of Surgery with tenure. He also worked closely with pre-hospital providers and Lifestar Aeromedical Services. In October of 1997 he resigned from UT-Knoxville to accept a position with the University of Cincinnati as Full Professor of Surgery and Director of the Division of Trauma/Critical Care in the Department of Surgery. He remained in this position until his untimely death from colon cancer in March of 2001 at the age of 49.

Dr. Frame was known as a superb technical surgeon who would do anything necessary to save his injured patient, but also had the judgment that is required to know when not to operate. He believed that all patients needed to be treated the same, to prevent making mistakes. He was an excellent teacher and mentor, winning teaching awards in every program he served. He expected that those he taught would be as passionate about surgery and trauma as he was himself. He was loyal to those he worked with and respected and he was always honest. He would take strong positions and argue for them, but he would also consider opposing points of view. If the logic of the opposition proved correct, he would readily admit that he was wrong.

Dr. Frame was very active in the early days of EAST. He was a charter member of the organization who served in many ways. He was on the membership committee and the program committee, playing an active role in these committees as they helped establish the reputation of EAST and powered its early growth. He was actively involved in the scientific program at EAST, submitting abstracts and manuscripts to the program and encouraging his residents and fellows to do the same. He and his wife Joyce attended every annual meeting of EAST that was held until he became too ill from his cancer to attend.

Dr. Frame's contributions to the scientific literature in trauma were extensive and continued right up to the time of his death. Besides many important articles on trauma, Dr. Frame edited a book on Retroperitoneal Trauma with Dr. McSwain. At the time of his death, Dr. Frame was again serving with Dr. McSwain as editor of the Fifth Edition of the PHTLS training manual. Dr. Frame served as the associate medical director of PHTLS from 1994 on, continuing and expanding his long interest in pre-hospital care and taking the course around the world. He had accepted the position of Medical Director of PHTLS, to be assumed at the time of the publication of the Fifth Edition of the training manual.

Dr. Frame was a mentor, an inspiration, and a friend to many of the early leaders and members of EAST. He and his wife, Joyce, were always together at meetings and at home, and always ready to serve the trauma community in any way that they could. Joyce has continued to serve EAST in supporting this lectureship in Scott's name to ensure that his memory and his contributions to trauma care live on. As his good friend and mentor, Dr. Norman McSwain said, Scott Frame "embodied the trauma surgeon—Outspoken when he believed that he was correct, loving when he was needed, aggressive in the care of his patients and an excellent teacher to residents, other physicians and to the pre-hospital providers of the world."

Scott B. Frame, MD Memorial Lecturers

2003 Charles L. Rice, MD, FACS
2004 Donald D. Trunkey, MD, FACS
2005 Steven R. Shackford, MD, FACS
2006 L.D. Britt, MD, MPH, FACS
2007 Thomas Russell, MD, FACS
2008 Gregory J. Jurkovich, MD, FACS
2009 Will P. Chapleau, EMT-P, RN, TNS
2010 Howard R. Champion, MD, FRCS, FACS
2011 David B. Hoyt, MD, FACS
2012 Richard Carmona, MD, MPH, FACS
2013 Norman E. McSwain, Jr., MD, FACS
2014 David V. Feliciano, MD, FACS
2015 Paul A. Taheri, MD, MBA, FACS
2016 Mark A. Malangoni, MD, FACS

The Raymond H. Alexander MD Resident Paper Competition of the EAST Foundation

Raymond H. Alexander MD received his undergraduate degree from Princeton University and his MD from Duke. Following military service to the country, he moved to Jacksonville as one of the first board certified vascular surgeons in the state of Florida.

Dr. Alexander was medical director of the trauma program and Chief of Surgery at the University of Florida Health Science Center in Jacksonville. He also served as medical director of Florida's Emergency Medical Services office. His accomplishments included fostering a statewide trauma system before his untimely death to cancer in 1992.

In addition to the EAST Foundation Resident Paper Competition, several other awards and honors bear his name, a testament to his impact on trauma care. The Raymond H. Alexander Medical Director of the Year is given by Florida Department of Health's Bureau of Emergency Medical Services to a physician who assumed a leadership role in EMS with the community or nationally and demonstrates excellence in the areas of quality assurance/improvement and medical control, as well as the promotion and use of new medical trends and technologies. The American College of Surgeons Florida Chapter annually presents the Raymond H. Alexander, MD Award to a surgeon for outstanding dedication and service to the medical profession in the field of surgery, as exemplified by the devoted and unselfish life of Dr. Ray Alexander. The Florida Committee on Trauma holds the Annual Raymond Alexander Visiting Professor, a traveling series of Grand Rounds lectures by a national expert who visits trauma centers across the state over one week.

Dr. Alexander was one of ten surgeons recognized as a Founding Board Member of EAST.

His lifelong dedication to organized care for the injured is an inspiration to the membership and friends of EAST. The Annual EAST Foundation Resident Paper Competition held during the Annual Scientific Assembly of the Eastern Association for the Surgery of Trauma is named in his honor.

Visit the EAST website, www.east.org, for a listing of Raymond H. Alexander, MD Resident Paper Competition recipients.

John M. Templeton, Jr., MD
1940-2015

Introduction written by C. William Schwab, MD; Past President, EAST

Thank you, Jack. Jack and Pina Templeton's dedication to children, education, character, religion, and prayer in our lives and for America is widely known, and the Eastern Association for the Surgery of Trauma is so fortunate to have them. It was my good fortune to have had Jack as a teacher, faculty, colleague, and friend for more than 35 years. In 1975, Jack reported to the Portsmouth Naval Hospital as the Chief of Pediatric Surgery, where I was a chief resident. Our interactions were over the most difficult pediatric cases and through that, I learned of Jack's devotion and determination to help every sick child and their family through their time of crisis. He personalized every case and worked alongside each of us at Portsmouth, to carry each and every child back to health. He lived the meaning of "teamwork." So it was no surprise that when I was recruited to PENN, 20 years later, I found Jack developing the Pediatric Trauma Center at CHOP. Jack was exactly the same: devoted, energetic, and determined. Our relationship flourished as we both struggled to grow and mature these two centers, which were a mere fifty feet apart. Our city was being ravaged with firearm injury at this time. At perhaps the lowest moment of this epidemic, it was Jack Templeton who catalyzed us to seek to understand the root causes and look for some way to lower the devastating toll for Philadelphia youth. In a simple request between friends, Jack seeded the Firearm and Injury Center at Penn and birthed an interdisciplinary group of scholars who some 20 years later continue to advance meaningful dialogue about protecting Americans.

Jack gave up practice to direct the Templeton Foundation several years ago, and I felt a great loss to the surgical community. However, in his passions, he continued forward in even more meaningful ways. In those subsequent years, his leadership supported advancing the public's health, moving medicine toward a broader scientific inquiry of life's big questions, and of course, improving the safety of the public, most particularly our youth. His charge to EAST was lofty: "Understand how injury occurs, and through science identify effective interventions, empower the country through this knowledge." Jack Templeton elevated EAST, and with his distinctive hallmark, given us a unique purpose. We owe Jack a great deal.

Echoing Dr. Schwab's message, both EAST and the EAST Foundation are truly appreciative of Drs. Jack and Pina Templeton's support which has aided in the growth and development of both organizations. Through the support of the Templeton's, EAST and the EAST Foundation are able to award on an annual basis, the John M. Templeton, Jr., MD Injury Prevention Research Scholarship of the EAST Foundation, and the Cox-Templeton Injury Prevention Paper Competition. The John M. Templeton, Jr. MD Injury Prevention Research Scholarship's intent is an interventional trial in the field of injury prevention, while in 2012 the award of the Cox-Templeton Injury Prevention Paper Competition of the EAST Foundation was renamed to recognize the contributions of John Templeton, Jr., MD and Ms. Julia Cox-McCarter in the area of Injury Prevention.

As indicated above, John M. Templeton, Jr., MD led an inspirational career and life. Dr. Templeton was President and Chairman of the John Templeton Foundation, and directed all Foundation activities in pursuit of its core mission to serve as a philanthropic catalyst for discovery in areas engaging life's biggest questions in science, theology, philosophy, individual freedom, free enterprise and character virtues. He worked closely with the Foundation's staff and international board of advisors of more than 50 leading scholars, scientists, researchers and theologians to develop substantive programs in these endeavors.

Dr. Templeton was actively involved in the Foundation since its inception in 1987. In 1995, he retired from his medical practice to serve full-time as president of the Foundation. His more than 25-year career as a physician and long-held spiritual beliefs provide both the formal science training and the commitment to advance the Foundation's work.

After receiving a Bachelor of Arts degree from Yale University in New Haven, Connecticut, Dr. Templeton earned his medical degree from Harvard Medical School in Boston. He completed his internship and residency in surgery at the Medical College of Virginia in Richmond and subsequently trained in pediatric surgery under Dr. C. Everett Koop at The Children's Hospital of Philadelphia. After serving two years in the U.S. Navy, he returned to The Children's Hospital of Philadelphia in 1977, where he served on the staff as pediatric surgeon and trauma program director. He also served as professor of pediatric surgery at the University of Pennsylvania.

Dr. Templeton was board certified in pediatric surgery and surgical critical care and was a fellow of the American College of Surgeons. He served as a board member of the American Trauma Society and as a president of its Pennsylvania division. He is a member of the Cradle of Liberty Council of the Boy Scouts of America, the Board of Trustees of Eastern University, the Boards of the Foreign Policy Research Institute, Philadelphia College of Physicians, National Bible Association, the Session for Proclamation Presbyterian Church and the American Association for the Surgery of Trauma. He published numerous papers in medical and professional journals, in addition to three books, *A Searcher's Life* and *Thrift and Generosity: The Joy of Giving*, and an updated version of his autobiography, entitled, *John M. Templeton, Jr: Physician, Philanthropist, Seeker.*

Dr. Templeton is survived by his wife, Dr. Josephine Templeton who is retired from the practice of pediatric anesthesiology at The Children's Hospital of Philadelphia. They have two daughters, Heather and Jennifer, five grandsons and one granddaughter.

Visit the EAST website, www.east.org, for a listing of recipients of the John M. Templeton, Jr., MD Injury Prevention Research Scholarship and the Cox-Templeton Injury Prevention Paper Competition

Major John P. Pryor, MD, FACS
US Army Reserve Medical Corps
Jan 23, 1966–Dec 25, 2008
Killed in action in Mosul, Iraq

Photo taken by: Major Scott J. Pomygalski, CRNA

The John P. Pryor, MD Distinguished Service Award in Military Casualty Care is an annual award presented at the EAST Annual Scientific Assembly. The award recognizes EAST members who have distinguished themselves in the field of military casualty care. EAST members, who through a singular advancement or a body of work in the field of military casualty care or who have demonstrated a commitment to improving outcomes for those who sustain injury in modern military theaters of conflict are considered for this award.

The John P. Pryor, MD Distinguished Service Award in Military Casualty Care was established by the Military Ad Hoc Committee of the Eastern Association for the Surgery (EAST) and approved by the EAST Board of Directors in April, 2011. The first award was presented at the 25th EAST Annual Scientific Assembly, January 10-14, 2012 in Lake Buena Vista, Florida.

Award Recipients

2012 Col. Warren Dorlac, MD, FACS
2013 COL (ret.) John B. Holcomb, MD, FACS
2014 C. William Schwab, MD, FACS
2015 Donald H. Jenkins, MD, FACS, DMCC, Colonel, USAF (retired)

OVERALL SCHEDULE

Eastern Association for the Surgery of Trauma (EAST)
29th Annual Scientific Assembly
OVERALL SCHEDULE

TUESDAY, JANUARY 12, 2016

7:30 am-7:00 pm	Registration	**Cibolo Canyon Ballroom Foyer**
7:00 am-10:00 am **and** 5:00 pm-7:00 pm	Speaker Preparation Room	**Azalea, Lobby Level**
Workshop - Ticketed session, additional fees apply. Pre-registration required.		
8:00 am-4:00 pm	Strategic Professional Development: An EAST Leadership Development Workshop *Presented by the EAST Career Development Section*	**Cibolo Canyon Ballroom 3**
12:00 am-4:00 pm	Manuscript and Literature Review Section Meeting	**Azalea, Lobby Level**
12:00 pm-5:00 pm	Exhibit Set-up	**Cibolo Canyon Ballroom 7-10**
Workshops - Ticketed session, additional fees apply. Pre-registration required.		
1:00 pm-6:00 pm	Bridging the Gap: A Fellow's Workshop *Presented by the EAST Career Development Section*	**Sunday House, Lobby Level**
1:00 pm-6:00 pm	Research Basics for the Young Acute Care Surgeon - I Have a Research Question, What's Next? *Presented by the EAST Emergency General Surgery Section*	**Cibolo Canyon Ballroom 4**
1:00 pm-3:45 pm	EAST Foundation Board of Trustees Meeting	**Sunflower-Wisteria, Lobby Level**
4:00 pm-8:30 pm	EAST Executive Committee & Board of Directors Meetings 4:00 pm-4:30 pm - Executive Committee 4:30 pm-8:30 pm - Board of Directors	**Sunflower-Wisteria, Lobby Level**
Industry Education Symposia		
6:00 pm-9:00 pm	DePuy Synthes (Lecture)	**Peony, Lobby Level**
6:00 pm-9:00 pm	Haemonetics Corporation (Lecture)	**Magnolia, Lobby Level**

WEDNESDAY, JANUARY 13, 2016

6:00 am-5:00 pm	Registration	**Cibolo Canyon Ballroom Foyer**
6:00 am-5:00 pm	Speaker Preparation Room	**Azalea, Lobby Level**
6:30 am-7:30 am	**EAST Section Meetings – All Meeting Rooms Lobby Level**	
	Advanced Practitioners Section	**Magnolia**
	Career Development Section	**Peony**
	Injury Control & Violence Prevention Section	**Periwinkle-Verbena**
	Member Recruitment and Retention Section	**Sunflower-Wisteria**
	Online Education Section	**Goldenrod**
	Research-Scholarship Section	**Sunday House**
	Seniors Section	**Larkspur**
7:00 am-12:00 pm	Scientific Posters Setup	**Nelson Wolff Exhibit Hall Foyer Level 1**
7:30 am-8:30 am	Continental Breakfast provided in the Exhibit Hall	**Cibolo Canyon Ballroom 7-10**
7:30 am-5:00 pm	Exhibits	**Cibolo Canyon Ballroom 7-10**

WEDNESDAY, JANUARY 13, 2016 (CONTINUED)

7:30 am-8:00 am	Opening Ceremony - Flag Ceremony and Opening Remarks	**Cibolo Canyon Ballroom 1-6**
8:00 am-9:40 am	Scientific Session I: Raymond H. Alexander, MD Resident Paper Competition of the EAST Foundation *(Papers 1-5)* Moderators: Stanley J. Kurek, Jr, DO & Samuel W. Ross, MD, MPH *(2015 Clinical Science Paper Recipient)*	**Cibolo Canyon Ballroom 1-6**
9:40 am-10:00 am	Break - Refreshments provided in the Exhibit Hall	**Cibolo Canyon Ballroom 7-10**
10:00 am-12:00 pm	Scientific Session II: Raymond H. Alexander, MD Resident Paper Competition of the EAST Foundation *(Papers 6-11)* Moderators: Nicole Stassen, MD & Sean P. McCully, MD, MS *(2015 Basic Science Paper Recipient)*	**Cibolo Canyon Ballroom 1-6**
12:00 pm-1:00 pm	Visit the Exhibit Hall Specialty Priced - Grab and Gab Lunch Options	**Cibolo Canyon Ballroom 7-10**
12:00 pm-5:00 pm	View Scientific Posters	**Nelson Wolff Exhibit Hall Foyer, Level 1**

Today's Topics 1-5 - Ticketed session, additional fees apply. Pre-registration required.
All meeting rooms, Lobby Level

12:00 pm-1:00 pm	TT 1-High Yield Trauma Updates	**Sunflower-Wisteria**
12:00 pm-1:00 pm	TT 2-Pediatric Conundrums	**Peony**
12:00 pm-1:00 pm	TT 3-Was It Something I Said?! Optimizing Documentation for the Trauma/Acute Care Surgeon/Intensivist	**Magnolia**
12:00 pm-1:00 pm	TT 4-From Research to Publication: Writing a Scientific Manuscript	**Periwinkle-Verbena**
12:00 pm-1:00 pm	TT 5-Found in Translation: The Use of Interpreters in the Trauma Bay	**Goldenrod**

1:00 pm-2:00 pm	**Parallel Quick Shots** Quick Shots Session I - Systems/Emergency General Surgery *(Quick Shots 1-10 presented)*	**Cibolo Canyon Ballroom 1-6**
1:00 pm-2:00 pm	Quick Shots Session II - Clinical *(Quick Shots 11-20 presented)*	**Nelson Wolff Exhibit Hall A Level 1**
2:00 pm-3:00 pm	Scientific Papers That Should Have Changed Your Practice *Presented by the EAST Manuscript and Literature Review Section*	**Cibolo Canyon Ballroom 1-6**
3:15 pm-4:30 pm	***EAST Annual Business Meeting - Open to All EAST Members***	**Cibolo Canyon Ballroom 1-6**
4:30 pm-5:30 pm	**Parallel Plenary Session** Publish (and Participate)…or Perish: An Insider's Guide to Manuscripts, Peer Reviewing, Joining the Editorial Board, and Beyond *Presented by the EAST Career Development Section and the Online Education Section*	**Cibolo Canyon Ballroom 1-6**
4:30 pm-5:30 pm	**Parallel Plenary Session** Throwing a Lasso Around the "Orange Book" *Presented by the Society of Trauma Nurses*	**Nelson Wolff Exhibit Hall A Level 1**

EAST Receptions & Special Events

5:45 pm-7:00 pm	EAST Foundation Donor & Exhibitor Appreciation Reception *(By invitation only)*	**Periwinkle-Verbena**
6:30 pm-8:30 pm	Opening Reception - Ticketed Event *(RSVP required)*	**Event Lawn 2 or Nelson Wolff Exhibit Hall C** *(in case of inclement weather)*

THURSDAY, JANUARY 14, 2016

7:00 am-4:00 pm	Registration	**Cibolo Canyon Ballroom Foyer**
6:00 am-5:00 pm	Speaker Preparation Room	**Azalea**
6:45 am-7:45 am	**EAST Section Meetings – All Meeting Rooms Lobby Level**	
	Emergency General Surgery Section	**Periwinkle-Verbena**
	Guidelines Section	**Sunflower-Wisteria**
	Mentoring Section	**Magnolia**
	Military Section	**Peony**
	Annual Scientific Assembly Section	**Iris-Lily**
	Technology and Information Management Section	**Larkspur**
	Multicenter Trials Section	**Goldenrod**
7:30 am-8:30 am	Continental Breakfast provided in the Exhibit Hall	**Cibolo Canyon Ballroom 7-10**
7:30 am-1:00 pm	Exhibits	**Cibolo Canyon Ballroom 7-10**
7:30 am-5:00 pm	View Scientific Posters *Scientific Posters Rounds will take place from 5:00 pm-6:00 pm*	**Nelson Wolff Exhibit Hall Foyer**
8:00 am-10:00 am	Scientific Session III-A: Trauma *(Papers 12-17)*	**Cibolo Canyon Ballroom 1-6**
8:00 am-10:00 am	Scientific Session III-B: Cox-Templeton Injury Prevention Paper Competition of the EAST Foundation *(Papers 18-23)*	**Nelson Wolff Exhibit Hall A Level 1**
10:00 am-10:30 am	Break - Refreshments provided in the Exhibit Hall	**Cibolo Canyon Ballroom 7-10**
10:30 am-11:30 am	**Scott B. Frame, MD Memorial Lecture of the EAST Foundation** ***The Makings of a Trauma Surgeon*** **Mark Malangoni, MD, FACS** **Associate Executive Director, American Board of Surgery**	**Cibolo Canyon Ballroom 1-6**

Today's Topics 6-10 - Ticketed session, additional fees apply. Pre-registration required.
All meeting rooms, Lobby Level

11:30 am-12:30 pm	TT 6-Quality Improvement: The Good, The Bad, and The Ugly	**Sunflower-Wisteria**
11:30 am-12:30 pm	TT 7-Management of Abdominal Solid Organ Injuries in Children: What We Complain About Behind Your Backs	**Goldenrod**
11:30 am-12:30 pm	TT 8-I Have a Consult for You…The Acute Abdomen in the Surgical ICU	**Peony**
11:30 am-12:30 pm	TT 9-Caring for the Elephant in the Room	**Magnolia**
11:30 am-12:30 pm	TT 10-Initial Pharmacotherapy in the Trauma Bay	**Periwinkle-Verbena**

1:00 pm-1:45 pm	EAST Annual Oriens Presentations *Supported by the EAST Foundation through an unrestricted grant from Polk Family Charitable Foundation* 1:00 pm-1:30 pm - Keynote Address - Team of Teams Speaker: Donald H. Jenkins, MD, FACS 1:30 pm-1:45 pm - 2016 EAST Oriens Essay Presentations Fellow Winner – Dylan R. Nieman, MD, PhD Resident Winner – Samuel Wade Ross, MD, MPH	**Cibolo Canyon Ballroom 1-6**

Workshop – Ticketed session, additional fees apply. Pre-registration required.

1:30 pm-5:00 pm	Advanced Practitioners in Trauma Workshop - How to Build and Sustain a Successful Advanced Practitioner Program *Presented by the EAST Advanced Practitioners Section*	**Iris-Lily, Lobby Level**

1:45 pm-3:15 pm	**Parallel Plenary Session** Multicenter Study Recruitment Proposals	**Cibolo Canyon Ballroom 1-6**
1:45 pm-3:15 pm	**Parallel Plenary Session** Engage the Masters	**Nelson Wolff Exhibit Hall A Level 1**

THURSDAY, JANUARY 14, 2016 (CONTINUED)

3:15 pm-5:00 pm	No Suit, No Problem: Fostering Relationships & Building Careers	**Nelson Wolff Exhibit Hall B Level 1**
5:00 pm-6:00 pm	Scientific Poster Rounds Poster Professors Group I (Posters 1-6) Luis J. Garcia, MD & Martin D. Zielinski, MD Group II (Posters 7-12) Randeep S. Jawa, MD & Carlos Rodriguez, DO, MBA Group III (Posters 13-20) Jamie Jones Coleman, MD & Samir Fakhry, MD Group IV (Posters 21-26) A. Britton Christmas, MD & Tanya L. Zakrison, MD, MPH Group V (Posters 27-32) Matthew Martin, MD & Jose Pascual Lopez, MD, PhD Group VI (Posters 33-39) Mayur B. Patel, MD, MPH & Melissa Warta, MD	**Nelson Wolff Exhibit Hall Foyer Level 1**

EAST Receptions & Special Events

6:00 pm-6:45 pm	Society of Trauma Nurses Networking Reception *(By invitation only)*	**Sunday House, Lobby Level**
6:00 pm-10:30 pm	Kids Klub Party - Pre-Registration Required!	**Indian Paintbrush-Larkspur Lobby Level**
6:30 pm-9:30 pm	EAST President's Reception & Dinner *(By invitation only)*	**San Antonio Terrace & Grand Oaks Ballroom D-F Level 2**

FRIDAY, JANUARY 15, 2016

Industry Focus Group

6:00 am-7:00 am	Ethicon US LLC (Focus Group)	**Azalea, Lobby Level**
6:30 am-12:30 pm	Registration	**Cibolo Canyon Ballroom Foyer**
7:00 am-12:30 pm	Speaker Preparation Room	**Azalea, Lobby Level**

Today's Topics 11-15 - Ticketed session, additional fee apply. Pre-registration required.
All meeting rooms, Lobby Level

7:00 am-7:55 am	TT 11-Assessing for and Reversing Coagulopathy	**Sunflower-Wisteria**
7:00 am-7:55 am	TT 12-Beyond Methodology: Understanding and Implementing EAST Practice Management Guidelines from the 2015 Authors	**Peony**
7:00 am-7:55 am	TT 13-The Bigger They Are…Surgical Emergencies and "Damage Control Bariatrics" for the Acute Care Surgeon	**Goldenrod**
7:00 am-7:55 am	TT 14-Optimizing Success for the Young Researcher: Tips for Planning, Organizing, Funding, & Executing Your Multicenter Trial	**Magnolia**
7:00 am-7:55 am	TT 15-Geriatric Trauma Service (GTS): Practices, Pitfalls & Outcomes	**Periwinkle-Verbena**

8:00 am-9:00 am	Continental Breakfast provided in the Exhibit Hall	**Cibolo Canyon Ballroom 7-10**
8:00 am-11:30 am	Exhibits	**Cibolo Canyon Ballroom 7-10**
8:00 am-10:00 am	Scientific Session IV-A: Coagulation *(Papers 24-29)*	**Cibolo Canyon Ballroom 1-6**
8:00 am-10:00 am	Scientific Session IV-B: Emergency General Surgery *(Papers 30-35)*	**Nelson Wolff Exhibit Hall A Level 1**
10:00 am-11:00 am	**Presidential Address** ***Resilience…*** **Stanley J. Kurek, Jr., DO, FACS**	**Cibolo Canyon Ballroom 1-6**
11:00 am-11:15 am	Gavel Exchange	**Cibolo Canyon Ballroom 1-6**
11:15 am-12:00 pm	**EAST & EAST Foundation Awards Ceremony** • *Raymond H. Alexander, MD Resident Paper Competition of the EAST Foundation* • *Best Manuscript Award* • *EAST Oriens Award* • *John P. Pryor, MD Distinguished Service in Military Casualty Care Award* • *Cox-Templeton Injury Prevention Paper Award of the EAST Foundation* • *2016 John M. Templeton, Jr., MD Injury Prevention Research Scholarship of the EAST Foundation* • *2016 Trauma Research Scholarship of the EAST Foundation* • *2015 Health Policy and Management Scholarship Recipient of the EAST Foundation* • *2016 Leadership Development Workshop Scholars Recognition* • *2016 Society of Trauma Nurses/EAST Foundation Nurse Fellow Recipient*	**Cibolo Canyon Ballroom 1-6**

FRIDAY, JANUARY 15, 2016 (CONTINUED)

12:00 pm-2:00 pm — Practice Management Guidelines (PMGs)Plenary Session — **Cibolo Canyon Ballroom 1-6**
Presented by the EAST Guidelines Section

PMGs scheduled to be presented (*subject to change*):

- Large Bowel Obstruction - Paula Ferrada, MD
- Venous Thromboembolism Prophylaxis in Traumatic Brain Injury - Tiffany Overton, MA, MPH
- Anticoagulation and Antiplatelet Reversal in Traumatic Intracranial Hemorrhage - Urmil Pandya, MD
- Treatment of Pancreatic Trauma - Vanessa Ho, MD, MPH
- Monitoring Modalities, Assessment of Volume Status, and Endpoints of Resuscitation - David Plurad, MD
- Beta Blockers After Traumatic Brain Injury - Mayur Patel, MD, MPH
- Diaphragm Injury - Amy McDonald, MD
- Prevention of Sports Concussions - Toby Enniss, MD
- Appendicitis - Mayur Narayan, MD, MPH, MBA
- Damage Control Resuscitation/Anti-Fibrinolytic Practice Management - Mansoor Khan, MBBS, MRCS, FRCS
- Prevention of ATV Injury - D'Andrea Joseph, MD

EAST Receptions & Special Events

2:30 pm-5:00 pm — Annual EAST Foundation Dodgeball Tournament
10 Year Anniversary of Ducking and Dodging! — **Tennis Courts or Nelson Wolff Exhibit Hall A** *(in case of inclement weather)*

5:00 pm-7:00 pm — Family Reception/Barbeque - Ticketed Event *(RSVP required)* — **Event Lawn 1 or Cibolo Canyon Ballroom 1-5** *(in case of inclement weather)*

SATURDAY, JANUARY 16, 2016

8:00 am-10:30 am — EAST Board of Directors Meeting (by invitation) — **Periwinkle-Verbena, Lobby Level**

Workshops - Ticketed session, additional fees apply. Pre-registration required.

7:30 am-1:00 pm — **Basic Endovascular Skills for Trauma© Workshop** — **Bluebonnet-Dogwood Lobby Level**

7:30 am-9:30 am	Lectures
9:45 am-11:00 am	Skills Lab 01*
11:30 am-12:45 pm	Skills Lab 02*

*Skills Labs:
Attendees will be pre-assigned to a skills lab. Each lab is limited to 24 people. You may only attend the skills lab to which you were assigned.

7:45 am-3:30 pm — **Optimal Trauma Center Organization and Management Course** — **Begonia-Bottle Brush Lobby Level**
Presented by the Society of Trauma Nurses

SCIENTIFIC SCHEDULE

Eastern Association for the Surgery of Trauma (EAST)
29th Annual Scientific Assembly
SCIENTIFIC SESSIONS

WEDNESDAY, JANUARY 13, 2016

7:30 am - 8:00 am **Flag Presentation and Opening Remarks**
Location: Cibolo Canyon Ballroom 1-6, Level 2

SCIENTIFIC SESSION I – RAYMOND H. ALEXANDER, MD RESIDENT PAPER COMPETITION OF THE EAST FOUNDATION
Presiding: Stanley J. Kurek, Jr., DO & Samuel W. Ross, MD, MPH
Location: Cibolo Canyon Ballroom 1-6, Level 2

8:00 am	#1	IN BLEEDING PATIENTS UNDERGOING DAMAGE CONTROL LAPAROTOMY HYPERTONIC SALINE IMPROVES PRIMARY FASCIAL CLOSURE AT THE FIRST TAKE BACK Presenter: Lindley Folkerson, MD Discussant: Margaret Lauerman, MD
8:20 am	#2	BRAIN HYPOXIA IS EXACERBATED IN HYPOBARIA DURING AEROMEDICAL EVACUATION IN SWINE WITH TBI Presenter: Steve Chun, MD Discussant: Joel Elterman, MD
8:40 am	#3	PERCUTANEOUSLY DRAINED INTRA-ABDOMINAL INFECTIONS DO NOT REQUIRE LONGER DURATION OF ANTIMICROBIAL THERAPY Presenter: Rishi Rattan, MD Discussant: Jennifer Knight, MD
9:00 am	#4	N-ACETYL CYSTEINE RENDERS AIRWAY BARRIER AT RISK FOR BACTERIAL PASSAGE AND SUBSEQUENT INFECTION Presenter: Jonathan Friedman, MD Discussant: Stephen Fann, MD
9:20 am	#5	BLOOD TRANSFUSION: IN THE AIR TONIGHT? Presenter: Benjamin Miller, MD Discussant: Brian Kim, MD
9:40 am - 10:00 am		Break – Refreshments in the Exhibit Area

SCIENTIFIC SESSION II – RAYMOND H. ALEXANDER, MD RESIDENT PAPER COMPETITION OF THE EAST FOUNDATION
Presiding: Nicole Stassen, MD & Sean P. McCully, MD, MS
Location: Cibolo Canyon Ballroom 1-6, Level 2

10:00 am	#6	THERE'S AN APP FOR THAT: A HANDHELD SMARTPHONE-BASED INFRARED IMAGING DEVICE TO ASSESS ADEQUACY AND LEVEL OF AORTIC OCCLUSION Presenter: Kyle Sokol, MD Discussant: Khanjan Nagarsheth, MD
10:20 am	#7	PUSH OVER PULL: MANAGING THE SURGE IN DEMAND FOR BLOOD FOLLOWING MASS CASUALTY EVENTS Presenter: Simon Glasgow, MBBS, BSc, DMCC, MRCEM, MRCS Discussant: Eric Campion, MD
10:40 am	#8	UTILITY OF CPR IN HEMORRHAGIC SHOCK, A DOG MODEL Presenter: David Jeffcoach, MD Discussant: Jacob Glaser, MD

11:00 am	#9	NOT ALL PREHOSPITAL TIME IS EQUAL: INFLUENCE OF SCENE TIME ON MORTALITY Presenter: Joshua Brown, MD, MSc Discussant: Lance Stuke, MD
11:20 pm	#10	CREATION OF A DECISION AID FOR GOAL-SETTING AFTER GERIATRIC BURNS Presenter: Erica Hodgman, MD Discussant: Jeffrey Carter, MD
11:40 pm	#11	PERIOPERATIVE RISK FACTORS IMPACT OUTCOMES AMONG EMERGENCY VERSUS NON-EMERGENCY SURGERY DIFFERENTLY: TIME TO SEPARATE OUR NATIONAL RISK-ADJUSTMENT MODELS? Presenter: Jordan Bohnen, MD, MBA Discussant: David S. Morris, MD

End of Raymond H. Alexander, MD Resident Paper Competition of the EAST Foundation

12:00 pm – 1:00 pm **EAST Marketplace Lunch – Specially Priced – Grab & Go Lunch Options**
Location: Cibolo Canyon Ballroom 7, Level 2

12:00 pm – 1:00 pm **Today's Topics 1-5 -** Ticket required. Additional registration fee applies.

Today's Topic 1 – *Presented by the EAST Military Section*
High Yield Trauma Updates
Moderator: CAPT Carlos J. Rodriguez, MC, USN
Speakers:
MAJ Andrew Beckett, MC, Canadian Army – Devastating Pelvic Injury and Hemodynamic Instability
CDR Elliot Jessie, MC, USN – Goal Directed Resuscitation in Patients with Massive Hemorrhage
LCOL John Oh, MC, USA – Training Surgeons for Combat Trauma
CDR Travis Polk, MC, USN – Topical Hemostatic Agents
Nichole Ingalls, MD, MPH – Burns for the Non-Burn Surgeon

Today's Topics 2 – *Presented by the Pediatric Trauma Society*
Pediatric Trauma Conundrums
Moderator: Robert W. Letton, Jr. MD
Speakers:
Michael W. Dingeldein, MD – Eat When You Can, Sleep When You Can, and Almost Always Operation on a Pediatric Pancreas Injury?
Jason S. Lees, MD – Free Fluid, Abdominal Wall Bruising, and Other Signs the Bowel Might Go "Perf" in the Middle of the Night
Robert W. Letton Jr., MD – What is BCVI and How Does it Affect my Pediatric Patients?

Today's Topics 3 – *Presented by the EAST Research and Scholarship Section*
"Was it Something I Said?! Optimizing Documentation for the Trauma/Acute Care Surgeon/Intensivist
Moderator: Jose Pascual Lopez, MD, PhD
Speakers:
Joe DuBose, MD
Nicole Fox, MD, MPH

Today's Topics 4 – *Presented by the EAST Manuscript and Literature Review Section*
From Research to Publication: Writing a Scientific Manuscript 101
Moderator: Jason Smith, MD, PhD
Speakers:
Ernest E. Moore, MD – The Editing Process, the Revision Process, and What Makes a Good Manuscript from a Reviewer's and Editor's Point of View
Kevin Schuster, MD – Identifying the Best Forum for Your Idea
Jason Smith, MD, PhD – Manuscript Generation Do's and Don'ts
Ben Zarzaur, MD, MPH – Idea and Hypothesis Generation and How to Develop an Idea Into a Workable Dataset

Today's Topics 5 – *Presented by the Society of Trauma Nurses*
Found in Translation: The Use of Interpreters in the Trauma Bay
Moderator: Joan Pirrung, MSN, RN, ACNS-BC
Speaker: Sandra P. Medinilla, MD, MPH

1:00 pm – 2:00 pm **Parallel Quick Shots**

Quick Shots Session I
Presiding Elliott R. Haut, MD, PhD & Daniel Dante Yeh, MD
Location: Cibolo Canyon Ballroom 1-6, Level 2

1:00 pm	#1	MASSIVE TRANSFUSION IN NON-TRAUMA SURGICAL PATIENTS: HOW TO DEFINE IT AND WHAT IS THE ROLE OF BALANCED TRANSFUSION? Presenter: Stephanie Polites, MD Discussant: Amy Makley, MD
1:06 pm	#2	POSITIVE IMPACT OF A DESIGNATED DISCHARGE TEAM Presenter: James Bardes, MD Discussant: Cynthia Talley, MD
1:12 pm	#3	POST-OPERATIVE RESUSCITATION OF ELECTIVE SURGERY PATIENTS IN THE SURGICAL INTENSIVE CARE UNIT Presenter: Madhu Subramanian, MD Discussant: Scott Armen, MD
1:18 pm	#4	INSURANCE STATUS IS ASSOCIATED WITH COMPLEX PRESENTATION IN EMERGENCY GENERAL SURGERY PATIENTS Presenter: Jonathan Scott Discussant: Joseph Sakran, MD, MPH
1:24 pm	#5	SURGEON LED IN SITU TRAUMA TEAM SIMULATION - WHAT ARE THE BENEFITS, WHAT ARE THE COSTS? Presenter: William Leeper, MD, BSc, FRCSC Discussant: Richard Falcone, Jr., MD, MPH
1:30 pm	#6	STRUCTURED BRIEFING IMPROVES TRAUMA RESUSCITATION TEAMWORK Presenter: Susan Steinemann Discussant: Julie Nash, MSN, RN
1:36 pm	#7	EPIDEMIOLOGIC AND SPATIAL ANALYSIS OF TRAUMA TRANSFERS IN MONTREAL: A CALL FOR THE IMPLEMENTATION OF TRIAGE CRITERIA TO BYPASS SECONDARY TRAUMA CENTERS FOR DEFINITIVE TRAUMA CARE Presenter: Fadi Hamadani, BMedSc, MD, MSc Discussant: Nathan Mowery, MD
1:42 pm	#8	POLICE TRANSPORT VS. GROUND EMS: A TRAUMA SYSTEM LEVEL EVALUATION OF PRE-HOSPITAL CARE POLICIES AND THEIR EFFECT ON CLINICAL OUTCOMES Presenter: Michael Wandling, MD Discussant: Paul Chestovich, MD

1:48 pm #9 PERFORMANCE OF REGIONAL TRAUMA NETWORK: A STATE-WIDE ANALYSIS
Presenter: Jack He, MD
Discussant: Adam Fox, DO

1:54 pm #10 WHO SHOULD MANAGE THE ADOLESCENT SEVERE HEAD-INJURED PATIENT? A STATEWIDE ANALYSIS OF PEDIATRIC VERSUS ADULT TRAUMA CENTERS
Presenter: Daniel Wu, DO
Discussant: Nicole Fox, MD

Quick Shots Session II
Presiding Stephen L. Barnes, MD & Deborah M. Stein, MD, MPH
Location: Nelson Wolff Exhibit Hall A, Level 1

1:00 pm #11 PLATELET DYSFUNCTION CORRELATES WITH PROGRESSION OF INTRACRANIAL HEMORRHAGE IN TRAUMATIC BRAIN INJURY
Presenter: Bradley Putty, MD
Discussant: Alison Wilson, MD

1:06 pm #12 SAFETY OF THERAPEUTIC ANTICOAGULATION IN PATIENTS WITH TRAUMATIC BRAIN INJURY
Presenter: Kazuhide Matsushima
Discussant: Herb Phelan, III, MD

1:12 pm #13 COST-EFFECTIVENESS OF CERVICAL SPINE COLLAR CLEARANCE INTERVENTIONS IN OBTUNDED ADULT TRAUMA PATIENTS
Presenter: Audrey Ertel, MD, MS
Discussant: Therese Duane, MD

1:18 pm #14 EMBEDDING A HOSPITALIST ON THE TRAUMA SERVICE REDUCES MORTALITY AND READMISSIONS
Presenter: Mark Cipolle, MD, PhD
Discussant: Natasha Becker, MD

1:24 pm #15 OPEN CHEST CARDIAC MASSAGE OFFERS NO BENEFIT OVER CLOSED CHEST COMPRESSIONS IN PATIENTS WITH TRAUMATIC CARDIAC ARREST
Presenter: Mathew Bradley, MD
Discussant: Joseph DuBose, MD

1:30 pm #16 THE TEMPORAL RESPONSE WITH TRANEXAMIC ACID ON GUT BARRIER PROPERTIES IN AN IN VITRO MODEL OF TRAUMA-HEMORRHAGIC SHOCK
Presenter: Mark Diebel, MD
Discussant: David J. Ciesla, MD, MA

1:36 pm #17 QUANTIFICATION OF THE HEMODILUTIONAL EFFECT OF CRYSTALLOID RESUSCITATION IN A CLASS III HEMORRHAGE MODEL
Presenter: Ciara Huntington, MD
Discussant: Christopher Dente, MD

1:42 pm #18 THROMBIN GENERATION PROFILE AS PREDICTOR OF VENOUS THROMBOEMBOLISM (VTE) AFTER TRAUMA: A PROSPECTIVE CASE-COHORT STUDY
Presenter: Myung Park, MD
Discussant: Erik Streib, MD

1:48 pm #19 HYPERTONIC SALINE AFTER DAMAGE CONTROL LAPAROTOMY AND PRIMARY FASCIAL CLOSURE: PILOT STUDY
Presenter: Michelle Buehner, MD
Discussant: Jason Smith, MD, PhD

1:54 pm #20 IT IS STILL OKAY TO THROW IN THE TOWEL: AN INSTITUTION'S OPEN ABDOMINAL EXPERIENCE WITH 1533 VACUUM PACK WOUND CLOSURES
Presenter: Nicholas Drahush, MD
Discussant: Jose Diaz, MD, MPH

2:00 pm – 3:00 pm **Scientific Papers That Should Have Changed Your Practice**
Location: Cibolo Canyon Ballroom 1-6, Level 2

Presented by the EAST Manuscript and Literature Review Section
Moderator: Jason Smith, MD, PhD
Speakers:
Mark J. Seamon, MD – Adult Trauma Management
Christian J. Streck, Jr., MD – Pediatric Trauma Management
Weidun Alan Guo, MD, PhD – Emergency General Surgery
John J. Como, MD, MPH – Surgical Critical Care

3:15 pm – 4:30 pm **EAST Annual Business Meeting –** *Open to all EAST Members*
Location: Cibolo Canyon Ballroom 1-6, Level 2

4:30 pm – 5:30 pm **Parallel Plenary Session**
Publish (and Participate)…..or Perish: An Insider's Guide to Manuscripts, Peer Reviewing, Joining the Editorial Board, and Beyond
Location: Cibolo Canyon Ballroom, Level 2

Presented by the EAST Career Development Section and the Online Education Section
Moderators: Jamie Coleman, MD & Matthew Martin, MD
Speakers:
Joseph DuBose, MD – Successful Manuscripting: The Art of Science
Martin Schreiber, MD – Judge, Jury, and Sometimes Executioner: Peer-Reviewing Principles and Pointers
Matthew Martin, MD – Join the Club: How Do I Get Appointed to the Editorial Board and Beyond
Ernest E. Moore, MD – The View from the Top: Advice and Insights
All Faculty Discussion – Welcome to the Board Room

4:30 pm – 5:30 pm **Parallel Plenary Session**
Throwing a Lasso Around the "Orange Book"
Location: Nelson Wolff Exhibit Hall A, Level 1

Presented by the Society of Trauma Nurses
Moderator: Amanda Elikofer, MSN, BSN, RN, NE-BC
Speakers:
Jeff Young, MD – Understanding Structure and Function of Trauma Performance Improvement
Amy Koestner, RN, MSN – Understanding Implementation, Monitoring and Documenting the PI Process

THURSDAY, JANUARY 14, 2016

SCIENTIFIC SESSION III-A – Trauma
Presiding: Bryce RH Robinson, MD & Robert D. Winfield, MD
Location: Cibolo Canyon Ballroom 1-6, Level 2

8:00 am # 12 SUCTION EVACUATION OF HEMOTHORAX A PROSPECTIVE STUDY
Presenter: Stephanie Savage, MD, MS
Discussant: Ali Salim, MD

8:20 am #13 AGE IS JUST A NUMBER: OSTEOPENIA AND SARCOPENIA ARE BETTER PREDICTORS OF INJURY SEVERITY THAN CHRONOLOGIC AGEY
Presenter: Morgan Oskutis
Discussant: Bellal Joseph, MD

8:40 am #14 IMPROVING OUTCOMES OF INJURED GERIATRIC PATIENTS: SMALL STEPS, BIGGER PROBLEM
Presenter: Peter Hammer, MD
Discussant: Kevin Pei, MD

9:00 am	#15	THE PROFILE OF WOUNDING IN CIVILIAN ACTIVE SHOOTER FATALITIES Presenter: E. Reed Smith, MD Discussant: Matthew Martin, MD
9:20 am	#16	OUTCOMES OF LOWER EXTREMITY VASCULAR REPAIRS EXTENDING BELOW THE KNEE: A MULTICENTER RETROSPECTIVE REVIEW Presenter: Gerald Fortuna, Jr., MD Discussant: Scott Brakenridge, MD
9:40 am	#17	MILITARY INJURY SEVERITY SCORE: A BETTER PREDICTOR OF COMBAT-RELATED MORTALITY THAN INJURY SEVERITY SCORE Presenter: Kirby Gross, MD Discussant: Travis Polk, MD

SCIENTIFIC SESSION III-B – COX-TEMPLETON INJURY PREVENTION PAPER COMPETITION OF THE EAST FOUNDATION

Presiding: Alexander Eastman, MD, MPH & Jason Smith, MD, PhD

Location: Nelson Wolff Exhibit Hall A, Level 1

8:00 am	#18	TRAUMA IS AN INDEPENDENT FACTOR FOR BRIEF INTERVENTION SUCCESS Presenter: Peter Ehrlich, MD, MSc, H BSc Discussant: Tiffany Overton, MA, MPH
8:20 am	#19	HOME SAFE HOME: EVALUATION OF A CHILDHOOD HOME SAFETY PROGRAM Presenter: Tanya Charyk Stewart, BSc, MSc Discussant: Brian Brewer, MD
8:40 am	#20	CREATION OF THE FIRST HARTFORD CONSENSUS COMPLIANT SCHOOL IN THE UNITED STATES Presenter: Jordan Bohnen, MD, MBA Discussant: Michael F. Rotondo, MD
9:00 am	#21	EVERY 15 MINUTES: A HIGH SCHOOL INTERVENTION TO REDUCE ALCOHOL RELATED COLLISIONS Presenter: Paul Chestovich, MD Discussant: Daryhl Johnson, II, MD, MPH
9:20 am	#22	INJURY PREVENTION PROGRAMS AGAINST DISTRACTED DRIVING AMONG STUDENTS Presenter: Bellal Joseph, MD Discussant: Lisa Allee Barmark, MSW, LICSE
9:40 am	#23	A TARGETED HIGH SCHOOL SEAT BELT AWARENESS PROGRAM INCREASES SEAT BELT USAGE FOR ADOLESCENT DRIVERS Presenter: A. Britton Christmas, MD Discussant: Shannon Foster, MD

End of Cox-Templeton Injury Prevention Paper Competition of the EAST Foundation

10:00 am - 10:30 am	Break – Visit the Exhibits - Refreshments provided in the Exhibit Area Location: Cibolo Canyon Ballroom 7, Level 2
10:30 am – 11:30 am	Scott B. Frame, MD Memorial Lecture of the EAST Foundation Location: Cibolo Canyon Ballroom 1-6, Level 2 *The Makings of a Trauma Surgeon* Mark Malangoni, MD, FACS Associate Executive Director, American Board of Surgery
11:30 am – 12:30 pm	Lunch on your own

11:30 am-12:30 pm **Today's Topics 6-10 -** Ticket required. Additional registration fee applies.

Today's Topic 6 – *Presented by the EAST Online Education Section*
Quality Improvement: The Good, the Bad, and the Ugly
Moderators: Randeep Jawa, MD & Matthew Martin, MD
Speakers:
Nicholas Namias, MD – Never Events and Never Never Land: Are They Fairytales?
Elliott R. Haut, MD, PhD – Epic Failures on Quality Measures: The Seedy Underbelly of Public Reporting
Avery Nathens, MD – Developing Valid, Meaningful, and Useful Quality Metrics for the Future

Today's Topics 7 – *Presented by the Pediatric Trauma Society*
Management of Abdominal Solid Organ Injuries in Children: What We Complain About Behind Your Backs
Moderator: Martin Keller, MD
Speakers:
Martin Keller, MD – Identification and Work-Up of Children at Risk for Significant Abdominal Injury: Who, What, Where, When, and Why?
Kennith Sartorelli, MD – Non-Operative Management of Liver and Spleen Injuries in Children: Knowing When it Fails and What to Do
Adam Vogel, MD – Current and Future Status of Non-Operative Management of Liver and Spleen Injuries in Children: Pushing the Envelope

Today's Topics 8 – *Presented by the EAST Emergency General Surgery Section*
I Have a Consult for You…" The Acute Abdomen in the Non-Surgical ICU
Moderator: Daniel Dante Yeh, MD
Speakers:
Adam Fox, MD – Consult for: Elevated Lactate, Rule-Out Dead Bowel
Michael Cripps, MD – Consult for: Upper/Lower GI Bleeding
Paula Ferrada, MD – Consult for: C. Difficile Colitis

Today's Topics 9 – *Presented by the EAST Career Development Section*
Caring for the Elephant in the Room
Moderator: Jamie Coleman, MD
Speakers:
Sandy Strack Arabian, BS, CSTR, CAISS – The Prevalence of Burnout, Depression, and PTSD in Healthcare Providers: Current Studies
Heena Santry, MD – The Implications of Stress: Professional and Personal
Barbara K. Reid, PhD, M.Ed, MA, LMFT – Recognizing "I" am at the Center of Care: Interventions

Today's Topics 10 – *Presented by the Society of Trauma Nurses*
Initial Pharmacotherapy in the Trauma Bay
Moderator: Jonathan Messing, MSN, CCRN, ACNP-BC
Speaker:
Daniel Holena, MD

1:00 pm – 1:45 pm **EAST Annual Oriens Presentation**
Location: Cibolo Canyon Ballroom 1-6, Level 2

Supported by the EAST Foundation through an unrestricted grant from Polk Family Charitable Foundation
1:00 pm – 1:30 pm – Keynote Address - Team of Teams - Donald H. Jenkins, MD, FACS
1:30 pm-1:45 pm – Oriens Essay Presentations
Fellow Winner – Dylan R. Nieman, MD, PhD
Resident Winner – Samuel Wade Ross, MD, MPH

1:45 pm – 3:15 pm **Parallel Plenary Session - Multicenter Study Recruitment Proposals**
Location: Cibolo Canyon Ballroom 1-6, Level 2

Presented by the EAST Multicenter Trials Section
Moderator: Joseph J. DuBose, MD

1:45 pm – 3:15 pm **Parallel Plenary Session - Engage the Masters**
Location: Nelson Wolff Exhibit Hall A, Level 1

Presented by the EAST Career Development Section
Masters: Bryan A. Cotton, MD, MPH, Bruce A. Crookes, MD, Nicole A. Stassen, MD
Case Presentations:
A Knife in the Back; A Dilemma for the Surgeon – Lindsey E. Peters, MD
Bleeding Esophageal Varices Treated with Esophageal Exclusion & Splenopneumopexy – Mary Caroline Nally, MD
Biliary Pleural Fistula and Major Hepatic Necrosis from Penetrating Thoracoabdominal Trauma – Jigarkumar A. Patel, MD

3:15 pm – 5:00 pm **No Suit, No Problem: Fostering Relationships and Building Careers**
Location: Nelson Wolff Exhibit Hall B, Level 1

A special networking event for Residents and Fellows brought to you by the EAST Career Development Section.

5:00 pm – 6:00 pm **Scientific Posters Session**
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Group I Poster Professors:
Luis J. Garcia, MD & Martin D. Zielinski, MD

#1 FACTORS PREDICTING FAILURE OF NONOPERATIVE MANAGEMENT IN COMPLICATED APPENDICITIS: AN ANALYSIS OF THE NATIONWIDE INPATIENT SAMPLE
Presenter: Britt J. Sandler, BS, MHS

#2 THE IMPACT OF DIABETES MELLITUS ON EMERGENCY GENERAL SURGERY BURDEN AND OUTCOMES IN THE UNITED STATES: 2001-2010
Presenter: Jessica Crystal

#3 DOES FACILITY LOCATION INFLUENCE OUTCOMES? COMPARISON OF RURAL AND URBAN PATIENTS
Presenter: Muhammad Ali Chaudhary, MBBS

#4 PREDICTORS OF MORTALITY IN PATIENTS REQUIRING SURGERY FOR PERFORATED PEPTIC ULCER DISEASE
Presenter: Brittany Fenner

#5 HIV-INFECTED PATIENTS HAVE POORER OUTCOMES FOLLOWING EMERGENCY GENERAL SURGERY: A STUDY OF THE NATIONWIDE INPATIENT SAMPLE
Presenter: Britt J. Sandler, BS, MHS

#6 ACUTE CARE CHOLECYSTECTOMY VS ELECTIVE CHOLECYSTECTOMY: SIMILAR.....BUT DIFFERENT
Presenter: Greg Hambright

Group II Poster Professors:
Randeep S. Jawa, MD & Carlos Rodriguez, DO, MBA

#7 MULTIDISCIPLINARY COLLABORATION DECREASES THE INCIDENCE OF CATHETER ASSOCIATED URINARY TRACT INFECTION (CAUTI) IN THE SURGICAL AND TRAUMA ICU
Presenter: Mamoona Arif Rahu, PhD, RN, CCRN

#8 THE PROBLEM OF PRECEDENCE: EXAMINING THE COMPOSITION OF THE FAILURE TO RESCUE METRIC IN TRAUMA
Presenter: Daniel N. Holena, MD

#9 APPLICATION OF FORCED AIR WARMING SIGNIFICANTLY REDUCES HYPOTHERMIA TIME IN TRAUMATICALLY INJURED PATIENTS
Presenter: Frank Zhao, MD

#10 THE IMPACT OF MINOR TRAUMA ON PREGNANCY AND NEONATAL OUTCOMES
Presenter: Meike Schuster, DO

#11 UTILITY OF PROPHYLACTIC ANTIBIOTICS FOR NON-OPERATIVE FACIAL FRACTURES
Presenter: Jeffrey Wild, MD

#12 ASSOCIATION BETWEEN BODY MASS INDEX AND PATIENT OUTCOMES 3 MONTHS POST TRAUMATIC INJURY
Presenter: Ann Marie Warren

Group III Poster Professors:
Jamie Jones Coleman, MD & Samir Fakhry, MD

#13 OVERSEAS ORGAN DONATION DURING WARTIME OPERATIONS: BENCHMARKING MILITARY PERFORMANCE AGAINST CIVILIAN PRACTICE
Presenter: John Oh, MD

#14 CURRENT AND DESIRED PRACTICE PATTERNS OF TRAUMA AND ACUTE CARE SURGEONS (T/ACS)
Presenter: Nathan Droz

#15 LOST IN TRANSLATION: FOCUSED DOCUMENTATION IMPROVEMENT BENEFITS TRAUMA SURGEONS
Presenter: Nicole Fox, MD, MPH

#16 TRAUMA SURGEONS SAVE LIVES - SCRIBES SAVE TRAUMA SURGEONS!
Presenter: Joseph F. Golob, MD

#17 COMFORT WITH UNCERTAINTY IS INHERENT TO ACS SURGEONS AND DOES NOT CHANGE WITH EXPERIENCE: EAST MEMBERS SURVEY RESULTS
Presenter: Bishwajit Bhattacharya, MD

#18 THE ANATOMY OF NURSING INTERRUPTIONS IN A SURGICAL INTENSIVE CARE UNIT AT A TRAUMA CENTER
Presenter: Robert A. Myers, MSE

#19 REPLACEMENT OF A SWINE MODEL: DESIGN OF A COST EFFECTIVE HEMODYNAMICALLY ADJUSTABLE MODEL (HAM) FOR REBOA SIMULATION
Presenter: Benjamin A. Keller, MD

#20 FACTORS ASSOCIATED WITH THE DECISION TO WITHDRAW CARE IN CRITICALLY INJURED PATIENTS ADMITTED TO THE ICU
Presenter: Fadi M. Balla, MD

Group IV Poster Professors:
A. Britton Christmas, MD & Tanya L. Zakrison, MD, MPH

#21 LATE MIDDLE AGE (55-65): AT THE INTERSECTION OF COMORBIDITY AND HIGH-RISK ACTIVITY
Presenter: Stephen C. Gale, MD

#22 RECURRENT VIOLENT INJURY
Presenter: Elinore J. Kaufman, MD

#23 PAIN IS AN INACCURATE PREDICTOR OF TOURNIQUET EFFICACY
Presenter: Jonathan D. Alterie

#24 GEOSPATIAL ANALYSIS OF VIOLENT CRIME AND TRAUMA SYSTEM UTILIZATION
Presenter: Caleb J. Mentzer, DO

#25 GEOGRAPHIC DISTRIBUTION OF TRAUMA SERVICES IN THE UNITED STATES: DOES AVAILABILITY CORRESPOND TO PATIENT NEED?
Presenter: Arturo J. Rios Diaz, MD

#26 THE IMPACT OF A STANDARDIZED STATEWIDE PRE-HOSPITAL TRIAGE SYSTEM ON TRAUMA TRANSFERS
Presenter: Peter A. Zmijewski, MD

Group V Poster Professors:
Matthew Martin, MD & Jose Pascual Lopez, MD, PhD

#27 END-TIDAL CO2 ON ADMISSION PREDICTS THE NEED FOR MASSIVE TRANSFUSION AS DEFINED BY CRITICAL ADMINISTRATION THRESHOLD: A PILOT STUDY
Presenter: Edward Chao, MD

#28 VACUOLATED POLYMORPHONUCLEAR NEUTROPHILS ON A STANDARD PERIPHERAL BLOOD SMEAR DIRECTLY CORRELATE WITH LACTATE LEVELS IN HEMORRHAGIC SHOCK TRAUMA PATIENTS: A CASE CONTROL
Presenter: Joao B. Rezende-Neto, MD, PhD

#29 PELVIC FREE FLUID ON CT OF THE ABDOMEN AND PELVIS:STILL A SIGNIFICANT FINDING?
Presenter: Amy Hildreth, MD

#30 SELF-EXPANDING FOAM FOR RESCUE FROM ABDOMINAL EXSANGUINATION: A QUANTITATIVE HUMAN FACTORS ASSESSMENT ON CIVILIAN AND MILITARY END-USERS. CAN WE TEACH OTHERS?
Presenter: Upma Sharma, PhD

#31 MESENCHYMAL STEM CELLS LOCATE AND DIFFERENTIATE TO THE TRAUMA SITE IN A BLUNT RAT LIVER TRAUMA MODEL
Presenter: Mostafa Alhabboubi, MBBS

#32 THE RED BLOOD CELL STORAGE LESION IS PH DEPENDENT
Presenter: Alex L. Change, MD

Group VI Poster Professors:
Mayur B. Patel, MD, MPH & Melissa Warta, MD

#33 DOES ARGININE VASOPRESSIN EXACERBATE CEREBRAL EDEMA AFTER TRAUMATIC BRAIN INJURY?
Presenter: Jonathan P. Meizoso, MD

#34 TIMING OF VENOUS THROMBOEMBOLISM PROPHYLAXIS IN SEVERE TRAUMATIC BRAIN INJURY: A PROPENSITY-MATCHED COHORT STUDY
Presenter: James P. Byrne, MD

#35 EARLY ANTITHROMBOTIC THERAPY IS SAFE AND EFFECTIVE IN BLUNT CEREBROVASCULAR INJURY WITH SOLID ORGAN INJURY AND TRAUMATIC BRAIN INJURY
Presenter: Charles P. Shahan, MD

#36 POSTERIOR PARAMEDIAN SUBRHOMBOIDAL ANALGESIA VS. THORACIC EPIDURAL ANALGESIA FOR MULTIPLE RIB FRACTURES
Presenter: Casey L. Shelley, DO, BS

#37 NOVEL MODIFIED VERESS NEEDLE IS SUPERIOR TO ANGIOCATHETER FOR DECOMPRESSION OF TENSION PNEUMOTHORAX IN A YORKSHIRE SWINE MODEL
Presenter: Laura Fluke, DO

#38 USE OF HIGH FLOW NASAL CANNULA IN ADULT TRAUMA PATIENTS
Presenter: Meghan Halub, MD

#39 RIB FRACTURE FIXATION IN THE 65 YEAR OLD POPULATION: A PARADIGM SHIFT IN MANAGEMENT STRATEGY
Presenter: Michael T. Fitzgerald, MD

FRIDAY, JANUARY 15, 2016

7:00 am-7:55 am **Today's Topics 11-15 -** Ticket required. Additional registration fee applies.

Today's Topic 11 – *Presented by the EAST Annual Scientific Assembly Section*
Assessing for and Reversing Coagulopathy
Moderator: Babak Sarani, MD
Speakers:
Mitch Cohen, MD – Advantages and Disadvantages of Vesicoelastrography to Assess for Coagulopathy: How Do I Interpret The Tracings?
Babak Sarani, MD – How to Assess for Pharmacologic Platelet Inhibition and How to Reverse it
Martin Schreiber, MD – Advantages and Disadvantages of Tradition, Serum Based Measures of Coagulopathy

Today's Topics 12 – *Presented by the EAST Guidelines Section*
Beyond Methodology: Understanding and Implementing EAST Practice Management Guidelines from the 2015 Authors
Moderator: Bryce RH Robinson, MD, MS
Speakers:
Nicole Fox, MD – An Explanation of the "Evaluation and Management of Blunt Traumatic Aortic Injury" PMG
Mayur Patel, MD, MPH – An Explanation of the "Cervical Spine Collar Clearance in the Obtunded Adult Trauma Patient" PMG
Bryce RH Robinson, MD, MS – GRADE "Ultra-Basics" and Common Pitfalls of EAST PMGs

Today's Topics 13 – *Presented by the EAST Emergency General Surgery Section*
The Bigger They Are…Surgical Emergencies and "Damage Control Bariatrics" for the Acute Care Surgeon
Moderator: Martin Zielinski, MD
Speakers:
Matthew Martin, MD - The Operative and Non-operative Techniques for the Management of Early and Late Post Bariatric Surgical Complications
Andrea Pakula, MD, MPH - The Evaluation and Diagnosis of Surgical Emergencies in the Post Bariatric Patient

Today's Topics 14 – *Presented by the EAST Multicenter Trials Section*
Optimizing Success for the Young Researcher: Tips for Planning, Organizing, Funding, and Executing Your Multicenter Trial
Moderator: Ben L. Zarzaur, MD, MPH
Speakers:
Joseph DuBose, MD – Site Recruitment and Management
Raminder Nirula, MD, MPH – Funding, Authorship, and Publication
Jose Pascual Lopez, MD, PhD – Human Subjects Considerations
Tanya L. Zakrison, MD, MPH – Idea Generation and Protocol Development
Ben L. Zarzaur, MD, MPH – Database Design and Maintenance

Today's Topic 15 – *Presented by the Society of Trauma Nurses*
Geriatric Trauma Service (GTS): Practices, Pitfalls, and Outcomes
Moderator: Julie Nash, MSN, RN
Speaker: Douglas J.E. Schuerer, MD, FACS

SCIENTIFIC SESSION IV-A – Coagulation
Presiding: Marie L. Crandall, MD, MPH & Carlos Rodriguez, DO, MBA
Location: Cibolo Canyon Ballroom 1-6, Level 2

8:00 am	#24	TRAUMA PATIENTS ON NEW ORAL ANTICOAGULATION AGENTS HAVE LOWER MORTALITY THAN THOSE ON WARFARIN Presenter: Adrian Maung, MD Discussant: Uzer Khan, MD, MBBS
8:20 am	#25	INFLUENCES OF LIMITED RESUSCITATION WITH PLASMA OR PLASMA PROTEIN SOLUTIONS ON HEMOSTASIS AND SURVIVAL OF RABBITS WITH NON-COMPRESSIBLE HEMORRHAGE Presenter: Bijan Kheirabadi, PhD Discussant: Michael Cripps, MD
8:40 am	#26	SUBCUTANEOUS ADIPOSE TISSUE DRIVES POST INJURY HYPERCOAGULABILITY Presenter: Robert Winfield, MD Discussant: Rachael Callcut, MD, MSPH
9:00 am	#27	TRAUMA-INDUCED COAGULOPATHY IN A CRITICALLY INJURED PEDIATRIC POPULATION - DEFINITION, CONTRIBUTING FACTORS, AND IMPACT ON OUTCOMES Presenter: Christine Leeper, MD Discussant: Robert Letton, Jr., MD
9:20 am	#28	HOW LONG SHOULD WE FEAR? LONG-TERM RISK OF VENOUS THROMBOEMBOLISM IN PATIENTS WITH TRAUMATIC BRAIN INJURY Presenter: Olubode Olufajo, MD, MPH Discussant: Sherry Sixta, MD
9:40 am	#29	UNIVERSAL WHOLE BLOOD FOR TRAUMATIC HEMORRHAGIC SHOCK: A PILOT STUDY TO DETERMINE SAFETY Presenter: Alan Murdock, MD Discussant: Kyle Remick, MD

SCIENTIFIC SESSION IV-B – Emergency General Surgery
Presiding: Mayur B. Patel, MD, MPH & Cynthia Talley, MD
Location: Nelson Wolff Exhibit Hall A, Level 1

8:00 am	#30	SURGICAL RESCUE: THE NEXT PILLAR OF ACUTE CARE SURGERY Presenter: Matthew Kutcher, MD Discussant: Joshua Hazelton, DO
8:20 am	#31	EMERGENCY GENERAL SURGERY SPECIFIC FRAILTY INDEX: A VALIDATION STUDY Presenter: Tahereh Orouji Jokar Discussant: Eric Bradburn, DO, MS
8:40 am	#32	GO FOR THE JUGULAR: ASSESSING VOLUME RESPONSIVENESS IN CRITICALLY ILL SURGICAL PATIENTS Presenter: Sarah Murthi, MD Discussant: Brian Williams, MD
9:00 am	#33	ACUTE CARE SURGERY AND EMERGENCY GENERAL SURGERY: ADDITION BY SUBTRACTION Presenter: Brandon Bruns, MD Discussant: Stephen Barnes, MD
9:20 am	#34	THE TRANSFORMING POWER OF EARLY CAREER ACUTE CARE SURGERY RESEARCH SCHOLARSHIPS ON ACADEMIC PRODUCTIVITY Presenter: Ben Zarzaur, MD, MPH Discussant: Martin Zielinski, MD
9:40 am	#35	STRESS AMONG SURGICAL ATTENDINGS AND TRAINEES: A QUANTITATIVE ASSESSMENT DURING TRAUMA ACTIVATION AND EMERGENCY SURGERIES Presenter: Bellal Joseph, MD Discussant: Natasha Keric, MD

10:00 am - 11:00 am **Presidential Address**
Location: Cibolo Canyon Ballroom 1-6, Level 2

Resilience…
Stanley J. Kurek, Jr., DO, FACS

11:00 am-11:15 am **Gavel Exchange**
Location: Cibolo Canyon Ballroom 1-6, Level 2

11:15 am-12:00 pm **EAST & EAST Foundation Awards Ceremony**
Location: Cibolo Canyon Ballroom 1-6, Level 2

- *Raymond H. Alexander, MD Resident Paper Competition of the EAST Foundation*
- *Best Manuscript Award*
- *EAST Oriens Award*
- *John P. Pryor, MD Distinguished Service in Military Casualty Care Award*
- *Cox-Templeton Injury Prevention Paper Award of the EAST Foundation*
- *John M. Templeton, Jr., MD Injury Prevention Research Scholarship of the EAST Foundation*
- *Trauma Research Scholarship of the EAST Foundation*
- *2015 Health Policy and Management Scholarship Recipient of the EAST Foundation*
- *2016 Leadership Development Workshop Scholars Recognition*
- *2016 Society of Trauma Nurses/EAST Foundation Nurse Fellow Recipient*

12:00 pm – 2:00 pm **EAST Practice Management Guidelines Plenary Session**
Location: Cibolo Canyon Ballroom 1-6, Level 2

Presented by the EAST Guidelines Section
Moderator: Bryce R.H. Robinson, MD, FACS
PMGs scheduled to be presented (*subject to change*):

- Large Bowel Obstruction – Paula Ferrada, MD
- Venous Thromboembolism Prophylaxis in Traumatic Brain Injury – Rajesh Gandhi, MD, PhD
- Anticoagulation and Antiplatelet Reversal in Traumatic Intracranial Hemorrhage – Urmil Pandya, MD
- Treatment of Pancreatic Trauma - Vanessa Ho, MD, MPH
- Monitoring Modalities, Assessment of Volume Status, and Endpoints of Resuscitation – David Plurad, MD
- Beta Blockers After Traumatic Brain Injury – Mayur Patel, MD, MPH
- Diaphragm Injury – Amy McDonald, MD
- Prevention of Sports Concussions – Toby Enniss, MD
- Appendicitis – Mayur Narayan, MD, MPH, MBA
- Damage Control Resuscitation/Anti-Fibrinolytic Practice Management – Jeremy Cannon, MD, SM
- Prevention of ATV Injury – D'Andrea Joseph, MD
- VTE Prophylaxis for Pediatric Trauma – E. Vincent S. Faustino, MD, MHS

2:00 pm Scientific Program Adjourns

ABSTRACTS

Scientific Session I - Raymond H. Alexander, MD Resident Paper Competition
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #1
January 13, 2016
8:00 am

IN BLEEDING PATIENTS UNDERGOING DAMAGE CONTROL LAPAROTOMY, HYPERTONIC SALINE IMPROVES PRIMARY FASCIAL CLOSURE AT THE FIRST TAKE BACK

Lindley E Folkerson, MD, Ryan A. Lawless, MD*, Joseph D Love, DO, FACS*,
Michelle McNutt, MD*, Laura J. Moore, MD*, Bryan A. Cotton, MD, MPH*,
Charles E. Wade, PhD, John A. Harvin, MD*
Center for Translational Injury Research, Department of Surgery, University of Texas-Houston

Presenter: Lindley E. Folkerson, MD

Discussant: Margaret Lauerman, MD, University of Maryland

Objectives: Following damage control laparotomy (DCL) for trauma, primary fascial closure (PFC) at the first take back is associated with reduced complications. The use of hypertonic saline (HTS) after DCL has been shown to improve PFC rates. A limitation of prior studies was the inclusion of moderately injured patients likely to achieve PFC regardless of fluid choice. The purpose of the current study was to evaluate the impact of post-operative HTS on PFC rates among bleeding trauma patients undergoing DCL.

Methods: DCL patients who met Critical Administration Threshold (CAT) blood transfusion criteria (≥3 units RBCs/hour) were analyzed. Patients were dichotomized into those who received standard maintenance fluids, STD (admitted 01/2010-06/2011) and those who received HTS (07/2013-12/2014). Primary outcome was PFC at the first take back. Continuous variables expressed as medians with inter-quartile range.

Results: 95 patients met inclusion (54 STD, 41 HTS). There were no differences in demographics or injury severity score, however, patients in the HTS group were more hypotensive (88 mmHg, 79 and 100 vs 91 mmHg, 77 and 118; p=0.02), had a greater base deficit (10 mmol/L, 6 and 13 vs 7 mmol/L, 3 and 9, p=0.01) on arrival, and received more OR RBCs (9 U, 6 and 15 vs 7 U, 4 and 10; p=0.07). They also had a significantly lower fluid balance in the first 24 hours (2.5 L, 0.6 and 7.0 vs 6.1 L, 3.7 and 10.5; p<0.001) and 48 hours (3.8 L, 1.3 and 6.7 vs. 9.0 L, 5.3 and 12.0; p<0.001). After adjusting for injury severity and resuscitation volumes, the use of HTS was found to be an independent predictor of PFC at the first take back (OR 3.82, 95% CI 1.02-14.31, p=0.047).

Conclusions: In a group of seriously injured, bleeding trauma patients undergoing DCL, the use of HTS was associated with a lower fluid balance and higher rate of PFC at the first take back.

Notes

Scientific Session I - Raymond H. Alexander, MD Resident Paper Competition
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #2
January 13, 2016
8:20 am

BRAIN HYPOXIA IS EXACERBATED IN HYPOBARIA DURING AEROMEDICAL EVACUATION IN SWINE WITH TBI

Steve Chun, MD, Ashraful Haque, Brittany Hazzard, Saha Biswajit, Martin Harssema, Charles Auker, Debra L. Malone, MD*, Richard McCarron, Anke H Scultetus, MD
Naval Medical Research Center

Presenter: Steve Chun, MD

Discussant: Joel Elterman, MD, CSTARS Cincinnati, University of Cincinnati Medical Center

Objectives: The rapid evacuation of combat casualties to definitive care is current standard practice. On occasion, civilian aero-medical transfers happen as well. Not much is known about the effects of long range aero-medical evacuation in hypobaric environments on patients. Casualties are "stabilized along the continuum of care," rather than "stable" prior to evacuation thus being more vulnerable than healthy passengers to the physiological challenges of altitude. This study investigated the effects of hypobaria during aero-medical evacuation on systemic and neurophysiology in a swine model of TBI.

Methods: Anesthetized swine had fluid percussion TBI and injury-specific care over 2 hours, followed by a 4 hour aeromedical evacuation simulated in a hypobaric chamber with atmospheric pressure equivalent to an altitude of 8000 ft. (HYPO, n=6).Control animals were kept at normobaria (NORMO, n=6).At 6 hours, animals were euthanized. Systemic and neurophysiology [brain tissue oxygenation ($p_{br}O_2$)] data were collected. Blood was analyzed for arterial gases and electrolytes. Repeated-measures ANOVA with $P<0.05$ was considered significant.

Results: Baseline parameters were similar in both groups. During flight, mean arterial pressure (MAP) in HYPO animals decreased ($p<0.104$) while intracranial pressure (ICP) increased ($p< 0.008$) compared to NORMO. This resulted in significantly lower cerebral perfusion pressure (CPP) in HYPO animals ($p< 0.0001$). $p_{br}O_2$ was also reduced in HYPO animals.

Conclusions: In this swine model of TBI prolonged hypobaria resulted in a significant elevation of ICP and reduction in CPP, and in reduced brain tissue oxygenation compared to normobaric conditions. These findings may suggest that hypobaric conditions exacerbate hypoxia in swine already under neurophysiological compromise due to TBI. Further studies are indicated to simulate other en route care scenarios and possibly re-evaluate casualty evacuation guidelines.

Notes

Scientific Session I - Raymond H. Alexander, MD Resident Paper Competition
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #3
January 13, 2016
8:40 am

PERCUTANEOUSLY DRAINED INTRA-ABDOMINAL INFECTIONS DO NOT REQUIRE LONGER DURATION OF ANTIMICROBIAL THERAPY

Rishi Rattan, MD*, Casey J Allen, Robert Sawyer, MD*, Nicholas Namias, MD*
University of Miami Miller School of Medicine

Presenter: Rishi Rattan, MD

Discussant: Jennifer Knight, MD, West Virginia University

Objectives: The length of antimicrobial therapy in complicated intra-abdominal infections (CIAI) is controversial. A recent prospective, multicenter, randomized controlled trial found that 4 days of antimicrobial therapy after source control of CIAI resulted in similar outcomes when compared to longer duration. We sought to examine whether outcomes remain similar in the subgroup of patients who received percutaneous drainage for source control of CIAI.

Methods: Using the STOP-IT database, patients age >16 years with a CIAI and either temperature >38º C, white blood cell count >11,000 cells/mm³, or peritonitis-induced gastrointestinal dysfunction who received percutaneous drainage were analyzed. Patients were randomized to receive antibiotics until 2 days after the resolution of fever, leukocytosis, and ileus, with a maximum of 10 days of therapy or receive a fixed course of antibiotics for 4±1 calendar days. Outcomes included recurrent intra-abdominal infection, time to recurrent infection, Clostridium difficile infection, hospital days, and mortality.

Results: Of 129 patients identified, 72 received a 4-day course of antibiotics and 57 patients received a longer course. Baseline characteristics, including demographics, comorbidities, and severity of illness were similar. When comparing outcomes of the 4-day group to the longer group, rates of recurrent intra-abdominal infection (9.7 vs 10.5%, p=1.00), Clostridium difficile infection (0 vs 1.8%, p=0.442), and hospital days (4.0 [2.0-7.5] vs 4.0 [3.0-8.0], p=0.91) were similar. Time to recurrent infection was shorter in the 4-day group (12.7±6.2 vs 21.3±4.2 days, p=0.015). There was no mortality.

Conclusions: In this analysis of a prospective, multicenter, randomized trial, there was no difference in outcome between a shorter and longer duration of antimicrobial therapy in those with percutaneously drained source control of a CIAI.

Notes

Scientific Session I - Raymond H. Alexander, MD Resident Paper Competition
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #4
January 13, 2016
9:00 am

N-ACETYL CYSTEINE RENDERS AIRWAY BARRIER AT RISK FOR BACTERIAL PASSAGE AND SUBSEQUENT INFECTION.

Jonathan Friedman, MD, Lawrence N. Diebel, MD*, David Liberati, MS
Wayne State University

Presenter: Jonathan Friedman, MD

Discussant: Stephen Fann, MD, Medical University of South Carolina

Objectives: The use of inhaled aerosols in mechanically ventilated patients is common practice in the ICU. However, a recent trial using a combination of nebulized heparin, albuterol, and the mucolytic/antioxidant N-acetylcysteine (NAC) demonstrated an increased incidence of pneumonia. Recent work has demonstrated the importance of the physiologic mucus barrier in the respiratory airway. We hypothesize that NAC will alter mucus properties, cytokine response to bacteria, and bacterial transcytosis in vitro.

Methods: Calu-3, a human bronchial epithelial cell monolayer, was grown in a 2-chamber cell culture system. Epithelial mucin and free O-linked oligosaccharide (OSC) content of Calu-3 cultures pretreated with NAC (0.3µg/mL for 15 mins), albuterol (10^{-6} M for 24 hrs), or control were quantified using ELISA. In a separate experiment, *Klebsiella pneumonia* (10^5 CFU/mL) was added to the apical chamber of Calu-3 monolayers pretreated with NAC, albuterol, or control. Basal cytokine response and bacterial transcytosis (at 60, 120, 240 mins) were measured.

Results: Epithelial mucin content and free OSC content of Calu-3 cultures were decreased with 15 minutes of NAC administration. In response to innoculation with K. pneumonia, Calu-3 cultures had an attenuated basal IL-6 and TNF response when pretreated with NAC. Bacterial translocation of K. pneumonia was increased in NAC pretreated cultures at 60, 120, and 240 minutes.

Conclusions: NAC adversely affected respiratory mucus chemical properties and epithelial barrier integrity. Short-term administration of NAC attenuated apical mucin content, free OSC, cytokine response to bacterial presence, and increased the translocation of bacteria across the epithelial surface. Our data supports that “routine” use of NAC in mechanically ventilated patients, including those with smoke inhalation injury should be avoided.

	Mucin content (μg)	OSC (ng/ml)
Calu-3 control	4.2 ± 0.4	3.2 ± 0.6
Calu-3 + Albuterol (24hrs.) 10^{-6}M	4.8 ± 0.6	3.8 ± 0.5
Calu-3 + NAC (0.3μg/ml)	1.6 ± 0.2*	1.2 ± 0.4*

*P<0.001 vs. all other groups.

	Basal cytokine (pg/ml)		Bacterial translocation (log_{10}CFU/ml *Kleb. pneumo.*)		
	TNF	IL-6	60 min.	120 min.	240 min.
Calu-3 control	15.2 ± 1.2	9.2 ± 0.8	-	-	-
Calu-3 + *K. pneumo.*	27.3 ± 0.9*	15.7 ± 0.5*	1.6 ± 0.10	1.9 ± 0.10	2.3 ± 0.20
Calu-3 + Albuterol 10^{-6}M+ *K. pneumo.*	25.9 ± 1.5*	14.4 ± 1.1*	1.7 ± 0.06	2.0 ± 0.10	2.6 ± 0.20
Calu-3 + NAC (0.3μg/ml) + *K. pneumo.*	19.1 ± 2.2	11.9 ± 1.4	2.5 ± 0.08*	2.9 ± 0.10*	3.7 ± 0.3*

Notes

Scientific Session I - Raymond H. Alexander, MD Resident Paper Competition
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #5
January 13, 2016
9:20 am

BLOOD TRANSFUSION: IN THE AIR TONIGHT?

Benjamin T. Miller, MD, Liping Du, Michael Krzyzaniak, MD*,
Oliver L. Gunter, Jr., MD, FACS*, Timothy C. Nunez, MD, FACS*
Vanderbilt University Medical Center

Presenter: Benjamin T. Miller, MD

Discussant: Brian Kim, MD, Mayo Clinic

Objectives: The use of prehospital blood transfusion (PBT) in air medical transport has become widespread. However, the effect of PBT remains unknown. The aim of this study was to examine the impact of PBT on 24-hour and overall in-hospital mortality.

Methods: This is a retrospective cohort study of all trauma patients carried by air medical transport from the scene to a Level One Trauma Center from 2007 to 2013. We excluded patients who died on the helipad or in the emergency department. Primary outcomes measured were 24-hour and overall in-hospital mortality. Multivariable logistic regressions using all available patient data or the propensity score (for receiving PBT) matched patient data were performed to study the effect of PBT on these outcomes.

Results: Of the 5581 patients included in the study, 231 (4%) received PBT. Multivariable regression analyses did not show evidence of PBT effect on 24-hour mortality (odds ratio [OR] 1.22; 95% confidence interval [CI] 0.61-2.44), nor on overall mortality (OR 1.20; 95% CI 0.55-1.79). Additionally, using 1:1 propensity score matched data, the analysis did not show evidence of PBT effect on 24-hour mortality (OR 1.04; 95% CI 0.54-1.98), nor on overall mortality (OR 1.05; 95% CI 0.56-1.96). Factors associated with increased 24-hour mortality were advanced age, penetrating injury, increased blood transfusion requirement in the first 24 hours, and decreased Glasgow Coma Scale score ($p < 0.05$). These factors were also associated with overall mortality, in addition to increased Injury Severity Score ($p < 0.05$).

Conclusions: This is the largest study to date of trauma patients who received PBT and were transported from the scene by air medical transport. Our results show no effect of PBT on 24-hour and overall in-hospital mortality. Previous studies also suggest no benefit of PBT, which is counterintuitive to damage control resuscitation. Prospective data on PBT is needed to assess risk, cost, and benefit.

Table 1: The effects of the studied covariates on 24-hour in-hospital mortality that are estimated from the multivariable logistic regression using the propensity score matched data and considering the match.

	Comparing groups	Effect Odds Ratio	Lower 95% CI	Upper 95% CI	P value
Age	60 years vs. 40 years	2.22	1.48	3.36	<0.001
ISS	high-low=21	1.38	0.89	2.14	0.14
HCT	high-low=9	1.06	0.68	1.66	0.79
ED pulse	140 vs. 100	1.44	0.59	3.51	0.58
ED SBP	150 vs. 100	0.99	0.44	2.26	0.98
24-hour blood	high-low=4	1.32	1.17	1.49	<0.001
Travel duration	high-low=21minutes	0.78	0.50	1.21	0.27
Sex	Female vs. Male	1.33	0.62	2.84	0.46
Race	Others vs. white	0.48	0.07	3.31	0.58
	Black vs. white	0.58	0.15	2.27	
Penetrating	Yes vs. no	3.25	1.50	7.03	0.003
PBT	Yes vs. no	1.04	0.54	1.98	0.91
ED GCS	ED GCS 3 vs. 14-15	5.30	1.98	14.16	0.004
	ED GCS 4-13 vs. 14-15	2.51	0.41	15.23	

ISS: Injury Severity Score, HCT: hematocrit, ED: emergency department, PBT: pre-hospital blood transfusion, GCS: Glasgow Coma Scale. Note: One hundred and ninety-five patients who had no PBT were matched with 195 patients who received PBT using the nearest neighbor matching method and propensity score obtained from a logistic regression model on PBT use.

Table 2: The effects of the studied covariates on overall in-hospital mortality that are estimated from the multivariable logistic regression using the propensity score matched data and considering the match.

	Comparing groups	Effect Odds Ratio	Lower 95% CI	Upper 95% CI	P value
Age	60 years vs. 40 years	2.69	1.78	4.07	<0.001
ISS	high-low=21	2.27	1.46	3.53	<0.001
HCT	high-low=9	1.06	0.73	1.56	0.75
ED pulse	140 vs. 100	1.43	0.66	3.10	0.41
ED SBP	150 vs. 100	1.40	0.73	2.71	0.24
24-hour blood	high-low=4	1.22	1.08	1.37	<0.001
Travel duration	high-low=21minutes	1.03	0.77	1.38	0.83
Sex	Female vs. Male	1.22	0.63	2.35	0.56
Race	Others vs. white	0.25	0.03	1.79	0.22
	Black vs. white	0.47	0.13	1.62	
Penetrating	Yes vs. no	2.93	1.44	5.95	0.003
PBT	Yes vs. no	1.05	0.56	1.96	0.88
ED GCS	ED GCS 3 vs. 14-15	4.49	2.00	10.08	0.001
	ED GCS 4-13 vs. 14-15	2.03	0.37	11.05	

ISS: Injury Severity Score, HCT: hematocrit, ED: emergency department, PBT: pre-hospital blood transfusion, GCS: Glasgow Coma Scale. Note: One hundred and ninety-five patients who had no PBT were matched with 195 patients who received PBT using the nearest neighbor matching method and propensity score obtained from a logistic regression model on PBT use.

Notes

Scientific Session I - Raymond H. Alexander, MD Resident Paper Competition
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #6
January 13, 2016
10:00 am

THERE'S AN APP FOR THAT: A HANDHELD SMARTPHONE-BASED INFRARED IMAGING DEVICE TO ASSESS ADEQUACY AND LEVEL OF AORTIC OCCLUSION

Kyle K. Sokol, MD, George Black, Matthew Eckert, Matthew J. Martin, MD*
Madigan Army Medical Center

Presenter: Kyle K. Sokol, MD

Discussant: Khanjan Nagarsheth, MD, Rutgers University-Robert Wood Johnson Medical School

Objectives: Technological advances have made thermal imaging an appealing non-invasive point-of-care imaging adjunct in the trauma setting. We sought to assess whether a smartphone-based infrared imaging device (SBIR) could determine presence and level of aortic occlusion in a swine model. We hypothesized that various levels of aortic occlusion would transmit significantly different heat signatures at various anatomical points.

Methods: This study was performed using a FLIR One (Wilsonville, OR) mobile phone infrared imaging device. Six swine underwent sequential zone 1 (Z1) aortic cross clamping as well as zone 3 (Z3) aortic balloon occlusion (REBOA). SBIR readings were taken at 5 anatomic points (axilla [A], subcostal [S], umbilical [U], inguinal [I], medial malleolar [M]) and used to determine significant ($p \leq 0.05$) thermal trends 5-10 min after Z1 and Z3 occlusion. SBIR images were then reviewed for obvious qualitative differences during various levels of occlusion.

Results: Temperatures were similar among A,S,U,I,M points prior to and after aortic occlusions. Among the anatomical 2-point ratios evaluated, A/M and S/M ratios were the best predictors of aortic occlusion, whether at Z1 (8.2°F, $p<0.01$; 10.9°F, $p<0.01$) or at Z3 (7.3°F, $p<0.01$; 8.4ºF, $p<0.01$). The best predictor of Z1 vs Z3 occlusion was the S/I ratio (5.2°F, $p<0.05$ vs 3.4ºF, $p=0.27$)(Fig. 1). SBIR generated qualitatively different thermal images among occlusion groups (Fig. 2).

Conclusions: SBIR detected significant thermal trends during Z1 and Z3 occlusion by using an anatomical two point thermal ratio and easily recognized qualitative differences between control and occlusion images that would allow immediate determination of adequate balloon occlusion of the aorta. Portable SBIR represents an inexpensive and accurate tool for assessing perfusion, adequate REBOA placement, and even the aortic level of occlusion.

Occlusion	RATIO	Temp Diff (μ_Z-μ_{CON})	% Temp Change (μ_{Zx}/μ_{Zy}x100)	P-value
Zone 1	A/M	8.16°F	11.9%	0.002
Zone 1	S/I	5.23°F	4.4%	0.043
Zone 1	S/M	10.92°F	10.8%	0.001
Zone 1	U/M	11.26°F	10.8%	0.003
Zone 1	I/M	5.58°F	6.8%	0.002
Zone 3	A/M	7.33°F	11.1%	0.004
Zone 3	S/M	8.37°F	8.3%	0.006
Zone 3	I/M	4.76°F	5.9%	0.006

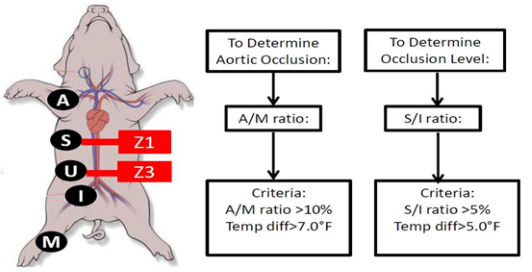
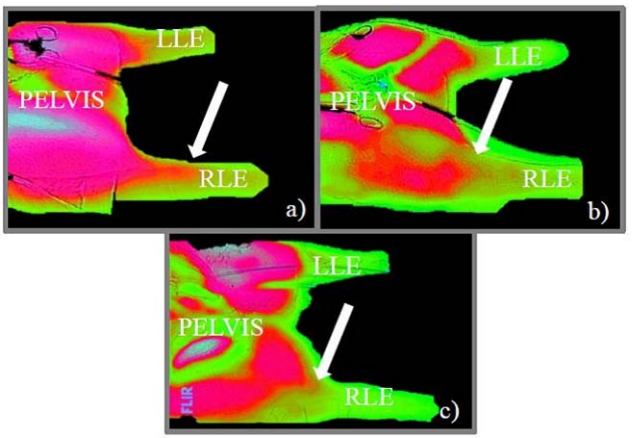


Figure 1. Anatomical location and significant five point thermal ratio patterns during zone I vs zone III occlusion (A=axillary, S=subcostal, U=umbilical, I=inguinal, M=medial malleolar, Z1=zone 1 aortic occlusion, Z3=zone 3 aortic occlusion, μ_Z=mean temperature at specified zone of occlusion, μ_{CON}=temperature change prior to specified aortic occlusion)



Smartphone-based infrared (SBIR) imaging of the lower torso and extremities without aortic occlusion (a), after zone 1 occlusion (b), and after zone 3 occlusion (c). Red/blue color indicates hotter and green color indicates cooler heat signatures. White arrows indicate substantial qualitative changes in thermal signature (LLE=left lower extremity, RLE=right lower extremity).

Notes

Scientific Session I - Raymond H. Alexander, MD Resident Paper Competition
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #7
January 13, 2016
10:20 am

PUSH OVER PULL: MANAGING THE SURGE IN DEMAND FOR BLOOD FOLLOWING MASS CASUALTY EVENTS

Simon M. Glasgow, MBBS, BSc, DMCC, MRCEM, MRCS, Christos Vasilakis, Zane Perkins, Susan I. Brundage, MD, MPH, FACS*, Nigel Tai, Karim Brohi
Queen Mary University of London

Presenter: Simon M. Glasgow, MBBS, BSc, DMCC, MRCEM, MRCS

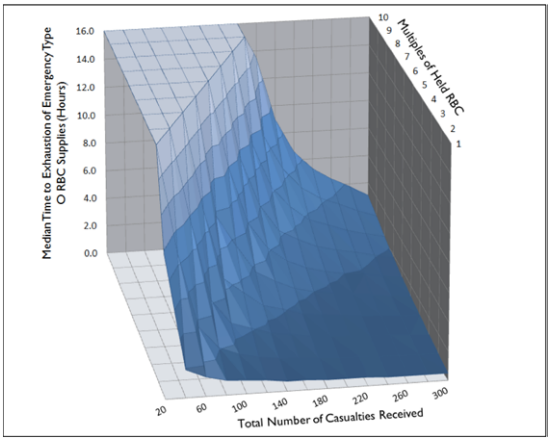
Discussant: Eric Campion, MD, University of Colorado/Denver Health Medical Center

Objectives: Traumatic hemorrhage is a leading preventable cause of mortality following mass casualty events (MCEs). Improving outcomes requires adequate in-hospital provision of high volume red blood cell (RBC) transfusions. This study investigated strategies for optimizing RBC provision to casualties in MCEs using simulation modeling.

Methods: A computerized simulation model of a UK major trauma centre (MTC) transfusion system was developed. The model used input data from past MCEs, civilian and military trauma registries. We simulated the effect of varying on-shelf RBC stock hold and the timing of externally restocking RBC supplies on MTC treatment capacity across increasing loads of priority one (P1) and two (P2) casualties from an MCE.

Results: 35,000 simulations were performed. A casualty load of 20 P1&2s under standard MTC RBC stock conditions left 35% (95% CI 32-38) of P1s and 7% (4-10) of P2s inadequately treated for hemorrhage. Additionally, exhaustion of type O emergency RBC stocks (a surrogate for reaching surge capacity) occurred in a median of 10hrs (IQR 5->12). Doubling the casualty load increased this to 60% (57-63) & 30% (26-34) respectively with capacity reached in 2hrs (1-3). The model identified a minimum requirement of 12U of on-shelf RBCs per P1/2 casualty received to maintain optimum care and avoid surge capacity being reached (Figure 1). Restocking supplies in an MCE versus greater permanent on-shelf RBC stock holds was considered at increasing hourly intervals. T-test analysis showed no difference between stock hold versus supply restocking in terms of overall outcomes for MCEs up to 80 P1&2s in size ($p<0.05$), provided the restock occurred within 6hrs.

Conclusions: Even limited sized MCEs threaten to overwhelm MTC transfusion systems. An early automated push approach to restocking RBCs initiated by regional suppliers can produce equivocal outcomes compared with holding excess stock permanently at MTCs.



Time to exhaustion of emergency type O red blood cell stock (a surrogate for reaching surge capacity) in relation to increasingly larger mass casualty events and with further multiples of the standard on-shelf red blood cell stock available at a UK major trauma centre prior to a mass casualty event.

Notes

Scientific Session I - Raymond H. Alexander, MD Resident Paper Competition
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #8
January 13, 2016
10:40 am

UTILITY OF CPR IN HEMORRHAGIC SHOCK, A DOG MODEL

David R. Jeffcoach, MD, Juan Gallegos, Sophy Jesty, Patricia Coan, Jason Chen, Robert Heidel, Brian J. Daley, MD, MBA*
University of Tennessee Medical Center-Knoxville

Presenter: David R. Jeffcoach, MD

Discussant: Jacob Glaser, MD, NAMRU San Antonio

Objectives: Cardiopulmonary resuscitation was designed for sudden cardiac events usually triggered by thrombotic phenomena. Despite this, it is routinely employed in trauma resuscitations as per the American Heart guidelines. There is no data as to the utility of chest compressions in hemorrhagic shock. An evidence based CPR protocol has now been developed for dogs. We sought to determine the effects and outcomes of chest compressions in hemorrhagic shock in a canine model.

Methods: Eighteen dogs were randomized to three treatment groups - Chest compressions only after hemorrhagic shock (CPR), chest compressions with fluid resuscitation after hemorrhagic shock (CPR+FLU) and fluid resuscitation alone after hemorrhagic shock (FLU). Under anesthesia dogs were hemorrhaged until pulse was lost; they were maintained in a pulseless state for 30 minutes and then resuscitated over 20 minutes. Vital signs and laboratory values were recorded at determined intervals. Echocardiography was performed throughout the study. Upon termination of the study kidney, liver, heart and brain tissue histology was evaluated for evidence of end organ damage. Statistical significance was $p<0.05$ with a Bonferroni correction for multiple comparisons.

Results: Bloodloss and mean time to loss of pulse was similar between groups. Dogs in the CPR group had significantly lower MAP and higher pulse at all points compared to CPR+FLU and FLU ($p<0.05$). Ejection fraction was lower in the CPR group at 5 and 10 minutes compared to the other groups ($p<0.05$). Vital signs and labs between CPR+FLU and FLU were equivalent. Two of six dogs in the CPR group died while no dogs died in CPR+FLU or FLU groups. Dogs in the CPR group were found to have more episodes of end organ damage.

Conclusions: There was no benefit to chest compressions in the hypovolemic animals. Chest compressions in addition to fluid did not reverse signs of shock better than fluids alone. CPR in hypovolemic shock should be abandoned.

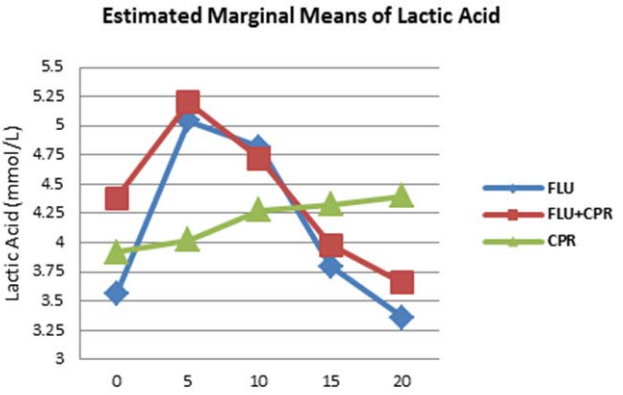


Figure 1: Change in lactic acid over time during the 20 minute resuscitation phase following hemorrhagic shock. FLU = Fluid Only (Crystaloid and Blood). FLU+CPR = Fluid and Cardiopulmonary Resuscitation. CPR = Cardiopulmonary Resuscitation Only

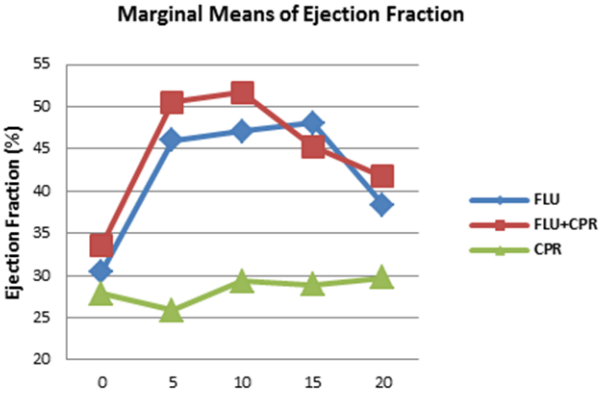


Figure 2: Change in calculated ejection fraction over time during the 20 minute resuscitation phase following hemorrhagic shock. FLU = Fluid Only (Crystaloid and Blood). FLU+CPR = Fluid and Cardiopulmonary Resuscitation. CPR = Cardiopulmonary Resuscitation Only

Notes

Scientific Session I - Raymond H. Alexander, MD Resident Paper Competition
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #9
January 13, 2016
11:00 am

NOT ALL PREHOSPITAL TIME IS EQUAL: INFLUENCE OF SCENE TIME ON MORTALITY

Joshua B. Brown, MD, MSc*, Matthew R. Rosengart, MD, MPH, FACS*,
Raquel M. Forsythe, MD*, Benjamin R. Reynolds, MPAS, PA-C *, Andrew B. Peitzman, MD*,
Timothy Billiar, MD, Jason L. Sperry, MD, MPH*
University of Pittsburgh Medical Center

Presenter: Joshua B. Brown, MD, MSc - @joshua_b_brown

Discussant: Lance Stuke, MD, Louisiana State University

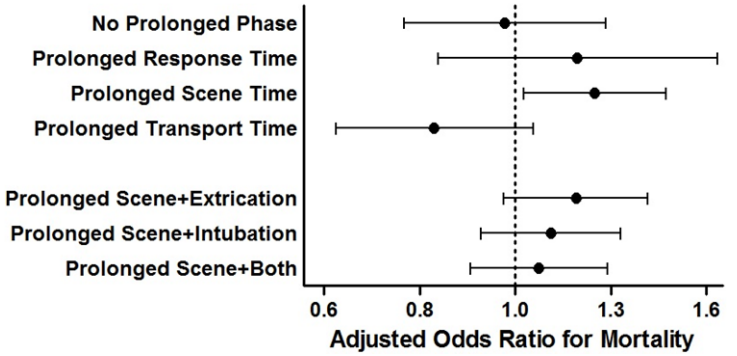
Objectives: Trauma is time-sensitive and minimizing prehospital (PH) time is conceptually appealing. However, many studies have failed to link increasing PH time with worse outcomes, as raw PH times are highly variable. It is unclear whether a specific pattern of PH time based on PH phase (response/scene/transport) affects outcome. Our objective was to evaluate the influence of PH time pattern on mortality.

Methods: Patients transported by EMS in the Pennsylvania trauma registry 2000-13 with total prehospital time (TPT) ≥20min were included. The relative proportion of TPT was calculated for each PH time phase. A prolonged phase was defined as a PH phase contributing ≥50% of TPT. PH time pattern was grouped by presence of a prolonged PH phase or no prolonged PH phase (all PH phases <50% of TPT). Patients were matched for TPT and conditional logistic regression determined the association of mortality with PH time pattern, controlling for confounders.

Results: 164,471 patients were included. Table 1 shows group characteristics. Patients with prolonged scene time had increased odds of mortality (OR 1.21; 95%CI 1.02-1.44, p=0.02). Prolonged response time, transport time, and no prolonged PH phase were not associated with mortality (Fig). Requiring extrication and PH intubation were potential mediators, associated with both prolonged scene time ($p<0.01$) and mortality ($p<0.01$). Adjusting for these factors, prolonged scene time was no longer associated with increased mortality (OR 1.06; 0.90-1.25, p=0.50), while extrication (OR 1.46; 1.23-1.72, $p<0.01$) and PH intubation (OR 4.53; 3.52-5.82, $p<0.01$) were.

Conclusions: Prolonged scene time is associated with increased mortality in trauma patients. PH factors that prolong scene time may mediate this association. Further study should evaluate whether these factors drive increased mortality because they prolong scene time or by another mechanism, as reducing scene time may be a target for intervention.

TABLE 1	No prolonged prehospital time N=78,782 (48%)	Prolonged response time N=2,386 (2%)	Prolonged scene time N=32,026 (19%)	Prolonged transport time N=51,277 (31%)
Response time [min, med (IQR)]	11 (7, 15)	24 (20, 28)	4 (4, 9)	7 (4, 11)
Scene time [min, med (IQR)]	15 (11, 20)	9 (4, 11)	22 (17, 28)	11 (9, 15)
Transport time [min, med (IQR)]	15 (13, 22)	11 (7, 15)	11 (7, 15)	26 (22, 35)
Total prehospital time [min, med (IQR)]	42 (33, 54)	43 (33, 50)	39 (30, 50)	48 (37, 59)
Response time [med % of total time (IQR)]	25.9 (19.6, 33.3)	52.9 (50.0, 57.1)	13.6 (8.3, 19.0)	15.3 (9.5, 21.2)
Scene time [med % of total time (IQR)]	36.6 (29.7, 42.9)	19.6 (13.7, 25.4)	56.4 (52.4, 62.0)	25.9 (19.0, 32.3)
Transport time [med % of total time (IQR)]	39.2 (33.3, 44.1)	27.0 (19.4, 32.3)	28.3 (21.2, 34.6)	56.9 (52.6, 62.9)
Age [yrs, med (IQR)]	47 (29, 69)	40 (25, 57)	48 (30, 70)	53 (34, 75)
Mechanism (% blunt)	92.9	90.7	92.3	94.5
ISS [med (IQR)]	10 (5, 19)	13 (8, 21)	10 (5, 19)	9 (5, 16)
Head AIS≥3 (%)	24.5	24.7	24.9	20.1
Transport mode (%)				
Ground	64.4	40.5	84.5	90.6
Helicopter	35.6	59.5	15.5	9.4
Extrication required (%)	16.5	19.9	21.5	8.9
Prehospital level of care (%)				
BLS	7.6	6.1	5.8	13.8
ALS	92.4	93.9	94.2	86.2
Prehospital intubation (%)	6.9	6.0	8.1	1.1
Mortality (%)	7.3	8.0	9.4	4.5



Notes

Scientific Session I - Raymond H. Alexander, MD Resident Paper Competition
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #10
January 13, 2016
11:20 am

CREATION OF A DECISION AID FOR GOAL-SETTING AFTER GERIATRIC BURNS

Erica I. Hodgman, MD, Bellal Joseph, MD, Jane Mohler, Steven E. Wolf, MD*, Elizabeth Paulk, Ramona Rhodes, Paul Nakonezny, Herb A. Phelan III, MD, FACS*
University of Texas Southwestern Medical Center

Presenter: Erica I. Hodgman, MD

Discussant: Jeffrey Carter, MD, Wake Forest School of Medicine

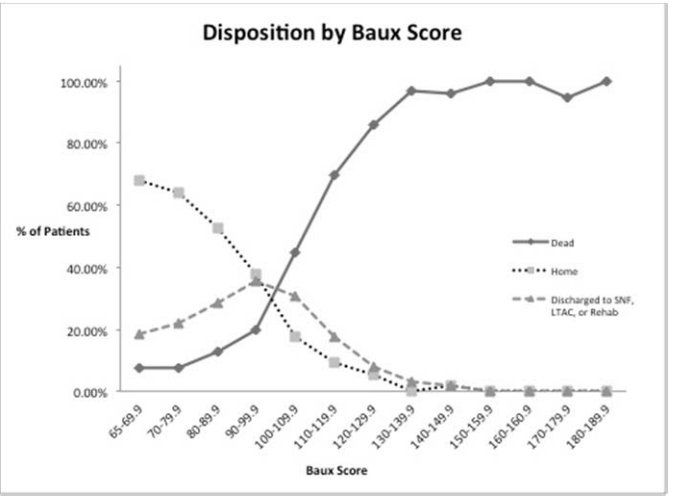
Objectives: It is imperative to delineate goals of care early after geriatric burn admission by reconciling patients' values and preferences with accurate prognostic information. We hypothesized that a decision-support aid to predict index admission mortality and discharge disposition for geriatric burns could be constructed based on the well-accepted Baux score (age + total body surface area burned) utilizing a geriatric cohort from a national burn registry.

Methods: The National Burn Repository version 8.0 (2002-2011) was queried for all patients aged ≥65 yrs. Exclusion criteria were: elective admits; non-burn injuries; unknown inhalation injury status; transfer to another burn center; and/or length of stay ≤1 day. Patients were grouped into Baux score deciles. The incidence of each discharge outcome (death, home, discharge to an alternate setting) was measured per decile. Receiver operating curve analysis was done to determine optimal Baux scorecutpoints based on the Youden Index in discriminating between discharge dispositions.

Results: The sample was 8,001 patients (Table 1). Withdrawal of care was documented in 17.5% of deaths (n=264); median time to withdrawal was 3 days (range 0-231). As Baux score increased, three peaks in disposition were seen (Figure 1). Baux score <86.15 was predictive of discharge home (AUC 0.698, 75.28% sensitivity, 54.64% specificity), a score >77.12 predicted discharge to an alternate setting (AUC 0.539, 74.91% sensitivity, 34.38% specificity), and a score >93.3 was predictive of mortality (AUC 0.779, 57.46% sensitivity, 87.08% specificity).

Conclusions: For geriatric burn patients whose Baux scores exceed 87, return-to-home rates drop drastically; risk of mortality increases dramatically at a score of 93, and mortality is nearly universal at a score of 130 and above. We are piloting a display of the descriptive data as a decision-making aid when setting goals of care with stakeholders after geriatric burns.

Table 1: Selected demographics by Baux Score													
Baux Score decile	65 - 69.9	70 - 79.9	80 - 89.9	90 - 99.9	100 - 109.9	110 - 119.9	120 - 129.9	130 - 139.9	140 - 149.9	150 - 159.9	160 - 169.9	170 - 179.9	180 - 189.9
n	766	2466	2465	1241	498	211	135	64	52	43	35	18	7
Age (median)	66.82	71.37	79.20	83.21	81.00	80.60	80.90	77.00	80.42	79.32	82.70	80.75	89
Sex (%M)	499 (65.1%)	1494 (60.6%)	1345 (54.6%)	672 (54.2%)	282 (56.6%)	129 (61.1%)	79 (58.5%)	41 (64.1%)	30 (57.7%)	20 (46.5%)	19 (54.3%)	10 (55.6%)	5 (71.4%)
% TBSA (median)	0.10	3.0	5.00	11.0	23.00	34.50	43.18	58.0	65.0	74.0	82.5	91.0	97.0
Inhalation injury	97 (12.7%)	331 (13.4%)	329 (13.3%)	1086 (12.5%)	108 (21.7%)	78 (37.0%)	62 (45.9%)	34 (53.1%)	27 (51.9%)	27 (58.1%)	25 (71.4%)	11 (61.1%)	3 (42.9%)



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Paper #11
January 13, 2016
11:40 am

PERIOPERATIVE RISK FACTORS IMPACT OUTCOMES AMONG EMERGENCY VERSUS NON-EMERGENCY SURGERY DIFFERENTLY: TIME TO SEPARATE OUR NATIONAL RISK-ADJUSTMENT MODELS?

Jordan D. Bohnen, MD, MBA, Elie Ramly, Naveen F Sangji, Marc A. deMoya, MD*, Daniel Dante Yeh, MD*, Jarone Lee, MD, MPH*, George Velmahos, MD, PhD, MSEd, David C. Chang, Haytham Kaafarani, MD, MPH*
Massachusetts General Hospital

Presenter: Jordan D. Bohnen, MD, MBA

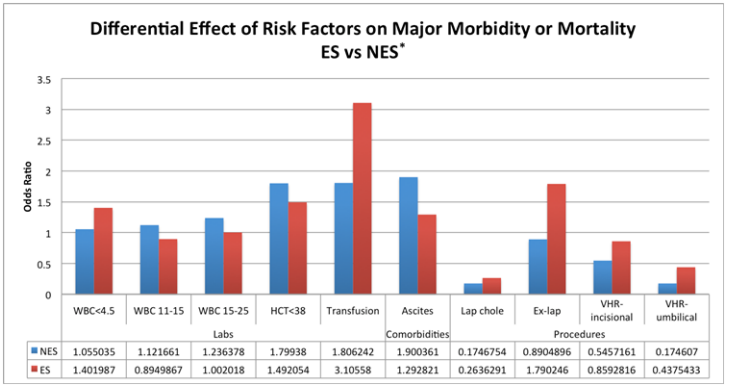
Discussant: David S. Morris, Mayo Clinic

Objectives: Emergency surgery (ES) carries a different risk profile than non-emergency surgery (NES). Yet, little is known about how perioperative risk factors affect 30-day outcomes in ES vs NES.

Methods: Using the 2011-2012 ACS-NSQIP database, the 20 most common ES procedures were identified by CPT code. CPT codes with <300 observations in either ES or NES were excluded. ES cases were defined as "Emergent" & "non-elective" per ACS-NSQIP criteria. Multivariable regression models were constructed to identify predictors of 30-day major morbidity or mortality (MMM)) in each group, controlling for demographics, ASA, comorbidities, preop labs, and procedure type. Odds Ratios of independent predictors of MMM in ES and NES were derived then compared between groups; "effect modification" of procedure status (ES vs NES) on each risk factor was subsequently calculated. Statistical significance was set at $p<0.05$.

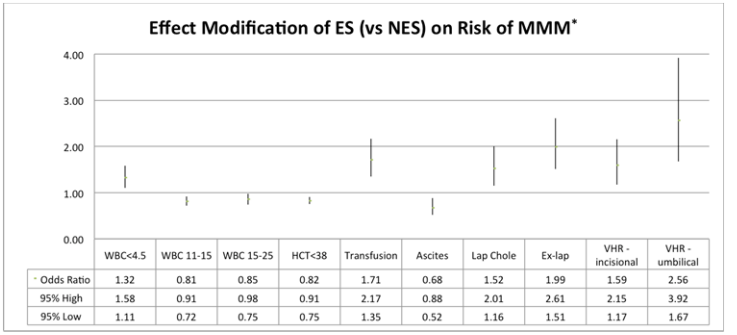
Results: Of 986,034 patients, 170,131 met inclusion criteria (59,949 ES, 110,182 NES). Overall risk of MMM was significantly higher in ES vs NES (16.75% vs. 9.73%, $p<0.001$). Out of 40 ES and 38 NES-identified independent risk factors, preop transfusion and WBC≤4.5 carried significantly higher risk of MMM in ES vs NES (Figure 1). Conversely, ascites, preop anemia, and leukocytosis (WBC 11-25) carried greater risk for MMM in NES. Four procedures (laparoscopic cholecystectomy, laparotomy, umbilical and incisional herniorrhaphies) were riskier in ES vs NES. The effect modification of ES (vs NES) on the risk of MMM for each of these variables is shown in Figure 2.

Conclusions: Perioperative risk factors impact postoperative morbidity and mortality differently in ES vs NES. Instead of using the same risk-adjustment model for both ES and NES, as currently practiced, our findings strongly suggest the need to benchmark emergent and elective surgeries separately.



	WBC<4.5	WBC 11-15	WBC 15-25	HCT<38	Transfusion	Ascites	Lap chole	Ex-lap	VHR-incisional	VHR-umbilical
	Labs					Comorbidities	Procedures			
NES	1.055035	1.121661	1.236378	1.79938	1.806242	1.900361	0.1746754	0.8904896	0.5457161	0.174607
ES	1.401987	0.8949867	1.002018	1.492054	3.10558	1.292821	0.2636291	1.790246	0.8592816	0.4375433

* ES and NES regressions used the same demographic, comorbidity, laboratory, CPT code, and other variables (eg. ASA, Sepsis, transfer, functional dependence). Each variable was captured in at least 50% of cases. Final ES regression contained 46,310 observations (AUROC 0.9078). Final GS regression contained 84,150 observations (AUROC 0.8768).



	WBC<4.5	WBC 11-15	WBC 15-25	HCT<38	Transfusion	Ascites	Lap Chole	Ex-lap	VHR - incisional	VHR - umbilical
Odds Ratio	1.32	0.81	0.85	0.82	1.71	0.68	1.52	1.99	1.59	2.56
95% High	1.58	0.91	0.98	0.91	2.17	0.88	2.01	2.61	2.15	3.92
95% Low	1.11	0.72	0.75	0.75	1.35	0.52	1.16	1.51	1.17	1.67

* Odds ratios for effect modification calculated from multivariate regression with the same set of variables used to generate Figure 1. This regression for effect modification contained 130,460 observations (AUROC = 0.8918).

Notes

Scientific Session III-A - Trauma
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #12
January 14, 2016
8:00 am

SUCTION EVACUATION OF HEMOTHORAX: A PROSPECTIVE STUDY

Stephanie Savage, MD, MS, George A Cibulas, II, PharmD, MD, Tyler A Ward,
Ben L. Zarzaur, MD, MPH*, Corinne A. Davis
University of Tennessee Health Science Center - Memphis

Presenter: Stephanie Savage, MD, MS

Discussant: Ali Salim, MD, Brigham & Women's Hospital

Objectives: While tube thoracostomy is common following thoracic trauma, incomplete evacuation of fluid places the patient at risk for retained fluid. As little as 300-500cc may require a second thoracostomy tube or, in more severe cases, lung entrapment and empyema. We hypothesized that suction evacuation of the thoracic cavity prior to tube placement would decrease incidence of retained hemothorax and late complications.

Methods: Patients requiring tube thoracostomy within 4 days of admit were prospectively identified and had suction evacuation of the thoracic cavity (YATS) prior to chest tube placement. Study patients were compared to historical controls (CON), who had standard tube thoracostomy placement. Data on demographics, admission vital signs and laboratory values and outcomes were collected on all patients. Multivariate logistic regression was used to compare outcomes between groups.

Results: 205 patients were identified. 9 were excluded leaving 94 CON patients and 102 YATS patients. There were no differences in basic demographics, injury severity, admission labs or vital signs or hospital length of stay. Mean hemothorax volume in YATS patients was 218cc (min 0cc, max 1500cc), with only 42% have a volume greater than 100cc evacuated at tube placement. 3 patients developed empyema and 19 demonstrated retained fluid; there was no difference between YATS and CON patients (Table). YATS was significantly protective against recurrent pneumothorax following chest tube removal (OR 0.332; 95% CI 0.148, 0.745).

Conclusions: Preemptive suction evacuation of the thoracic cavity is well-tolerated and simple. It neither protected against, or contributed to, late empyema or retained hemothorax. Suction evacuation did significantly decrease recurrent pneumothorax. Though the mechanism is unclear, such a benefit may make this simple procedure worthwhile. A larger sample size is required for validation and to determine if preemptive thoracic evacuation has a clinical benefit.

Variable	N	Odds Ratio (95% CI)	p-value
Empyema/Retained Hemothorax	3/19	1.576 (0.574, 4.330)	0.3778
Residual Pneumothorax	24	0.332 (0.148, 0.745)	0.0076

Notes

Scientific Session III-A - Trauma
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #13
January 14, 2016
8:20 am

AGE IS JUST A NUMBER: OSTEOPENIA AND SARCOPENIA ARE BETTER PREDICTORS OF INJURY SEVERITY THAN CHRONOLOGIC AGE

Morgan Oskutis, Margaret H. Lauerman, MD*, Joseph A Kufera, MA,
Cynthia Burch, MPH, Shiu Ho, Thomas M. Scalea, MD, FACS, FCCM*,
Deborah M. Stein, MD, MPH, FACS, FCCM*
University of Maryland School of Medicine

Presenter: Morgan Oskutis

Discussant: Bellal Joseph, MD, The University of Arizona

Objectives: In the modern era, chronologic age often does not reflect health. Many older patients are physically active and vibrant, while many younger patients are less functional and phenotypically older than their age. While chronologic age has been associated with morbidity and mortality after motor vehicle crashes, markers targeted towards patient strength and durability are likely better contemporary predictors of injury development and severity.

Methods: The Crash Injury Research and Engineering Network (CIREN) database, which collects crash and patient information, provides a unique opportunity to control for crash characteristics and severity. Computed Tomography (CT) images of patients 40 years of age and above were analyzed for radiographic markers of osteopenia and sarcopenia, and compared with presence of injury and injury severity. Injuries likely susceptible to fragility were chosen.

Results: 202 patients from the CIREN database were included. In univariate analysis, patients with sarcopenia were associated with severe thoracic injury ($p= 0.03$), but neither sarcopenia nor osteopenia was associated with severe spine, upper extremity, or lower extremity injury. However, when a multivariable analysis was created controlling for age and crash variables, osteopenia was the only factor significantly associated with a severe spine injury ($p=0.02$), with osteopenic patients sustaining a severe spine injury at a rate of 4 times the non-osteopenic patients. Sarcopenia, was also associated with development of a severe thoracic injury ($p=0.007$). Chronologic age was not significantly associated with developing either severe spine injury or severe thoracic injury when controlling for crash variables.

Conclusions: Osteopenia and sarcopenia are associated with severity of injury. Radiographic markers provide a better assessment of patient susceptibility to injury than chronologic age.

Notes

Scientific Session III-A - Trauma
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #14
January 14, 2016
8:40 am

IMPROVING OUTCOMES OF INJURED GERIATRIC PATIENTS: SMALL STEPS, BIGGER PROBLEM.

Peter M. Hammer, MD*, Annika Storey, Demetria Bayt, Teresa Bell,
Ben L. Zarzaur, MD, MPH*, David V. Feliciano, MD, FACS*,
Grace S. Rozycki, MD, MBA, FACS*
Indiana University

Presenter: Peter M. Hammer, MD

Discussant: Kevin Pei, MD, Yale School of Medicine

Objectives: Due to the unique physiology and co-morbidities of injured geriatric patients, specific interventions are needed to improve outcomes. The purpose of this study was to assess the effect of a change in triage criteria for injured geriatric patients evaluated at an ACS Level I trauma center.

Methods: As of October 1, 2013, all injured patients >70 years of age were mandated to have Level I (highest) trauma activations upon arrival in the emergency department regardless of physiology or mechanism of injury. Patients admitted prior to that date were designated PRE, while those admitted after that date were designated POST, and the study period was from January 1, 2012, through April 30, 2015. Data collected included demographics, Injury Severity Score (ISS), comorbidities, emergency department length of stay (ED LOS) and overall length of stay, complications and mortality. PRE vs. POST ED LOS and overall length of stay were compared using Wilcoxon Rank Sum Test and multinomial regression, while PRE vs. POST mortality was compared using multivariable logistic regression, with $p<0.05$ = significant.

Results: 2,494 patients (mean age = 80.63 years; mean ISS = 12.2; PRE 1,397/POST 1,097) were included in the study. On multivariable analysis, increasing age, higher ISS, and renal comorbidity were all associated with higher mortality. POST patients were more likely to have an ED LOS <2 hours (OR 1.47, 95% CI 1.011-2.137) after controlling for age, ISS, and comorbidities. Also, POST mortality was significantly decreased (OR 0.634, 95% CI 0.45-0.823).

Conclusions: Based on age alone, the focused intervention of a higher level of trauma activation decreased ED LOS and mortality in injured geriatric patients.

Notes

Scientific Session III-A - Trauma
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #15
January 14, 2016
9:00 am

THE PROFILE OF WOUNDING IN CIVILIAN ACTIVE SHOOTER FATALITIES

E. Reed Smith, MD, Geoff Shapiro, Babak Sarani, MD, FACS, FCCM*
George Washington University

Presenter: E. Reed Smith, MD - @CommitteeTECC

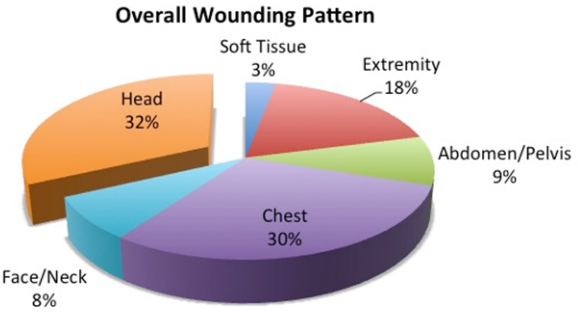
Discussant: Matthew Martin, MD, Madigan Army Medical Center

Objectives: Since the 2012 mass shooting in Newtown, CT, there has been focus on improving survival in active shooter events with emphasis on tourniquets/external hemorrhage control. This guidance is based on combat wounding patterns where 9% of deaths are due to extremity hemorrhage. We hypothesize that wounding in active shooter events differs from combat and thus may require different therapeutic emphasis. As such, we seek to define the fatal wounding pattern in civilian active shooter events.

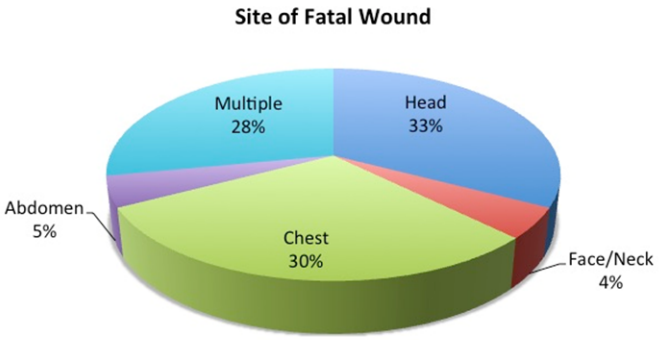
Methods: Autopsy reports from randomly selected active shooter events with 5 or more fatalities from 1983-2012 were requested through the Freedom of Information Act. If precluded by state law, a de-identified summary of all wounds and causes of death was requested. We reviewed the reports to determine the anatomic region for every wound, site of fatal injury, and whether the wounds were potentially survivable assuming pre-hospital care within 15 minutes and definitive care within 60 minutes of injury.

Results: We received reports from 8 events including 107 victims with 231 wounds. The head was both the most commonly injured region (33%) and the most common fatal injury (tables 1 and 2). 28% of victims had fatal injuries to multiple anatomic regions. Although 22% of wounds were to the extremities, none of the autopsies showed extremity hemorrhage to be the cause of death. 6 victims had isolated wounds to the torso that were considered survivable.

Conclusions: The wounding pattern in civilian active shooter fatalities differs from that in combat. Fatal injury was from non-survivable brain or torso injury in all cases. Although tourniquets and external hemorrhage control techniques hold value, their role in active shooter events may be over-emphasized as a means to decrease fatality. Instead, rapid access to the wounded, initiation of damage control resuscitation, and rapid extrication to definitive care may offer a more effective means to minimize mortality.



Overall Wounding Pattern in Fatalities



Site of Fatal Wound

Notes

Paper #16
January 14, 2016
9:20 am

OUTCOMES OF LOWER EXTREMITY VASCULAR REPAIRS EXTENDING BELOW THE KNEE: A MULTICENTER RETROSPECTIVE REVIEW

Gerald Richard Fortuna, Jr., MD*, Joseph J. DuBose, MD*, Mina Boutrous, Ranan Mendelsberg, Kenji Inaba, MD, Ansab Haider, Bellal Joseph, MD, David J. Skarupa, MD, Matthew Selleck, Jan-Holly Nicolas, Xian Luo-Owen, Chad Ball, Ali Azizzadeh, Kristofer Charlton-Ouw
University of Texas Health Science Center at Houston

Presenter: Gerald Richard Fortuna, Jr., MD

Discussant: Scott Brakenridge, MD, University of Florida

Objectives: To determine the outcomes of vascular injury interventions extending below the knee.

Methods: Vascular injury repairs extending below the knee from Jan 2008 – Dec 2014 were collected from 6 ACS Level I trauma centers. Demographics, management and outcomes were collected and analyzed.

Results: 194 vascular injuries were identified; Mean age 33.7, 88.1% male, 71.1% blunt injury. Admission SBP was < 90 mm Hg in 10.8%; pre-hospital tourniquets utilized in 5.6%. Median MESS Score was 6.0 [IQR 6]. Imaging used included CTA (58.2%) and angiography (7.2%); 66 (34.0%) proceeding directly to OR based upon exam. Vascular interventions were conducted primarily by vascular (66.0%) and trauma (25.3%) surgeons at a median time from injury of 8 hours (IQR 7). Initial interventions included graft interposition (57.7%) with saphenous vein (111) or synthetic graft (1), primary repair (14.9%), endovascular stent-graft (1.5%) and patch angioplasty (2.1%). Fasciotomy was done at initial operation in 41.8%, and for delayed compartment syndrome in 2.1%. Vascular re-intervention was required in 20 patients (6.7%) for bleeding (7) or thrombosis (13). There was no difference between specialties with regards to re-intervention need. There was a trend towards higher re-intervention rates for thrombosis among interposition grafts with distal anastomotic sites at the below-knee popliteal compared to those extending to the tibioperoneal trunk or distal trifurcation vessels (4/60, 6.7% vs. 6/49, 12.2%; *p = 0.34*). Post-intervention amputation rates were significantly higher among interposition grafts extending distal to the popliteal (4/60, 6.7% vs. 15/49, 30.6%; p = 0.006).

Conclusions: The management of vascular injuries extending below the knee remains a complex issue of extremity trauma care. The need for delayed amputation is significantly more common when revascularization below the distal popliteal artery is required.

Notes

Scientific Session III-A - Trauma
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #17
January 14, 2016
9:40 am

MILITARY INJURY SEVERITY SCORE: A BETTER PREDICTOR OF COMBAT-RELATED MORTALITY THAN INJURY SEVERITY SCORE

Kirby R. Gross, MD*, Jean Orman, ScD, Zsolt T. Stockinger, MD, FACS*,
Mary Ann Spott, MPA, MSIS, MBA, Susan West, Michael Galarneau,
Edward Mazuchowski, Tuan Le, MD, DrPH
US Army Institute of Surgical Research

Presenter: Kirby R. Gross, MD

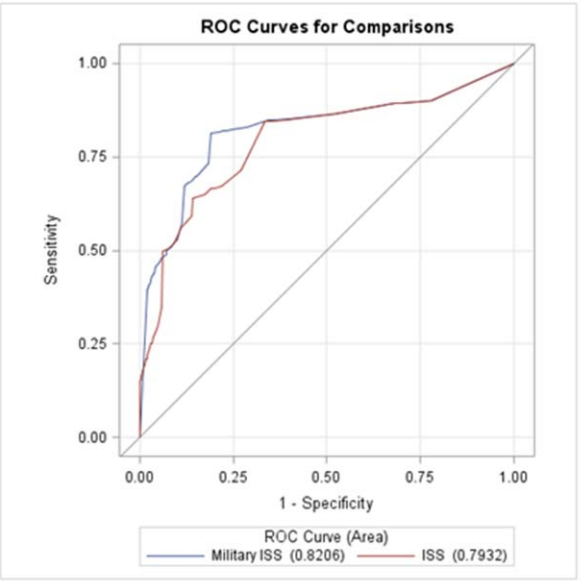
Discussant: Travis Polk, MD, Naval Medical Center Portsmouth

Objectives: We compared military Injury Severity Score (mISS) & Injury Severity Score (ISS) as predictors of combat-related mortality.

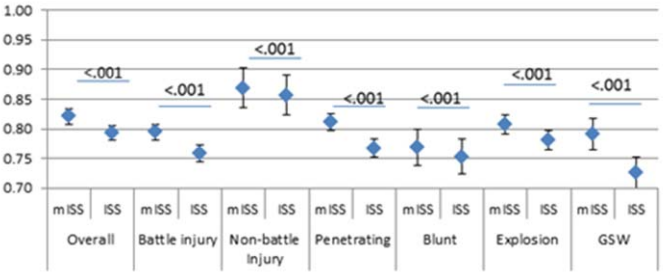
Methods: DoD Trauma Registry data for patients wounded in Iraq & Afghanistan in 1/2003-12/2014 were analyzed. ISS is the sum of the squares of the 3 most worst AIS scores from 6 body regions; mISS is a variant of ISS but uses AIS 2005-Military score developed by a panel of military trauma surgeons. Mortality was the primary outcome.Area under the ROC curve (AUC) was used to discriminate between mISS & ISS. Sensitivity & specificity were compared. Logistic regression was used to calculate the likelihood of mortality by levels of mISS & ISS overall & by battle (BI) vs. non-battle (NBI), type & mechanism of injury. Mann-Whitney or t-test & chi-square test were used. $P < 0.05$ is significant.

Results: A total of 30,364 patients were analyzed. Median [IQR] age was 24 [21-29]. BI was 65.3%. Penetrating (39.5%) & blunt (54.2%), types & explosion (51%) & gunshot (15%) mechanisms predominated. The total mortality rate was 6.0%.Median mISS & ISS were 5.0 [2.0-13.0] & 5.0 [2.0-10.0] overall, 5 [2-10] & 5 [2-10] in survivors, 30 [16-75] & 24 [9-23] in non-survivors, respectively. mISS & ISS scores were discordant in 5,352 patients (17.6%), accounting for 56.2% of deaths. For cases with discordant severity scores, the median difference between mISS & ISS was 9 [7-16]; range 1-59. mISS & ISS shared 78% variability (R^2=0.78). AUC was higher in mISS than ISS overall (0.82 vs 0.79), for BI (0.79 vs 0.76), NBI (0.87 vs 0.86), penetrating (0.81 vs 0.77), blunt (0.77 vs 0.75), explosion (0.81 vs 0.78), & gunshot wound (0.79 vs 0.73), all *P*-values < 0.001. Higher mISS & ISS were associated with an increased risk of mortality; mISS had higher sensitivity than ISS (81.2 vs 63.9) but slightly lower specificity (80.2 vs 85.7).

Conclusions: mISS is a better predictor of combat-related mortality than ISS.



Comparison of the ROC curves between military Injury Severity Score (mISS) and Injury Severity Score (ISS) for predicting combat-related mortality



Comparison of AUC between military Injury Severity Score (mISS) and Injury Severity Score (ISS) for predicting combat-related mortality overall, injury classification (battle- vs Non-battle injury), injury type (penetrating vs blunt), and injury mechanism (explosion vs gunshot wound)

Notes

Scientific Session III-B - Cox-Templeton Injury Prevention Competition
Location: Nelson Wolff Exhibit Hall A, Level 1

Paper #18
January 14, 2016
8:00 am

TRAUMA IS AN INDEPENDENT FACTOR FOR BRIEF INTERVENTION SUCCESS.

Peter Ehrlich, MD, MSc, H BSc*, Jessica Roche, Rebecca Cunningham, MD, Stephen Chermack, PhD, Brenda Booth, PhD, Frederic C Blow, PhD, Kris Barry
University of Michigan

Presenter: Peter Ehrlich, MD, MSc, H BSc

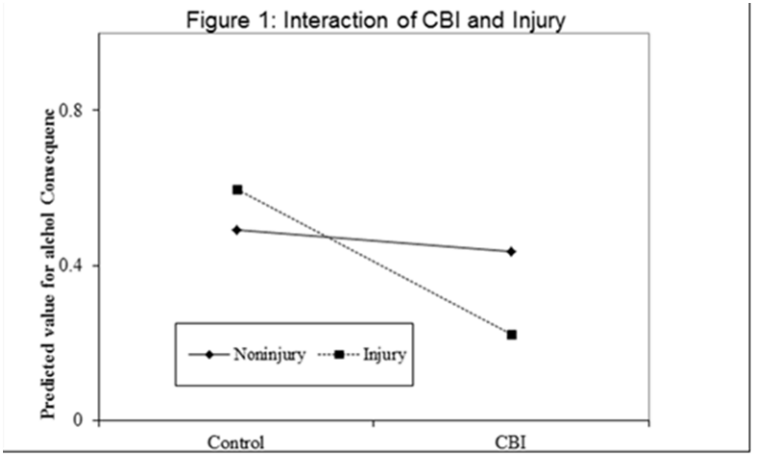
Discussant: Tiffany Overton, MA, MPH, JPS Health Network

Objectives: Few studies have examined whether presenting for injury affects the efficacy of a brief interventions' (BI) as compared to those presenting for other reasons. We recently completed a Randomized Control Trial (RCT) comparing the efficacy of BI delivered by computer or a therapist to a control group among underage risky drinkers at an Emergency Department. The RCT showed that compared to the control, the therapist BI and computer BI significantly reduced alcohol consumption and alcohol-related consequences at 3 and 12 months. Our hypothesis is that injury is an moderator of intervention response.

Methods: Patients (ages 14-20) screening positive for risky drinking (AUDIT-C score) completed a baseline assessment and were randomized to: a computer-delivered BI (n=277), a therapist-delivered BI (n=278), or a control (n=281). Regression models examined effects of the BI and interaction effects of those presenting to the ED with injury at baseline

Results: Among 4389 patients screened, 24.0% (n=1054) reported risky drinking and 836 (79.3% participation) were enrolled in the RCT (mean age = 18.6, 51.6% male, 79.4% Caucasian) of which 303 (36.2%) had a primary complaint of injury. At baseline, injured patients were more likely to be male ($p < 0.001$), have higher alcohol consumption ($p < 0.01$), but were less likely to misuse prescription drugs ($p=0.02$). There were no differences in race, illicit drug use or frequency of alcohol consequences at presentation. Regression models demonstrated that at the 3(and 12) month follow-up the computer BI was more effective at reducing alcohol consequences among those presenting with injury. There was no difference in the efficacy of the computer BI based on injury presentation on alcohol consumption. In contrast, ED presentation did not affect the efficacy of the therapist BI on alcohol consumption or consequences.

Conclusions: Injury is an independent factor of BI success.



Interaction of Injury and Brief Intervention

Notes

Scientific Session III-B - Cox-Templeton Injury Prevention Competition
Location: Nelson Wolff Exhibit Hall A, Level 1

Paper #19
January 14, 2016
8:20 am

HOME SAFE HOME: EVALUATION OF A CHILDHOOD HOME SAFETY PROGRAM

Tanya Charyk Stewart, B.Sc, M.Sc, Jane Harrington, Jason Gilliland, Michael Miller, Tania Haidar, Brandon Batey, kelly vogt, Neil G. Parry, MD*, Douglas D. Fraser, Neil Merritt
London Health Sciences Centre

Presenter: Tanya Charyk Stewart, B.Sc, M.Sc

Discussant: Brian Brewer, MD, Indianapolis University

Objectives: The Home Safety Program (HSP) provides safety devices, education, a safety video and home safety checklist to all first-time families for the reduction of childhood home injuries. The objective of this study was to evaluate the HSP for the prevention of home injuries in children up to 5 years of age.

Methods: A program evaluation was performed with participant follow up survey, along with an interrupted time-series analysis of ED visits for home injuries 5 years pre-implementation and 2 years post (2007-15). Spatial analysis of ED visits was undertaken to assess differences in home injury rates by dissemination areas controlling for social determinants (i.e., income, education, lone-parent status).

Results: A total of 3458 first-time families were given a HSP kit (74% compliance rate). Of these, 12% (n=407) of parents responded to our questionnaire with 93% reporting the program to be useful (median 6, IQR=2 on a 7-point Likert scale) and 78% learning new strategies for preventing home injuries. The most useful products were electric outlet covers, bath thermometers and cabinet locks. The home safety check list was used by 88% of respondents to identify hazards in their home, with 95% taking action to minimize the risk. Qualitative comments included *"The information built confidence for first-time parents. I felt much safer bringing my son home because of it."* The time-series demonstrated no significant difference in ED visits for home injuries in 0-5-year-olds post implementation. Spatial analysis revealed injury clusters.

Conclusions: Removing hazards, supervision and installing safety devices are key facilitators in the reduction of home injuries. First-time parents found our HSP useful to identify hazards, learn new strategies, build confidence and provide safety products. More time is required to definitively assess the HSP effect on home injury incidence. The spatial analysis can be used to target the HSP to families at highest risk.

Notes

Paper #20
January 14, 2016
8:40 am

CREATION OF THE FIRST HARTFORD CONSENSUS COMPLIANT SCHOOL IN THE UNITED STATES

Elie Ramly, Jordan D. Bohnen, MD, MBA, Peter Fagenholz, Marc A. deMoya, MD*,
George Velmahos, MD, PhD, MSEd, Daniel Dante Yeh, MD*,
Haytham Kaafarani, MD, MPH*, Kathryn Butler, MD*
Massachusetts General Hospital

Presenter: Jordan D. Bohnen, MD, MBA

Discussant: Michael F. Rotondo, MD, University of Rochester School of Medicine

Objectives: The Hartford Consensus established a framework for minimizing deaths due to mass shootings, specifically eliminating preventable deaths due to limb exsanguination. Two major principles defined within this framework are 1) redefining the first responder role and 2) the ubiquitous availability of tourniquets and proper training in application. We hypothesized that this hemorrhage control posture could be fully translated to an elementary school.

Methods: Following institutional review board approval, all teachers at a pre-kindergarten through 8th grade elementary school underwent short, intensive instruction on their role as a first responder, as well as indications and proper technique of tourniquet application for limb exsanguination. All teachers self-reported their confidence in tourniquet application indications and technique before and after instruction and results compared by paired t-test. Following instruction, teachers were evaluated on proper tourniquet application technique on a simulated limb to assess competence.

Results: 22 elementary school teachers and 2 administrative staff underwent training. All reported low confidence in tourniquet application technique and indications before training. Following training, all teachers reported improved, high confidence ($p<0.0001$). Testing demonstrated 100% compliance with correct tourniquet application technique. Following training, each classroom was equipped with a purpose-made commercial tourniquet, and a dedicated hemorrhage control bag was placed in the school's central administrative office.

Conclusions: All teachers were successfully trained in correct tourniquet application technique and verified by testing. Tourniquets were prepositioned throughout the school. This is the first elementary school to adopt a hemorrhage control posture to eliminate preventable deaths from limb exsanguination advocated by the Hartford Consensus.

Notes

Scientific Session III-B - Cox-Templeton Injury Prevention Competition
Location: Nelson Wolff Exhibit Hall A, Level 1

Paper #21
January 14, 2016
9:00 am

EVERY 15 MINUTES: A HIGH SCHOOL INTERVENTION TO REDUCE ALCOHOL RELATED COLLISIONS

Paul J. Chestovich, MD*, David Velez, Douglas R. Fraser, MD*, Deborah A. Kuhls, MD*,
Nichole Ingalls, MD, MPH*, Nadia Fulkerson,
Kelly Raybuck, Phillip Lynn, John J. Fildes, MD*
University of Nevada School of Medicine

Presenter: Paul J. Chestovich, MD

Discussant: Daryhl Johnson, MD, University of North Carolina at Chapel Hill

Objectives: Over 10,000 people are killed annually in the US in alcohol related crashes. Teen drivers are 3 times more likely to be in a fatal crash, 20% of which are alcohol related. *Every 15 Minutes* (E15M) is a 2-day high school program to reduce impaired driving. Our objective is to measure the impact of E15M on high school students.

Methods: Day 1 of E15M consists of a simulated crash, EMS rescue of the student victims, transport to trauma center and attempted resuscitation. Deceased students are taken to the morgue, parents notified, and the drunk driver is arrested, jailed, and sentenced to prison in court. Day 2 involves a school assembly with letters read by the deceased and impact speakers including trauma surgeons and actual DUI victims. Student surveys were conducted before and after the event. Participants were asked to rank the likelihood of engaging in activities using a 5-point Likert scales, with 1=”Much Less Likely” 3=”No Change” and 5=”Much More Likely.” Post-survey Likert averages were compared between groups defined by pre-survey behaviors using Wilcoxon Rank-Sum Test with $p<0.05$ significant.

Results: 63 students completed both pre and post surveys. Results are summarized in the Table below. After E15M, participants were highly unlikely to drive under the influence or ride with an impaired driver, but highly likely to stop a friend from driving impaired. No difference was seen between students with and without an active license. Students reporting alcohol use and drinking enough to get drunk showed greater likelihood to drive under the influence or ride with impaired driver, while these groups showed no difference at stopping a friend from driving impaired.

Conclusions: The E15M program is successful at changing the attitudes of high school students about the risks of driving and alcohol use. It is effective in all students, but appears to have the greatest impact on students not already using alcohol.

Post-Survey Likelihood (1=unlikely 5=likely)	All Participants N=63	Pre-Survey Behaviors: Active License Yes 50	Active License No 13	p	Drink Alcohol Yes 27	Drink Alcohol No 36	p	Drink to get "drunk" Yes 14	Drink to get "drunk" No 49	p
Drive under influence	1.08	1.10	1.00	0.369	1.19	1.00	0.042	1.36	1.00	0.001
Ride w/ impaired driver	1.05	1.06	1.00	0.467	1.11	1.00	0.010	1.21	1.00	0.008
Stop friend driving impaired	4.90	4.87	5.00	0.476	4.92	4.88	0.867	4.86	4.91	0.384

Summary of post-survey responses with 5=much more likely 4=more likely 3=no change 2=less likely and 1=much less likely. Comparisons are made between groups identified on the pre-survey.

Notes

Scientific Session III-B - Cox-Templeton Injury Prevention Competition
Location: Nelson Wolff Exhibit Hall A, Level 1

Paper #22
January 14, 2016
9:20 am

INJURY PREVENTION PROGRAMS AGAINST DISTRACTED DRIVING AMONG STUDENTS

Bellal Joseph, MD, Ansab A Haider, MD, Tahereh Orouji, Narong Kulvatunyou, MD*, Terence O'Keeffe, MD, MSPH*, Lynn Gries, Donald Green, MD, Gary A. Vercruysse, MD*, Rifat Latifi, MD*, Peter Rhee, MD, MPH*
The University of Arizona

Presenter: Bellal Joseph, MD

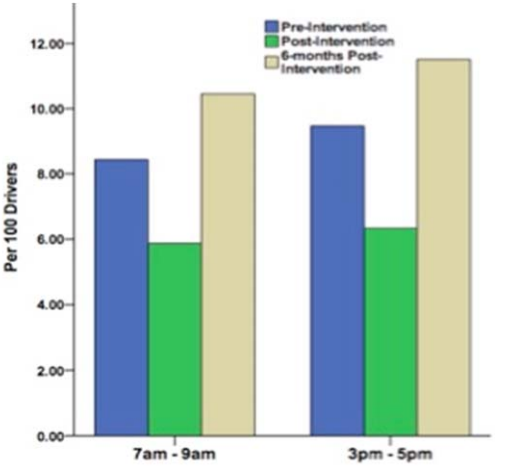
Discussant: Lisa Allee Barmark, MSW, LICSW, Boston Medical Center

Objectives: The aim of this study was to identify the incidence of distracted driving (DD) among students and to create awareness against DD. We hypothesized that DD is prevalent among students.

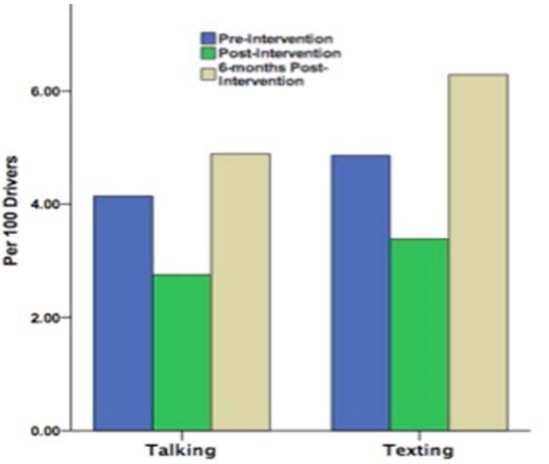
Methods: We performed a 4 phase prospective interventional study of university students at our campus. Phase one: 1 week pre-intervention observation, phase two: 1 week intervention, phase three: 1 week post-intervention observation, and phase 4: 1 week 6 month post-intervention observation. Intervention comprised of informative emails, pamphlets and banners in student union. Outcome measure was incidence of DD pre, post, and 6 months post intervention.

Results: A total of 47,764 observations (Pre: 14,844, Post: 17,939, 6-months Post: 14,981) were performed. The baseline incident of DD among students was 9.0 ± 1.2 per 100 drivers (Texting: 4.8 ± 1.7 per 100 drivers, Talking: 4.1 ± 1.1 per 100 drivers). There was a significant reduction in overall DD after intervention (9.0 ± 1.2 vs. 6.1 ± 1.7, $p<0.001$) however the incidence of DD returned to baseline at 6-month post-intervention and trended towards increase (9.0 ± 1.2 vs. 11.1 ± 8.4, $p=0.34$). There was a significant reduction in DD in each time interval of observation between the pre and post intervention **(Figure 1).** On sub-analysis, there was a significant decrease in talking (p=0.001) and texting (p=0.01) while driving post-intervention as compared to that of pre-intervention. **(Figure 2)**

Conclusions: There was 32% reduction in the incidence of distracted driving post-intervention however a single episode of intervention did not have a sustainable preventive effect on the DD and the incident increased and exceeded the baseline at 6-month follow up. Implementation of an effective injury prevention campaign with repeated boosters may reduce the incidence of distracted driving among the students.



Incidence of Distracted Driving



Notes

Scientific Session III-B - Cox-Templeton Injury Prevention Competition
Location: Nelson Wolff Exhibit Hall A, Level 1

Paper #23
January 14, 2016
9:40 am

A TARGETED HIGH SCHOOL SEAT BELT AWARENESS PROGRAM INCREASES SEAT BELT USAGE FOR ADOLESCENT DRIVERS

A. Britton Christmas, MD, FACS*, Peter E. Fischer, MD, MS*, Bradley Thomas, Ronald F. Sing, DO*, Janice Williams
Carolinas Medical Center

Presenter: A. Britton Christmas, MD, FACS

Discussant: Shannon M. Foster, MD, Reading Health System/University of Pennsylvania

Objectives: Seat belt (SB) use has been associated with decreased morbidity and mortality following motor vehicle crashes and is mandatory for drivers and front seat passengers in 34 states. At our trauma center, we discovered that 34% of adolescent MVC victims were unbelted which significantly differed from our observed 90% SB usage rate in the community. We undertook this study to assess a targeted SB intervention program at local high schools.

Methods: High schools were demographically matched and placed into either a control (CON) group or an intervention group (INT). Each school in the INT group received a standardized seatbelt awareness intervention program and chose additional intervention methods ranging from newsletter and social media to more personal interventions. During the 2013-2014 school year, SB usage was documented at school exits by two trained observers according to the North Carolina SB assessment form during pre-intervention (PRE) and post-intervention (POST) phases.

Results: Four CON schools were compared to 6 INT schools during the study period. Overall (68.3% vs. 70.2%), driver (78.5% vs. 78.8%), and passenger (57.3% vs. 60.8%) SB usage was similar between both CON and INT groups during PRE. Comparing PRE to POST, driver SB usage increased in INT (78.8% vs. 83%) but remained unchanged in the CON group (78.5% vs. 77.5%). No impact was observed on the SB usage of passengers. (Tables 1 & 2)

Conclusions: At our trauma center, we observed lower SB usage among adolescents compared to the observed community rate. Our SB intervention program targeting local high schools successfully increased driver SB usage at all INT schools compared to CON. No effect was observed on passenger SB use.

Table 1. Intervention (INT) Schools PRE vs. POST

	PRE			POST		
School	Driver SB	Passenger SB	Overall SB	Driver SB	Passenger SB	Overall SB
A	89%	64%	77%	93%	62%	78%
B	64%	25%	45%	70%	24%	47%
C	78%	71%	78%	85%	73%	79%
D	84%	71%	78%	88%	73%	81%
E	70%	62%	66%	74%	61%	68%
F	88%	72%	80%	89%	71%	80%
All INT	79%	61%	71%	83%	61%	72%

Table 2. Control (CON) Schools PRE vs. Post

	PRE			POST		
School	Driver SB	Passenger SB	Overall SB	Driver SB	Passenger SB	Overall SB
G	61%	42%	51%	64%	35%	50%
H	81%	58%	70%	74%	57%	66%
I	80%	61%	71%	79%	61%	70%
J	92%	69%	81%	93%	68%	81%
All CON	79%	57%	68%	78%	55%	66%

Notes

Scientific Session IV-A – Coagulation
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #24
January 15, 2016
8:00 am

TRAUMA PATIENTS ON NEW ORAL ANTICOAGULATION AGENTS HAVE LOWER MORTALITY THAN THOSE ON WARFARIN

Adrian A. Maung, MD*, Bishwajit Bhattacharya, MD*, Kevin M. Schuster, MD, MPH*,
Kimberly A. Davis, MD, MBA, FACS, FCCM*
Yale School of Medicine

Presenter: Adrian A. Maung, MD

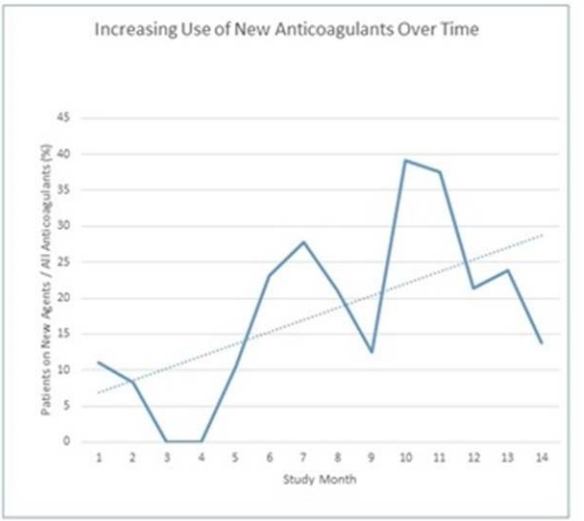
Discussant: Uzer Khan, MD, MBBS, West Virginia University

Objectives: Although anticoagulation with warfarin has been associated with increased risk of adverse outcomes after trauma, the effects of the new oral agents (NOA) such as dabigatran, apixaban, rivaroxaban are not yet well characterized.

Methods: A retrospective review of a Level 1 trauma center database identified all patients age ≥ 50 admitted after trauma during a 14 month period starting Sept 2013. Demographics, including pre-admission anticoagulation agents, injuries, hospital course and outcomes were abstracted from the EMR.

Results: Over the 14 month period, 1994 patients were admitted; 48 (2.4%) were anticoagulated with NOA and 227 (11.4%) with warfarin with a trend toward increasing utilization of the new agents compared to warfarin over that time period (Figure 1). Although comparable in age, gender, ISS and mechanism of injury (Table 1), patients anticoagulated with warfarin had a higher mortality (12.8%) compared to the NOA (6.25%) or the non-anticoagulated control group (6.05%). ($p < 0.001$) Patients on warfarin or NOA required admission to ICU or SDU more frequently than control patients. (43.6% and 50% vs. 36.2% respectively, $p=0.018$). There were no significant differences in RBC transfusions among the three groups but the warfarin group more often received prothrombin complex concentrate (13.2% vs. 8.3% and 0.1% respectively, $p < 0.001$) and FFP (26.0% vs. 4.2% and 1.9%, $p < 0.001$) The incidence of traumatic brain injury (TBI) was similar among the three groups. However, although it did not reach statistical significance, mortality in the TBI subset was highest in the warfarin group (23.6%) vs. the NOA group (10%) or the control group (13.1%) ($p=0.1$).

Conclusions: Although the experience with the new oral anticoagulation agents is still limited, patients on these agents appear to have lower mortality after traumatic injury than patients on warfarin.



	Warfarin (n = 227)	New Anticoagulants (n = 48)	Not Anticoagulated (n = 1719)	P
Age (years)	80.7 ± 9.7	79.1 ± 10.6	73.1 ± 13.9	0.001
Male Gender (%)	52.4	39.5	46.4	0.135
ISS	9.40 ± 6.69	10.54 ± 10.99	8.89 ± 6.71	0.116
TBI (%)	24.2	20.8	19.1	0.191
Length of Stay (days)	6.48 ± 6.91	7.46 ± 11.25	5.50 ± 7.69	0.05
Death (%)	12.8	6.3	6.1	0.001
ICU/SDU (%)	43.6	50.0	36.2	0.018
Surgery (%)	34.4	27.1	37.2	0.272
PRBC Transfusion (%)	18.9	16.7	15.7	0.471
# PRBC (Units)	2.79 ± 2.71	2.25 ± 1.67	2.70 ± 2.76	0.881
FFP Transfusion (%)	26.0	4.2	1.9	0.001
PCC (%)	13.2	8.3	0.1	0.001
Respiratory Failure (%)	11.9	18.8	9.7	0.077

Notes

Paper #25
January 15, 2016
8:20 am

INFLUENCES OF LIMITED RESUSCITATION WITH PLASMA OR PLASMA PROTEIN SOLUTIONS ON HEMOSTASIS AND SURVIVAL OF RABBITS WITH NON-COMPRESSIBLE HEMORRHAGE

Bijan S. Kheirabadi, PhD
US Army Institute of Surgical Research

Presenter: Bijan S. Kheirabadi, PhD

Discussant: Michael Cripps, MD, UT Southwestern/Parkland

Objectives: Prehospital resuscitation of combat casualties with a small volume of plasma or Hextend is military standard of care. We compared outcomes of this standard resuscitation using fresh plasma vs purified plasma protein or crystalloid in an uncontrolled hemorrhage model.

Methods: Anesthetized spontaneously breathing rabbits (3.3±0.1 kg) were instrumented and subjected to a splenic uncontrolled hemorrhage. Shocked rabbits (MAP<40 mmHg) were resuscitated at 15 min with Plasma-Lyte (PAL; 30 ml/kg), PAL+ fibrinogen (PAL+F; 30ml+100mg/kg), fresh rabbit plasma (PL; 15ml/kg), or 25% albumin (AL; 5 ml/kg); all given in two bolus IV injections (20 min apart) to achieve a MAP of 65 mmHg, n=8-9/gp. Animals were monitored 2 hrs or until death and blood loss measured (Table). Blood samples were analyzed for ABG, CBC, protein and coag tests. Data were analyzed statistically and expressed as mean ± SEM.

Results: There were no differences among gps in baseline measures, nor in initial blood loss (11.7±0.3 ml/kg) at 15 min. Twenty min after 2nd bolus fluid resuscitation when blood was sampled (Table), MAP was higher with AL than with crystalloids (PAL or PAL+F), but shock indices were not different. No differences were found in hemostatic effects of PL vs. AL. Fibrinogen addition to PAL increased clot strength but reduced clotting rate. AL resulted in the numerically lowest blood loss and highest survival outcomes (P<.05). Blood values and final outcomes are shown in Table.

Conclusions: Fibrinogen addition to a compatible crystalloid (given at 100 mg/kg dose) did not improve the outcomes in this model. Small volume resuscitation with 25% albumin solution increased hemodynamics and produced best survival outcomes at 1/3 volume of plasma. These outcomes are consistent with our previous finding using 5% albumin solution at a volume equal to plasma. The benefit of using plasma for resuscitation may be mostly due to its albumin component rather than its clotting proteins.

group (gp)	MAP mmHg	Base def (mM)	Lactate (mM)	Total protein g/dl	Albumin g/dL	Fibrinog mg/dL	TEG R-time (min)	TEG α angle	TEG MA (mm)	Blood Loss ml/kg	Survival rate	Survival time min
PAL	27±4	5.7±1.3	7.8±1.2	3.1±0.1	1.0±0.1	182±15	7.1±0.1	69±1	66±2	12.2±2.2	4/9	95±9
PAL+F	31±6	5.3±1.4	8.4±1.5	3.3±0.1	1.0±0.1	467±20*	8.9±0.6	60±2*	77±1*	13.4±2.5	3/8	94±10
PL	38±4	2.4±1.7	7.6±1.0	4.1±0.2*	1.3±0.1*	222±14	8.0±0.9	68±2	70±1	13.9±2.8	6/8	112±5
AL	51±6*	3.3±1.0	6.4±0.8	5.6±0.1*	4.1±0.1*	136±7	6.0±0.4*	67±1	62±1	10.9±1.8	8/8*	120±0*

(*P<.05 vs. crystalloids (PAL or PAL+F), *P<.05 vs all groups, °P<.05 vs PAL+F)

Table 1.Blood pressure (MAP), blood sample analysis and final outcomes of rabbits with uncontrolled hemorrhage after receiving limited fluid resuscitation

Notes

Scientific Session IV-A – Coagulation
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #26
January 15, 2016
8:40 am

SUBCUTANEOUS ADIPOSE TISSUE DRIVES POST INJURY HYPERCOAGULABILITY

Robert D. Winfield, MD*, Vincent Mellnick, MD, Isaiah Turnbull, Constatine Raptis, MD, Kelly Bochicchio, Philip C. Spinella, MD, FCCM*, Grant V. Bochicchio, MD, MPH*
Washington University School of Medicine

Presenter: Robert D. Winfield, MD - @rwinfield11

Discussant: Rachael Callcut, MD, MSPH, University of California-San Francisco

Objectives: Obesity is associated with a hypercoagulable state at baseline and following injury. Location of adipose deposition may influence the type of thrombotic event, with visceral adipose tissue (VAT) associated with arterial, and subcutaneous adipose (SAT) predisposing to venous, thrombosis. We sought to determine whether adipose tissue amount and location correlated with measures of coagulation.

Methods: All adult Level I Trauma Activations at our institution between January and August 2013 who underwent admission abdominal CT scan and had admission ROTEM measurements were included. Patients were excluded for history of anticoagulant use and known coagulopathy/hypercoagulable state. Admission CT was used to obtain cross-sectional VAT and SAT areas at the umbilicus utilizing a novel software system; VAT and SAT measurements were associated with markers of coagulation utilizing Spearman's correlation and multiple linear regression with significance set at $p<0.05$.

Results: 138 patients met inclusion and exclusion criteria. 71% of patients sustained blunt injury, 83% were male, median age was 34 years, 24% were obese or morbidly obese, and median ISS was 14. 12% of patients had acute DVT or PE during hospitalization. SAT correlated negatively with PT, INR, and positively with platelet count (PLT); VAT correlated only with PLT. VAT and SAT correlated negatively with clot formation time (CFT) and positively with TEM fibrinogen (TF), alpha angle (AA), and maximum clot firmness; stronger correlations and greater significance were seen between SAT and these measures. Multiple linear regression confirmed significant relationships between SAT and TF, AA, and CFT; VAT only showed a significant relationship with PLT (Table 1).

Conclusions: Increased adipose tissue correlates with relative hypercoagulability following trauma. SAT shows a stronger relationship with functional measures of coagulation, suggesting that SAT may be associated with hemorrhage resistance and hypercoagulability after injury.

Table 1. Linear Regression Relationship between Adipose Tissue and Measures of Coagulation

	Subcutaneous Adipose Tissue		Visceral Adipose Tissue	
	Odds Ratio	p-value	Odds Ratio	p-value
Prothrombin Time	0 (-0.004, 0.003)	0.957	-0.007 (-0.015, 0.003)	0.097
INR	0 (0, 0)	0.903	-0.001 (-0.001, 0)	0.081
Platelet Count	0.079 (-0.008, 0.165)	0.075	0.223 (0.022, 0.425)*	0.030
TEM Fibrinogen	0.018 (0.010,0.026)*	<0.001	-0.007 (-0.025,0.011)	0.459
Clot formation Time	-0.067 (-0.131, -0.004)*	0.039	-0.024 (-0.174, 0.126)	0.750
Alpha-angle	0.010 (0, 0.019)*	0.045	0.009 (-0.012, 0.031)	0.394
Maximum Clot Firmness	0.009 (-0.002, 0.020)	0.122	0.019 (-0.007, 0.046)	0.151

Data are presented as OR (95% CI), * indicates p-value <0.05

Notes

Scientific Session IV-A – Coagulation
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #27
January 15, 2016
9:00 am

TRAUMA-INDUCED COAGULOPATHY IN A CRITICALLY INJURED PEDIATRIC POPULATION - DEFINITION, CONTRIBUTING FACTORS, AND IMPACT ON OUTCOMES

Christine M. Leeper, MD, Matthew Kutcher, MD, Isam Nasr, Christine J. McKenna, MSN*, Jason L. Sperry, MD, MPH*, Barbara A. Gaines, MD*
University of Pittsburgh Medical Center

Presenter: Christine M. Leeper, MD

Discussant: Robert Letton, Jr., MD, The Children's Hospital at OU Medical Center

Objectives: Trauma-induced coagulopathy is a well-described entity in adults. Children also develop coagulopathy after serious injury, however literature in pediatric patients is lacking. We seek to characterize the definition, contributors and impact of trauma-induced coagulopathy in a pediatric population.

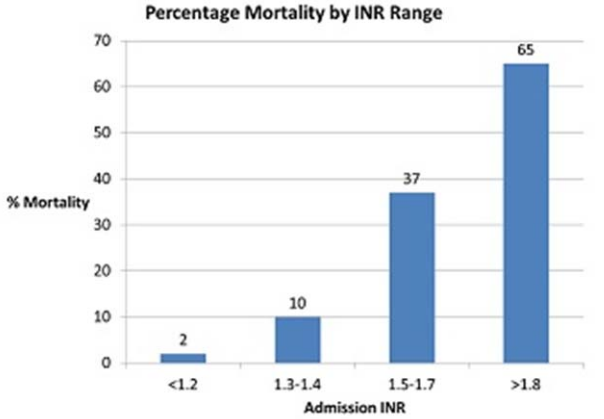
Methods: We retrospectively reviewed trauma ICU admissions age 0-17 in a level 1 pediatric trauma center from 2005-2014. Variables of interest included demographics, labs, vital signs, injury severity and mechanism, transfusion requirement and mortality. We performed univariate analysis with Student t-test, Wilcoxon rank-sum, Fisher exact and logistic regression modeling using BIC-based forward selection criteria. $p<0.05$ was significant.

Results: 776 patients met criteria - 29.2% (n=227) had admission INR ≥1.3, and 13.3% (n=103) had admission INR ≥1.5. Mortality rate was 11.1% (n=86) and increased proportionately with INR (Figure 1). The incidence of mortality was clinically meaningful in coagulopathic patients using a cutoff of INR ≥1.3. Coagulopathy was the strongest independent predictor of mortality with odds ratio 3.77 ($p<0.001$, ROC=0.9)(Figure 2). As expected, coagulopathic patients more likely required transfusion within 6 hours (60.8% vs. 7.5%) with OR=10.95 even when adjusting for ISS, acidosis and hypotension ($p<0.001$). Predictors of coagulopathy after controlling for hypotension, hypothermia and acidosis were GCS<8, penetrating mechanism and ISS.

Conclusions: Coagulopathy, defined as INR ≥1.3, is common in severely injured pediatric patients and is the strongest independent predictor of mortality. GCS<8, injury severity and penetrating mechanism are associated with admission coagulopathy. Additional research is needed to clarify the precise nature of this coagulation dysregulation, as well as the impact of early identification and intervention for coagulopathy.

Predictors of Mortality				
	INR ≥ 1.3		INR ≥ 1.5	
	Odds Ratio (95% Confidence Interval)	P value	Odds Ratio (95% Confidence Interval)	P value
Coagulopathy	3.77 (1.95 – 7.32)	*P<0.001	4.78 (2.47 – 9.26)	*P<0.001
Hypotension	3.45 (1.33 – 9.02)	*P=0.011	3.54 (1.33 – 9.40)	*P=0.011
Hypothermia	3.73 (1.96 – 7.07)	*P<0.001	3.70 (1.93 – 7.11)	*P<0.001
Acidosis	2.38 (1.29 - 4.39)	*P=0.005	2.15 (1.14 – 4.03)	*P=0.017
Injury Severity Score	1.06 (1.03 - 1.08)	*P<0.001	1.06 (1.03 - 1.09)	*P<0.001
Traumatic Brain Injury	3.34 (1.45 – 7.66)	*P<0.001	3.70 (1.57 – 8.69)	*P=0.003

Independent Predictors of Mortality in Critically-Injured Pediatric ICU Trauma Admissions - Logistic Regression Model



Percent Mortality by Admission INR Ranges

Notes

Scientific Session IV-A – Coagulation
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #28
January 15, 2016
9:20 am

HOW LONG SHOULD WE FEAR? LONG-TERM RISK OF VENOUS THROMBOEMBOLISM IN PATIENTS WITH TRAUMATIC BRAIN INJURY

Olubode A. Olufajo, MD, MPH, Brian Yorkgitis, PA-C, DO, David Metcalfe, LLB MBChB, Arturo J. Rios Diaz, MD, Adil H. Haider, MD, MPH*, Joaquim M. Havens, MD*, Zara Cooper, MD, MSc*, Edward Kelly, MD*, Jonathan D. Gates, MD, MBA*, Ali Salim, MD*
Brigham and Women's Hospital

Presenter: Olubode A. Olufajo, MD, MPH

Discussant: Sherry Sixta, MD, Christiana Care Health System

Objectives: To determine how long the risk of Venous Thromboembolism (VTE) persists in patients that have traumatic brain injury (TBI) and to identify associated factors.

Methods: Patients 18 years and older with ICD 9-CM diagnoses of isolated TBI (Head Abbreviated Injury Scale (AIS) ≥3 and AIS <3 for all other body regions) were identified in the California State Inpatient Database (2007-2010). Patient and admission (injury severity score, length of stay, complication rate, discharge disposition) characteristics were assessed. Hospital factors (teaching status, trauma center verification, bed size) were extracted from the American Hospital Association database. Patients that developed VTE during the index admission and after discharge were determined. Multivariate logistic regression models were used to assess the associated risk factors for VTE post-discharge.

Results: There were 50,132 patients with isolated TBI identified. The incidence of VTE was 1.26% during the index admission and the cumulative incidence of VTE involving hospitalization within 1 year of injury was 2.76%. The Table and Figure show the cumulative incidence of VTE over time for each AIS category. The major risk factors for VTE 1 year after discharge (not including the index admission) were age >64 years vs. 18 – 44 years [Adjusted Odds Ratio: 2.97 (95% Confidence Interval: 2.00 – 4.42)], discharge to a skilled nursing facility vs. home [2.77 (1.95 – 3.93)], hospital length of stay > 7 days vs. ≤ 3 days [2.00 (1.55 – 2.59)], and Charlson score ≥ 2 [1.29 (1.08 – 1.55)].

Conclusions: The risk of VTE persists long after discharge in a significant proportion of patients with TBI. Demographic and admission characteristics of patients play significant roles in the risk of VTE after discharge. These results highlight the need for sustained surveillance and preventive measures among TBI patients at increased risk for long-term VTE.

Time Period	Cumulative incidence of VTE, %			
	Overall population	Head AIS 3 (N= 24,595)	Head AIS 4 (N = 24,511)	Head AIS 5 (N = 1,026)
During index admission	1.26	1.17	1.34	1.30
30 days after injury	1.82	1.60	2.07	1.30
60 days after injury	2.14	1.81	2.51	1.65
90 days after injury	2.25	1.88	2.66	1.65
180 days after injury	2.47	2.01	2.98	1.65
360 days after injury	2.76	2.23	3.10	1.75
	In-hospital Mortality			
1 year mortality	12.15	8.62	12.89	76.48

AIS – Abbreviated Injury Scale

Table: Cumulative Incidence of Venous Thromboembolism in Traumatic Brain Injury Patients

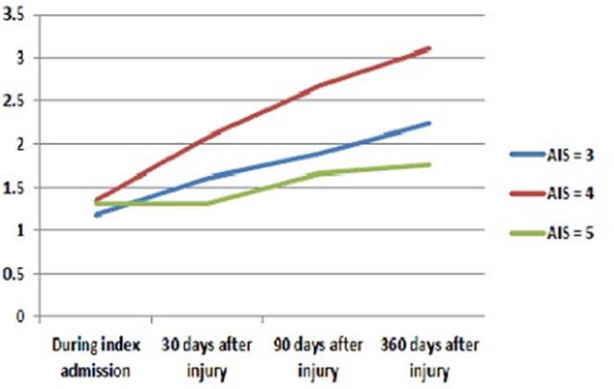


Figure: Graph showing risk of Venous Thromboembolism during One Year after Injury

Notes

Scientific Session IV-A – Coagulation
Location: Cibolo Canyon Ballroom 1-6, Level 2

Paper #29
January 15, 2016
9:40 am

UNIVERSAL WHOLE BLOOD FOR TRAUMATIC HEMORRHAGIC SHOCK: A PILOT STUDY TO DETERMINE SAFETY

Alan Murdock, MD, Louis H. Alarcon, MD*,
Jason L. Sperry, MD, MPH*, Darrell Triulzi, Mark Yazer
University of Pittsburgh Medical Center

Presenter: Alan Murdock, MD

Discussant: Kyle Remick, MD, US Army Medical Research & Materiel Command,
Ft. Detrick/Uniformed Services of the Health Sciences

Objectives: Whole blood (WB) has been extensively transfused by the military. WB can be either type-specific or "universal" low titer type O (UWB). UWB provides a simplified package for trauma resuscitation. We aimed to show that there was no significant increased risk of adverse events following UWB administration.

Methods: UWB was collected from O+ male donors using Terumo Imuflex system with platelet sparing leukocyte reducing filter. UWB with titers of anti-A and B < 1:100 was stored in the ED at 4^{o} C for up to 10 days. Up to 2 UWBs were transfused to male trauma patients with hypotension and suspected hemorrhage. UWB was followed with 1:1:1 component therapy as clinically indicated. UWB group was compared to cohort group (Component) who did not receive UWB in the 6 months prior to "change of practice" approach.

Results: Thus far 31 male trauma patients have received 51 UWBs. Table 1 compares HR, BP, ISS, and mortality for both groups. There were 10/24 non-group O UWB recipients who received ABO mismatched PLTs capable of causing hemolysis; the mean number of mismatched PLTs was 9.5±6.9 per patient; the mean total number of mismatched products (PLT+WB) was 11.3±6.8 per patient. Mean haptogloblin for UWB recipients was 13±7 mg/dl, which was consistent with reported literature for trauma patients who received type-specific PRBCs. No transfusion reactions were reported following UWB. Mean age of UWB was 7.9±2.8 days. Mean 24 hr blood products per patient: UWB 1.7±0.6 units; PRBC 9.7±12.5 units; plasma 10.8±15.9 units; platelets 5.9±9.5 units; cryoprecipitate 5.0±9.9 units.

Conclusions: Although the initial safety determination study is still in progress there does not appear to be a significantly increased risk of adverse events from transfusing up to 2 UWBs per trauma patient. Once we have completed the initial pilot, we will increase the number of UWB units transfused to assess morbidity and mortality in patients treated with WB compared to standard component therapy.

	UWB N=31	Component N=69
Initial BP	97 ± 34	104 ± 47
Initial HR	108 ± 40	95 ± 38
ISS	20 ± 12	19 ± 15
Mortality	29%	28%

Table 1. Comparison of UWB group and Component group.

Notes

Scientific Session IV-B – Emergency General Surgery
Location: Nelson Wolff Exhibit Hall A, Level 1

Paper #30
January 15, 2016
8:00 am

SURGICAL RESCUE: THE NEXT PILLAR OF ACUTE CARE SURGERY

Matthew E. Kutcher, MD, Samuel Zolin, Marcus Hoffman, Anisleidy Fombona, Tianhua Zhou, Robert Becher, Raquel M. Forsythe, MD*, Timothy Billiar, MD, Jason L. Sperry, MD, MPH*, Andrew B. Peitzman, MD*
University of Pittsburgh Medical Center

Presenter: Matthew E. Kutcher, MD

Discussant: Joshua Hazelton, DO, Cooper University Hospital

Objectives: The field of acute care surgery (ACS) traditionally includes trauma, emergency general surgery, and critical care. We here sought to describe the additional vital role of 'surgical rescue' to the practice of ACS.

Methods: A prospective ACS database at an urban academic medical center was screened for procedural complications by ICD-9 code and chart review. Complications were coded as 'internal' (related to a procedure performed by ACS), 'institutional' (related to a procedure performed by another service), or 'regional' (related to a procedure performed at another institution).

Results: Of 2,301 ACS patients screened from 1/2013 to 5/2014, 489 (19.9%) had procedural complications. Surgical rescue patients were older, more obese, and had more comorbidities than other ACS patients (all $p<0.05$). Hemoglobin and albumin were lower, while peak creatinine and lactate were higher (all $p<0.04$). 88% of complications were secondary to an operation, and 12% to an interventional or endoscopic procedure. Interventions for rescue included critical care (53%), mechanical ventilation (39%), interventional or endoscopic procedures (68%), and operation (83%). Exploring complication origin, 26% were internal, 49% institutional, and 25% regional. Institutional rescue patients had the highest peak creatinine and lactate, required more critical care and mechanical ventilation, had longer hospital and ICU stay, and higher 90-day and 1-year mortality (all $p<0.03$). Internal rescue patients required more interventional procedures ($p<0.01$), while regional patients required more operative intervention ($p=0.01$).

Conclusions: In addition to the provision of trauma, emergency surgical, and critical care, the acute care surgeon has a crucial role in the management of surgical complications. Surgical rescue is of vital importance to other surgical services as well as to regional hospital systems, constituting a key pillar of Acute Care Surgery.

	Yes (n=426)	No (n=1,872)	P-value
Hospital length of stay	11 (5-22)	5 (2-13)	<0.01
ICU length of stay	1 (0-5)	0	<0.01
Mechanical ventilation	38%	2%	<0.01
Tracheostomy	12%	1%	<0.02
Discharge to home	54%	63%	<0.02
In-hospital mortality	9%	7%	0.06
30-day mortality	13%	10%	0.05
90-day mortality	17%	13%	0.04
1-year mortality	24%	18%	0.01

Table 1. Outcomes of acute care surgery patients with procedural complications.

	Internal (n=110)	Institutional (n=210)	Regional (n=110)	P-value
Hospital length of stay	6 (3-16)	15 (6-29)	9 (5-17)	<0.01
ICU length of stay	0 (0-2)	2 (0-8)	0 (0-4)	<0.01
Mechanical ventilation	22%	50%	34%	<0.01
Tracheostomy	5%	18%	7%	<0.01
Discharge to home	63%	46%	62%	<0.01
In-hospital mortality	7%	12%	7%	0.33
30-day mortality	10%	16%	10%	0.18
90-day mortality	12%	22%	13%	0.03
1-year mortality	17%	29%	21%	0.04

Table 2. Outcomes of surgical rescue by complication type.

Notes

Scientific Session IV-B – Emergency General Surgery
Location: Nelson Wolff Exhibit Hall A, Level 1

Paper #31
January 15, 2016
8:20 am

EMERGENCY GENERAL SURGERY SPECIFIC FRAILTY INDEX: A VALIDATION STUDY

Tahereh Orouji Jokar, Kareem Ibraheem, Peter Rhee, MD, MPH*,
Narong Kulvatunyou, MD*, Andrew L. Tang, MD*, Rifat Latifi, MD*,
Randall S. Friese, MD*, Mindy Fain, MD, Jane Mohler, Bellal Joseph, MD
The University of Arizona

Presenter: Tahereh Orouji Jokar

Discussant: Eric Bradburn, DO, MS, VTC-Carilion Clinic

Objectives: Assessment of operative risk in geriatric patients undergoing emergency general surgery (EGS) is challenging. Frailty is an established measure for risk assessment in surgical cases. The aim of our study was to validate a modified 15 variable emergency general surgery specific frailty index (EGSFI).

Methods: We prospectively collected geriatric (age > 65) emergency general surgery patients for 1-year. Post-operative complications were collected. Frailty Index was calculated for 200 patients based on their pre-admission condition using 50-variable modified Rockwood Frailty Index (FI). EGSFI was developed based on the regression model for complications and the most significant factors in FI. We validated our results using 60 patients. ROC curve analysis was performed. Patients with EGSFI > 0.325 were defined as Frail.

Results: A total of 260 patients (200 developing, 60 Validation) were enrolled in this study. Mean age was 73 Â± 11, and 30% developed complications. Mean EGSFI was 0.22 Â± 0.16. Most common complications were wound infection (14%), sepsis (7%), and pneumonia (6%).

In validation cohort, Frail patients were more likely to have post-operative complications (61.5% vs. 38%; p=0.012) compared to non-frail patients. Frail status based on EGSFI was a significant predictor of post-operative complications (OR=7.3, 95%CI = 1.7 – 19.8; p=0.006). Age was not a predictor for post-operative complications (OR=0.96, 95%CI = 0.91 – 1.02; p=0.20).
On ROC curve analysis EGSFI was a reliable predictor for post-operative complications (AUC=0.725; p=0.008).

Conclusions: The 15 variable EGSFI is an independent predictor of post-operative complications in geriatric emergency general surgery patients. EGSFI is an effective tool that can aid clinicians in post-operative management of geriatric emergency general surgery patients.

Notes

Scientific Session IV-B – Emergency General Surgery
Location: Nelson Wolff Exhibit Hall A, Level 1

Paper #32
January 15, 2016
8:40 am

GO FOR THE JUGULAR: ASSESSING VOLUME RESPONSIVENESS IN CRITICALLY ILL SURGICAL PATIENTS

Sarah B. Murthi, MD, Daniel Haase, Jacob Glaser, MD*, Hegang Chen, PhD,
Raymond Fang, MD, FACS*, Stephen Biederman, Cassandra Cardarelli,
Matthew Vasquez, Thomas M. Scalea, MD, FACS, FCCM*
University of Maryland

Presenter: Sarah B. Murthi, MD

Discussant: Brian Williams, MD, UT Southwestern Medical Center

Objectives: Ultrasonographic (US) measures of volume responsiveness (VR) could be affected by surgery, trauma, or mode of ventilation. The objective of this study is to compare the accuracy of four US measures in prediction of VR in critically ill surgical patients.

Methods: This is a prospective observational study in critically ill patients receiving fluid for clinical indications. A focused rapid echocardiogram (FREE) was performed before and after the bolus and the percent increase in stroke volume (SV) measured. The Inferior Vena Cava respiratory variation (Î”r IVC), stroke volume respiratory variation (Î”r SVV), stroke volume passive leg raise variation (Î”plr SVV), and a new measure, positional IJ change (Î” p IJ) were assessed prior to the bolus. The Î” p IJ assesses change in the diameter of the IJ between 0 and 90Âº (flat and head-up). The area of the receiver operating curve was used to determine threshold values for each measure in prediction of > 10% in SV (+VR).

Results: From 11/15/13 through 06/30/15, 159 patients completed the study. The majority were intubated 90%, 67% were trauma and 28% other surgical patents. Analysis of the first 50 patients demonstrated that Î” plr SVV could not be reliably assessed with echo and the measure was abandoned. The remaining measurements were associated with +VR. The ROC was best for Î” p IJ (0.93), followed by Î”r SVV (0.75) and Î”r IVC (0.67), with sensitivities and specificities of 93 and 89%, 81 and 64%, 69 and 66% respectively. When Î” p IJ and Î”r SVV were combined the ROC increased to (0.95). Analysis of the remaining patients is ongoing.

Conclusions: Ultrasound predicts VR. Positional IJ change is easy to perform, and is the most accurate measure. Ultrasound should be considered an essential part of volume assessment in critically ill patients. Studies on the impact of ultrasound-directed management on outcome are warranted.

Notes

Paper #33
January 15, 2016
9:00 am

ACUTE CARE SURGERY AND EMERGENCY GENERAL SURGERY: ADDITION BY SUBTRACTION

Brandon Bruns, MD, FACS*, Ronald B. Tesoriero, MD*,
Mayur Narayan, MD, MPH, MBA, FACS, FICS*,
Lindsay O'Meara, Margaret H Lauerman, MD*, Barbara Eaton,
Thomas M. Scalea, MD, FACS, FCCM*, Jose J. Diaz, MD*
R Adams Cowley Shock Trauma Center, University of Maryland School of Medicine

Presenter: Brandon Bruns, MD, FACS

Discussant: Stephen Barnes, MD, University of Missouri Department of Surgery

Objectives: The formation of Acute Care Surgery (ACS) leads to decreased time to treatment and improved outcomes for emergency general surgery (EGS) patients. However, minimal work has focused on the ideal care delivery system and team structure. We hypothesize that the implementation of a dedicated Emergency General Surgery (EGS) team (separate from trauma and surgical critical care), with EGS-specific protocols and dedicated (operating room) OR time, will increase productivity and improve mortality.

Methods: This is a retrospective review of financial and EGS registry data from fiscal year (FY) 12 to FY15. Data are from an academic, university-based EGS team composed of 2 ACS attendings, nurse practitioners (NPs), residents, and a fellow. In FY12, processes were implemented to standardize: paging of consults, patient signout with attending participation, clinical/billing protocols, OR availability, and quality improvement. Outcomes included RVUs, surgical case volume, charges/payments, and number of patient encounters. The secondary outcome was mortality. Chi-square test was used to compare mortality and $p<0.05$ was considered significant.

Results: Total patient encounters increased from 6,723 in FY12 to 8,193 in FY15 (+22%). RVUs increased from 18,422 in FY12 to 23,198 in FY15 (+26%). Charges increased 61% and payments increased 36% from FY12 to FY15 **(TABLE)**. Charges per encounter increased from $461 in FY12 to $602 in FY15 (+130%). Additionally, both inpatient and outpatient surgical case loads increased **(TABLE)**. Mortality remained stable throughout the study period (FYs 12-4.5%, 13-5.2%, 14-5.3%, 15-3.2%, $p=0.183$).

Conclusions: Implementation of dedicated OR time, defined EGS team structure, practice protocols, and active attending/NP participation, has led to increased case volume, patients seen, and revenue, while mortality remained unchanged. Further study is necessary to establish the translatability of this data to other systems.

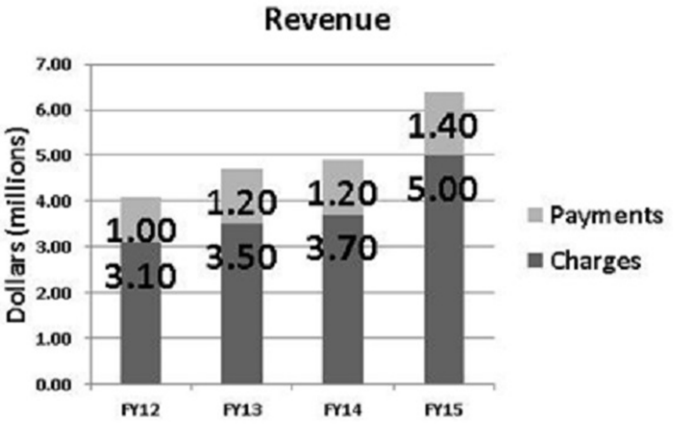


Table 1. Fiscal year (FY)12 - FY15 charges and payments collected.

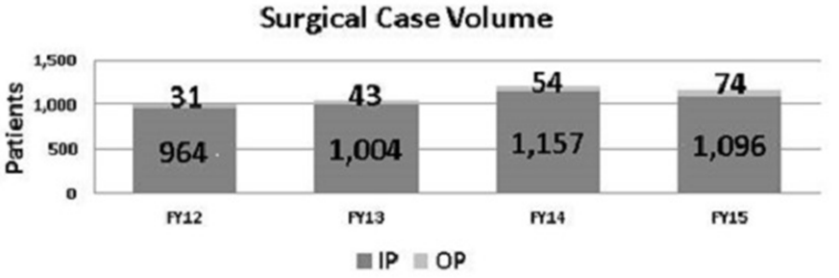


Table 2. Fiscal year (FY)12 - FY15 inpatient and outpatient surgical case volume.

Notes

Scientific Session IV-B – Emergency General Surgery
Location: Nelson Wolff Exhibit Hall A, Level 1

Paper #34
January 15, 2016
9:20 am

THE TRANSFORMING POWER OF EARLY CAREER ACUTE CARE SURGERY RESEARCH SCHOLARSHIPS ON ACADEMIC PRODUCTIVITY

Ben L. Zarzaur, MD, MPH*, Nakul Valsangkar, MD, Paul Martin,
David V. Feliciano, MD, FACS*, Grace S. Rozycki, MD, MBA, FACS*, Leonidas Koniaris
Indiana University

Presenter: Ben L. Zarzaur, MD, MPH

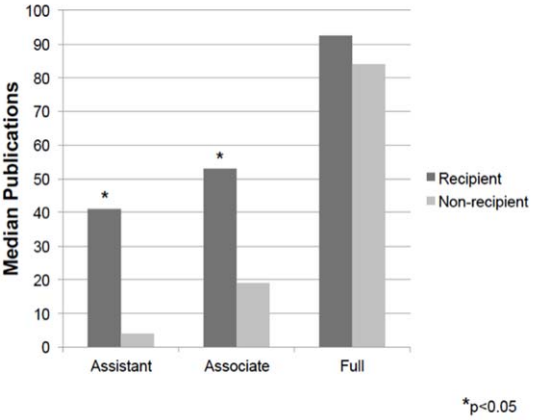
Discussant: Martin Zielinski, MD, Mayo Clinic

Objectives: Over 75% of respondents to an Eastern Association for the Surgery of Trauma (EAST) survey felt that barriers to research had increased and that acute care surgeon (ACS) academic productivity had decreased. Recent data confirm this impression and show lower academic productivity of junior ACS faculty compared to peers in other general surgical fields. The purpose of this study was to determine if early career ACS research scholarships are associated with improved ACS academic productivity.

Methods: Faculty data at the top 55 National Institutes of Health (NIH) funded departments of surgery (TOP55) was obtained using SCOPUS, NIH, department and professional society databases. Academic productivity was measured using total publications (PUBS), citations and the h-index. Scholarship recipients from the American Association for the Surgery of Trauma (AAST) and EAST were identified (RECIPIENTS).

Results: 4,101 surgical faculty (8.3% ACS) in TOP55 and 85 RECIPIENTS were identified. After merging, 34 RECIPIENTS (40%) were current faculty at a TOP 55 and 24 of those (71%) were ACS faculty. RECIPIENTS had higher median PUBS compared to NON-RECIPIENTS at assistant and associate ranks, but not at full professor rank (Figure 1). For all ranks, RECIPIENTS were more likely to have NIH funding compared to NON-RECIPIENTS (33% vs 11% $p<0.05$). On multivariable analysis, only NIH funding was associated with increased PUBS with an average of 89 more publications over a career ($p<0.05$). Citation and h-index findings were similar.

Conclusions: Research scholarships granted by ACS professional organizations remain largely among ACS faculty in TOP 55. Among junior ACS faculty, RECIPIENTS are associated with increased academic productivity and NIH funding. To fill the academic productivity gap among junior ACS, professional organizations should consider increasing research funding scholarships for promising investigators



Median Publications for Acute Care Surgeon Scholarship Recipients and Non-Recipients by Academic Rank

Notes

Scientific Session IV-B – Emergency General Surgery
Location: Nelson Wolff Exhibit Hall A, Level 1

Paper #35
January 15, 2016
9:40 am

STRESS AMONG SURGICAL ATTENDINGS AND TRAINEES: A QUANTITATIVE ASSESSMENT DURING TRAUMA ACTIVATION AND EMERGENCY SURGERIES

Bellal Joseph, MD, Tianyi Swartz, Peter Rhee, MD, MPH*, Saman Parvaneh, Bardiya Zangbar, MD, Narong Kulvatunyou, MD*, Andrew L. Tang, MD*, Gary A. Vercruysse, MD*, Jane Mohler, Bijan Najafi
The University of Arizona

Presenter: Bellal Joseph, MD

Discussant: Natasha Keric, MD, Banner University Medical Center Phoenix

Objectives: The aim of our study was to assess the level of stress using subjective data and objective heart rate variability (HRV) among attending surgeons (AS),junior (JR) (PGY2/PGY3), and senior (SR) (PGY5/PGY6) residents during trauma activation and emergency surgery.

Methods: We performed a prospective study enrolling participants over eight 24-hour calls in our Level-1 trauma center. Stress was assessed based on decrease in heart rate variability (HRV), which was recorded using body worn sensors continuously. Stress was defined as HRV below 85% of baseline HRV. We collected subjective data using the State-Trait Anxiety Inventory (STAI) and NASA Task Load Index (NTLI) for each participant during calls. Three groups (AS,JR,SR) were compared for duration of different stress levels through trauma activation and emergency surgery.

Results: A total of 22 participants (AS: 8, JR: 7, SR:7) were evaluated over 192 hours, which included 33 trauma activations and 50 emergency surgeries. Stress level increased during trauma activations and operations regardless of level of training. AS were stressed on average 13% of the time in trauma activations. Residents' stress-levels were both higher and lasted longer for both trauma activations (69% vs. 27%; p=0.001) and surgeries (81% vs. 47%; p=0.001) compared to AS. When comparing SR to JR, there was no difference in overall stress during trauma activations (71% vs. 68%; p=0.8) or emergency surgeries (p=0.4). There was no correlation between objectively measured stress level and subjectively measured stress using STAI(R^2=0.166; p=0.01) and NTLI(R^2=0.127; p=0.02) among surgeons or residents.

Conclusions: Surgeon wellness is a significant concern and this study provides empirical evidence that trauma and acute care surgeons encounter stress and fail to recognize it. Increasing surgeons' awareness to stress may be an important element of training and practice.

Notes

Color Sheet

Color Sheet

Quick Shots Parallel Session I
Location: Cibolo Canyon Ballroom 1-6, Level 2

Quick Shot #1
January 13, 2016
1:00 pm

MASSIVE TRANSFUSION IN NON-TRAUMA SURGICAL PATIENTS: HOW TO DEFINE IT AND WHAT IS THE ROLE OF BALANCED TRANSFUSION?

Stephanie F. Polites, MD, Asad Choudhry, Donald H. Jenkins, MD*,
James Stubbs, Martin D. Zielinski, MD, FACS*
Mayo Clinic

Presenter: Stephanie F. Polites, MD

Discussant: Amy Makely, MD, University of Cincinnati

Objectives: Balanced transfusion (BT) is beneficial in trauma patients who require massive transfusion (MT). It is unknown if these benefits extend to non-trauma surgical (NT) patients, however, as MT has not been clearly defined in this population. We compared NT patients receiving MT who were transfused platelet:pRBC or plasma:pRBC ratios of at least 1: 2 in 24 hours (BT) to those who were not (unbalanced transfusion; UT) using the MT definitions of ≥ 3 units pRBCs in 60 minutes and ≥10 units in 24 hours found in the trauma literature.

Methods: Review of all NT patients who were transfused ≥ 3 units pRBCs in 60 minutes from 2010 – 2013 was performed and ratios of platelet:pRBC and plasma:pRBC transfusion in 24 hours were calculated. Their 30 day mortality was determined and compared to the subset of patients who received ≥10 units in 24 hours. Patients who underwent cardiac surgery were excluded.

Results: We identified 1023 NT patients who received who received ≥ 3 units of pRBCs in 60 minutes. Overall mortality was 8.8%. The subset of patients who received ≥10 units in 24 hours (n=248) had a mortality rate of 13.3%. Mortality was similar between patients who received BT and UT regardless of MT definition (Table). The exception was BT of plasma:pRBC in patients who received ≥ 3 units pRBCs in 60 minutes; this had greater mortality compared to UT patients (13.2 vs 6.6%, p<.001).

Conclusions: Mortality of NT patients receiving MT was lower than that reported in the trauma literature regardless of MT definition. This necessitates a more conservative MT definition with higher pRBC volume requirements ifor NT patients so that ideal transfusion ratios can be further studied. Using current trauma literature definitions of MT, our data do not support a survival benefit to BT in NT patients.

Table: Mortality of Unbalanced vs Balanced Transfusion by Massive Transfusion Definition						
Massive Transfusion pRBC definition	plasma:pRBC			platelet:pRBC		
	BT	UT	*p* value	BT	UT	*p* value
≥3 units in 60 minutes	13.2%	6.6%	<.001	13.3%	8.4%	.15
≥10 units in 24 hours	15.8%	11.0%	.35	8.3%	14.3%	.55

BT, balanced transfusion; UT, unbalanced transfusion

Notes

Quick Shots Parallel Session I
Location: Cibolo Canyon Ballroom 1-6, Level 2

Quick Shot #2
January 13, 2016
1:06 pm

POSITIVE IMPACT OF A DESIGNATED DISCHARGE TEAM

James M. Bardes, MD*, Uzer Khan, MD, MBBS*, Jennifer Christine Knight, MD*, Jorge Con, MD*, Gregory P. Schaefer, DO, FACS*, Nicole Cornell, Alison M. Wilson, MD*
West Virginia University

Presenter: James M. Bardes, MD

Discussant: Cynthia Talley, MD, University of Kentucky

Objectives: Evaluate the impact on length of stay and discharge from the hospital by noon after the implementation of standardized discharge process and utilization of a separate discharge team. The discharge team was composed of faculty and a mid-level provider.

Methods: Retrospective review of the trauma database and hospital records at a University Level 1 trauma center. Records were reviewed for 2 years pre (2008-9), and two years post (2011-12), implementation of the discharge team. Discharge time was defined as the time the patient left the facility.

Results: 3118 patients were discharged in the pre period, and 3982 in the post. 26.1% of patients were discharged before noon in the pre period, this increased to 51.2% post implementation ($p<.0001$). Mean length of stay decreased from 4.6 to 3.9 days ($p=.0003$). When controlling for ISS ($p<.0001$) or patient age ($p<.0001$), there was still an increase in patient discharges by noon. In the pre period 25% of patients discharged to home left by noon, and 29% of patients discharged to other facilities were discharged by noon. In the post period the home discharge increased to 53% and those discharged to other facilities increased to 47%. This improvement was statistically significant ($p<.0001$) for both groups. The decrease in length of stay and discharge by noon resulted in a hospital direct cost savings of $4 million over 2 years. Patient charges were reduced by $14 million over the same time period.

Conclusions: Standardized discharge processes and utilization of a separate discharge team significantly increased the discharged by noon rate at a University Level 1 trauma center. This improvement was maintained when controlling for ISS, age and final discharge disposition. Significant savings were evident in both charges to the patient and direct costs to the facility. The utilization of a discharge team should be considered at similar facilities.

Notes

Quick Shots Parallel Session I
Location: Cibolo Canyon Ballroom 1-6, Level 2

Quick Shot #3
January 13, 2016
1:12 pm

POST-OPERATIVE RESUSCITATION OF ELECTIVE SURGERY PATIENTS IN THE SURGICAL INTENSIVE CARE UNIT

Madhu Subramanian, MD, Erica I Hodgman, MD, Zuhdi Abdo, Natalie Provenzale, Carol Hirschkorn, Brian H. Williams, MD, FACS*, Evert Eriksson, MD, FACS, FCCP*, Michael W. Cripps, MD*, Tjasa Hranjec, MD, MS, Christian T. Minshall, MD, PhD*
University of Texas Southwestern Medical Center

Presenter: Madhu Subramanian, MD

Discussant: Scott Armen, MD, Penn State University

Objectives: Post-surgical fluid resuscitation requires critical analysis: over- and under-resuscitation are both known to be associated with worse outcomes. We hypothesized that a goal-directed fluid resuscitation protocol would standardize fluid administration and improve outcomes for elective surgery patients in the surgical intensive care unit (SICU).

Methods: We prospectively applied our resuscitation algorithm to all patients admitted to SICU after elective surgery over a four-month period. The algorithm incorporates vital signs, lab values, urine output, and arterial waveform analysis to determine when to initiate resuscitation and the type of fluid and volume administered. We compared the outcomes of patients resuscitated using the algorithm to those that deviated through univariate analysis.

Results: 45 patients met study criteria: 25 patients were resuscitated according to the protocol; 20 patients were not. There were no differences in baseline demographics; intra-operative: time, intravenous fluid administration, transfusion requirements, or urine output; between the two groups. The net fluid balance at 72 hrs was lower in the patients resuscitated with the algorithm (1586mL vs. 6290mL, $p<0.001$). This group also had decreased diuretic use (4 vs. 9, $p=0.049$) and a lower but not significant rate of AKI (5 vs. 7, $p=0.258$) and ICU LOS (3.0 vs. 3.5, $p=0.104$). No differences were seen in postoperative transfusion, reintubation, hospital LOS or overall mortality. Deviations from the algorithm included inappropriate initiation of resuscitation in 10 patients (50%), failure to use waveform analysis in 6 (30%), and the incorrect choice of fluid in 3 (15%).

Conclusions: SICU patients resuscitated using a goal-directed resuscitation algorithm have a more neutral fluid balance without an apparent resultant increase in complications. Compliance with the algorithm may reduce morbidity in critically ill patients.

Notes

Quick Shots Parallel Session I
Location: Cibolo Canyon Ballroom 1-6, Level 2

Quick Shot #4
January 13, 2016
1:18 pm

INSURANCE STATUS IS ASSOCIATED WITH COMPLEX PRESENTATION IN EMERGENCY GENERAL SURGERY PATIENTS

Jonathan Scott,, MD Joaquim M. Havens, MD*, Cheryl K Zogg, MSPH, MHS, John Rose, Jr., Ali Salim, MD*, Adil H. Haider, MD, MPH*
Center for Surgery and Public Health, Brigham and Women's Hospital

Presenter: Jonathan Scott, MD - @DrJohnScott

Discussant: Joseph Sakran, MD, MPH, Medical University of South Carolina

Objectives: The Affordable Care Act (ACA) has the potential to significantly impact access to care for previously uninsured patients in need of emergency general surgical (EGS) care. Our objective was to determine the relationship between insurance status and disease complexity at presentation among a national sample of EGS patients.

Methods: Data from the 2006-2009 National Emergency Department Sample were queried for patients 18-64y admitted through the emergency department with a primary diagnosis of appendicitis, diverticulitis, inguinal hernia, or bowel obstruction. Complex presentations were defined as those presenting with generalized peritonitis, intrabdominal abscess, perforated bowel, intestinal gangrene, or other disease-specific measures of complexity (***Table 1***). Multivariable logistic regression was used to determine the independent association between insurance and complex presentation. Models accounted patient- and hospital-level covariates (***Table 1***). Counterfactual models were used to examine hypothetical outcomes assuming that all uninsured patients were insured.

Results: 1,533,793 patients were included, with an overall uninsured rate of 11.6% (95%CI 11.1-12.1%). Uninsured patients had significantly higher unadjusted rates of complex presentation, and uninsured payer status was independently associated with complex presentation in all four EGS diagnoses (***Table 1***). Had uninsured patients been insured, counterfactual models suggest that there would have been a 4.8-15.7% relative reduction in the total number of complicated EGS presentations nationwide (***Table 2***).

Conclusions: Insurance status is independently associated with severity of disease presentation among EGS conditions on a national scale. In light of recently reaffirmed ACA insurance expansion provisions, these results anticipate increased access to emergent care for newly insured patients and a corresponding decline in complex EGS presentations.

Table 1. Association of Insurance Status and Complex Emergency General Surgery Presentation

EGS Disease State	Proportion presenting with complex disease, unadjusted; %, 95%CI[a]		Uninsured compared to insured patients; AOR,[c] 95%CI	p-value
	Insured[b]	Uninsured		
Acute Appendicitis[d,e]	**24.9%** [24.4, 25.5]	**26.3%** [25.5, 27.1]	**1.29** [1.24, 1.39]	0.001
Acute Diverticulitis[d,f]	**18.0%** [17.5, 18.5]	**19.4%** [18.4, 20.5]	**1.12** [1.04, 1.20]	0.002
Inguinal Hernia[d,g]	**78.1%** [76.8, 79.4]	**81.2%** [80.0, 83.3]	**1.25** [1.05, 1.48]	0.012
Bowel Obstruction[d,h]	**4.9%** [4.7, 5.0]	**6.0%** [5.3, 6.7]	**1.14** [1.01, 1.28]	0.035

Source: Nationwide Emergency Department Sample, years 2006-2009.
EGS, emergency general surgery; **CI**, confidence interval; **AOR**, adjusted odds ratio; a, **weighted** for population-level estimates; b, **insured includes** private, medcare, medicaid, and other insurance; c, **adjusted for** year, age, gender, charlson comorbidity index, patient income, patient rural status, hospital census region, hospital metropolitan status, and hospital fixed effects; d, **complicated presentation includes** generalized peritonitis, intrabdominal abscess, perforated bowel, and intestinal gangrene; e, complicated presentation includes appendicitis with perforation or abscess; f, complicated presentation includes obstruction due to mural thickening; g, complicated presentation includes hernia with strangulation or obstruction; h, complicated presentation includes feculent emesis.

Table 2. Change in Complex EGS Presentation if Uninsured Patients were Insured

EGS Disease State	Counterfactual,[a] weighted estimates[b] for uninsured patients; %, 95%CI	Absolute reduction in complex presentation if uninsured gain coverage; %, 95%CI	Relative reduction in complex presentation if uninsured gain coverage	p-value[c]
Acute Appendicitis[d,e]	**22.0%** [21.8, 22.2]	- **4.48%** [4.45, 4.50]	**-15.67%** [-15.60, -15.73]	< 0.001
Acute Diverticulitis[d,f]	**17.4%** [17.2, 17.5]	- **1.62%** [1.61, 1.63]	**-8.62%** [-8.60, -8.63]	< 0.001
Inguinal Hernia[d,g]	**77.2%** [76.8, 77.7]	- **3.57%** [3.53, 3.62]	**- 4.81%** [-4.77, -4.86]	< 0.001
Bowel Obstruction[d,h]	**4.9%** [4.9, 5.0]	- **0.63%** [0.63, 0.64]	**-11.37%** [-11.37, -11.37]	< 0.001

Source: Nationwide Emergency Department Sample, years 2006-2009.
EGS, emergency general surgery; **CI**, confidence interval; a, **counterfactual analysis** provides estimates under the assumption that all patient and facility variables are unchanged, but uninsured patients were re-coded as having insurance; b, **weighted** for population-level estimates; c, **adjusted for** year, age, gender, charlson comorbidity index, patient income, patient rural status, hospital census region, hospital metropolitan status, and hospital fixed effects; d, **complicated presentation includes** generalized peritonitis, intrabdominal abscess, perforated bowel, and intestinal gangrene; e, complicated presentation includes appendicitis with perforation or abscess; f, complicated presentation includes obstruction due to mural thickening; g, complicated presentation includes hernia with strangulation or obstruction; h, complicated presentation includes feculent emesis.

Notes

Quick Shots Parallel Session I
Location: Cibolo Canyon Ballroom 1-6, Level 2

Quick Shot #5
January 13, 2016
1:24 pm

SURGEON LED IN SITU TRAUMA TEAM SIMULATION - WHAT ARE THE BENEFITS, WHAT ARE THE COSTS?

William R. Leeper, MD, BSc, FRCSC, Elizabeth Hunt, Michael Kolaitis,
David T. Efron, MD*, Elliott R. Haut, MD, PhD, FACS*
London Health Sciences Centre

Presenter: William R. Leeper, MD, BSc, FRCSC

Discussant: Richard Falcone, Jr., MD, MPH, Cincinnati Children's Hosptial

Objectives: In situ simulation has been used as both a diagnostic tool for the identification of latent threats to patient safety (PS) and as an interprofessional (IP) educational tool. Trauma is an interprofessional discipline with the surgeon at the center of the process of care. We developed and instituted a surgeon led in situ trauma team simulation program at a level one inner city trauma center and utilized post simulation video analysis to identify obstacles to optimum performance and opportunities for improved team functioning.

Methods: We performed a pilot, mixed-methods (quantitative and qualitative) study of trauma teams managing an *in situ* simulated trauma activation. Main outcome measures included: (1) identification of latent PS concerns within the trauma bay, (2) identification of high leverage IP behaviors, and (3) human resource commitment required of lead trauma surgeon. Two reviewers analyzed video data from simulations in order to identify and quantify outcomes. Detailed post event summaries enhanced with video vignettes were created to facilitate ongoing reflection by the participants, deepen learning, and promote retention.

Results: During the 2014-2015 academic year, eleven in situ simulations have been conducted involving 101 participants including attending, fellow, and resident level physicians, registered nurses, nursing technicians, respiratory therapists, and critical care pharmacists. Simulations are conducted *in situ* within actual adult and pediatric trauma bays. Each simulation identified a mean of 2.1 latent PS concerns and highlighted 1.1 demonstrable examples of high quality IP behaviors. Each simulation consumed a mean of 15.2 hours of direct effort on the behalf of the lead surgeon (preparation = 6.1 hours, conduct = 3.1 hours, analysis = 5.8 hours). Focus groups conducted with key stakeholders (emergency department nursing staff, technical staff, trauma committee) have identified a strong positive impact of trauma surgeon involvement and a strong preference to expand and to continue the simulation curriculum.

Conclusions: Implementation of a surgeon led *in situ* trauma simulation was associated with identification of multiple PS and IP performance items and has reached a large number of trauma

providers with qualitatively positive impact. Measurable effort for this monthly program requires approximately 10% of a full-time equivalent attending level surgeon.

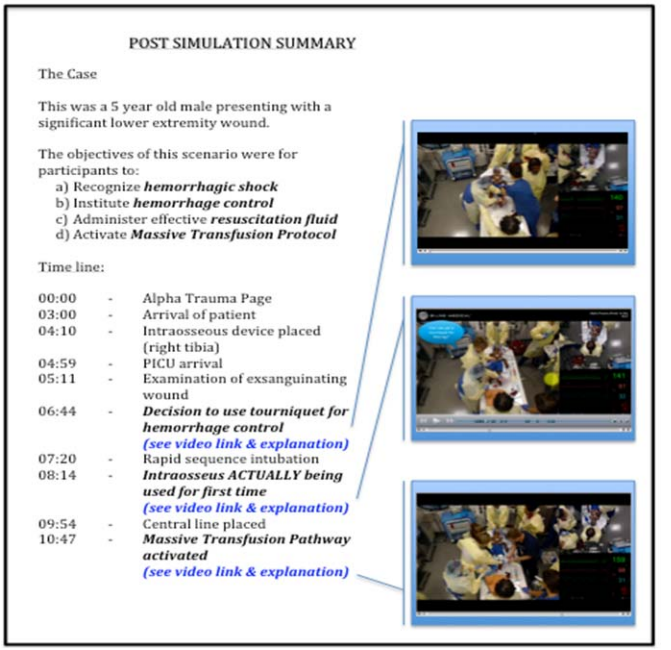


Figure 1. Example of detailed post simulation summary enhanced by narrated video vignettes. Post simulation summaries are provided to participants in order to facilitate reflection, deepen learning, and promote retention.

Notes

Quick Shots Parallel Session I
Location: Cibolo Canyon Ballroom 1-6, Level 2

Quick Shot #6
January 13, 2016
1:30 pm

STRUCTURED BRIEFING IMPROVES TRAUMA RESUSCITATION TEAMWORK

Susan Steinemann, Alexander Wei, Nina Ho, Gene Kurosawa,
Gregory Suares, Eunjung Lim, Benjamin Berg
University of Hawaii, John A. Burns School of Medicine

Presenter: Susan Steinemann

Discussant: Julie Nash, MSN, RN, Barnes-Jewish Hospital

Objectives: Briefing is a key aspect of teamwork. Yet, in many centers briefing of the accepting trauma team prior to patient arrival is unstructured, and is underemphasized in ATLS. We evaluated the impact of a structured, physician-led briefing on teamwork and concordance in simulated trauma resuscitations.

Methods: Trauma nurses (RNs) were surveyed about briefing at our Level II center; then completed 4, random ordered, SimMan-based resuscitation scenarios. Teams had 3-4 RNs (subjects) + 2-4 confederates (physicians, respiratory therapists). Scenarios were randomized as briefed(B) or non-briefed(NB), each team served as their own control group to examine the impact of briefing. In the 2 NB (control) scenarios, RNs independently reviewed a triage sheet with written information relayed to the emergency physician by pre-hospital medics. In the 2 B scenarios, a structured, 4-minute, physician-led briefing reviewed the same pre-hospital information. Confederates were blinded as to the whether or not the RNs had been briefed. Immediately before, and at the midpoint of each scenario, RNs ranked the top 3 (of 16) immediate care priorities. RNs responses were compared for concordance using intra-class correlation coefficient (ICC), and to Trauma/Crit Care MD answers using Fisher's exact test. Teamwork was rated by a teamwork expert using T-NOTECHS (Am J Surg), t-test compared B vs NB.

Results: 39 RNs participated. 95% "agreed/strongly agreed" briefing is important, but only 46% agreed briefing is done well at our center. Comparing B vs NB scenarios, RNs ranklists exhibited higher concordance with each other (ICC 0.64 vs 0.59) and significantly more agreement with MD answers ($p<0.001$) in B scenarios. T-NOTECHS Leadership ratings were significantly higher in the B scenarios (3.70 Â±0.83 vs 3.39 Â±1.01, $p<.01$).

Conclusions: Structured, physician-led briefing improves trauma team concordance and facilitates better leadership in simulated trauma resuscitations.

Notes

Quick Shots Parallel Session I
Location: Cibolo Canyon Ballroom 1-6, Level 2

Quick Shot #7
January 13, 2016
1:36 pm

EPIDEMIOLOGIC AND SPATIAL ANALYSIS OF TRAUMA TRANSFERS IN MONTREAL: A CALL FOR THE IMPLEMENTATION OF TRIAGE CRITERIA TO BYPASS SECONDARY TRAUMA CENTERS FOR DEFINITIVE TRAUMA CARE

Fadi T. Hamadani, BMedSc, MD, MSc, David Bracco, Tarek S. Razek, MD, FACS*,
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Andrew N. Beckett, MD*, Jeremy Grushka, MDCM, MSc, FRCSC, FRCPC
Montreal General Hospital, McGill University Health Centre

Presenter: Fadi T. Hamadani, BMedSc, MD, MSc

Discussant: Nathan Mowery, MD, Wake Forest School of Medicine

Objectives: 1) To assess how regionalization of trauma services on the Island of Montreal has impacted transfer patterns & access to care of severely injured patients. 2) Use advanced spatial analysis to describe the sequence of trauma patient transfers & identify areas with longest delays & transfer times. 3) Infer the effect of delayed transfer times on patient outcomes & health system costs.

Methods: We analyzed transport & emergency department (ED) door-to-door times (D2D) of injured patients from 2005-2014 as a function of demographics, injury mechanism & location, vital signs, & injury severity score (ISS). CDC-ASCOT triage criteria were used to identify the proportion of patients who should have bypassed the non-level-1 trauma center stratified by location. We used geographically-weighted multivariate regression to assess transport times and D2D as predictors of hospital & ICU length of stay (LOS) and the need for rehabilitation.

Results: 2420 patients were transported to a non-level-1 trauma center before requiring definitive transfer to the level-1 facility. ISS $\geq$ 15, penetrating injuries, high-velocity MVCs, & GCS $\leq$ 13 predicted shorter ED D2D & total transport times. Based on CDC-ASCOT, 53% of these patients should have bypassed the non-level-1 trauma center (Fig1). Regression showed that for each CDC-ASCOT criteria failed there was an increased ICU LOS of 2.2 days ($p<0.001$) at costs of \$4200-\$7200 per day. Spatial interpolation identified a 10km radius around the level-1 center with the longest delays.

Conclusions: Delayed transport of critically injured patients to definitive care led to longer hospital & ICU LOS & a higher need for rehabilitation. While the results argue for an inclusive trauma system that supports the capacity of non-level-1 centers, there is a need for the institution of bypass criteria in the field.

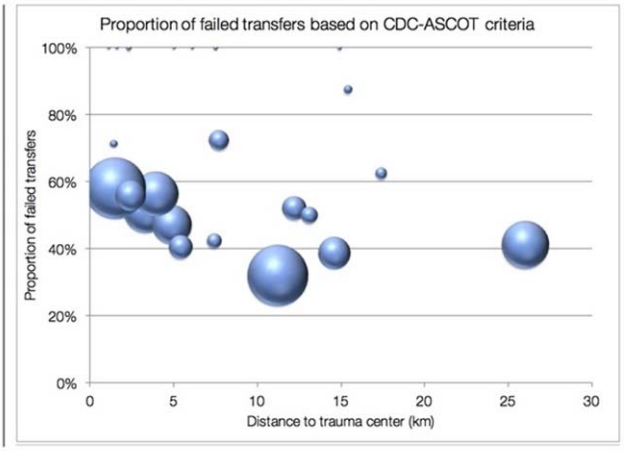


Figure-1. Spatial Analysis of trauma transfers on the island of Montreal. Based on CDC-ASCOT triage criteria, 53% of injured patients should have bypassed the non-level-1 trauma center. Spatial interpolation identifies a 10km radius around the level-1 center with the highest failures to by pass the non-level-1 trauma center.

Notes

Quick Shots Parallel Session I
Location: Cibolo Canyon Ballroom 1-6, Level 2

Quick Shot #8
January 13, 2016
1:42 pm

POLICE TRANSPORT VS. GROUND EMS: A TRAUMA SYSTEM LEVEL EVALUATION OF PRE-HOSPITAL CARE POLICIES AND THEIR EFFECT ON CLINICAL OUTCOMES

Michael Wandling, MD*, Michael B. Shapiro, MD*,
Avery B. Nathens, MD, PhD, MPH*, Elliott R. Haut, MD, PhD, FACS*
Northwestern University

Presenter: Michael Wandling, MD

Discussant: Paul Chestovich, MD, University of Nevada

Objectives: Rapid transport to definitive care ("scoop and run") versus field stabilization in trauma remains a topic of debate and has resulted in variability in pre-hospital policy. We aimed to identify trauma systems frequently using a true "scoop and run" police transport approach and to compare mortality rates between police and ground emergency medical services (EMS) transport.

Methods: Using the National Trauma Databank (NTDB), we identified adult (age≥16) gunshot and stab wound patients presenting to level 1 or 2 trauma centers from 2010-2012. Hospitals were grouped into their respective cities and regional trauma systems. We included patients directly transported by police or ground EMS to trauma centers in the 100 most populous US metropolitan areas. Frequency of police transport was evaluated, identifying trauma systems with high utilization. Unadjusted mortality rates and the risk-adjusted odds ratio for mortality for police vs. EMS transport were derived.

Results: Of 88,564 total patients, 86,097 (97.2%) were transported by EMS and 2,467 (2.8%) by police. 87.8% of police transports occurred in three locations (Philadelphia, Sacramento, and Detroit). Within these three trauma systems, unadjusted mortality was 19.9% for police transport and 13.5% for EMS. After adjusting for age, gender, race, injury severity, systolic blood pressure, heart rate, Glasgow Coma Scale, and insurance, patients transported by police were no more likely to die than those transported by EMS (OR=0.98, 95% CI: 0.65-1.48).

Conclusions: Using trauma system level analyses, we found that the majority of pre-hospital police transport in penetrating trauma occurs in three trauma systems. In these cities, police and EMS transport have similar survival outcomes. These three cities represent ideal sites for additional system-level evaluation of the role of "scoop and run" policies in urban trauma care.

	All Patients n or mean +/- SD	Ground EMS n or mean +/- SD	Police n or mean +/- SD	P Value
Population Size	88,564	86,097	2,467	-
Age	32.6 +/- 13.4	32.7 +/- 13.4	30.4 +/- 11.3	<0.001
Heart Rate[1]	90.5 +/- 31.3	90.6 +/- 31.1	88.1 +/- 37.2	<0.001
Systolic Blood Pressure[1]	123.3 +/- 41.5	123.6 +/- 41.2	113.1 +/- 48.8	<0.001
GCS Motor Score[1]	5.4 +/- 1.6	5.4 +/- 1.6	5.1 +/- 1.9	<0.001
Injury Severity Score	10.2 +/- 12.6	10.1 +/- 12.5	14.2 +/- 16.0	<0.001
Injury Mechanism				<0.001
Gunshot Wounds	47,224	45,582	1,642	
Stab Wounds	41,340	40,515	825	

[1]First documented value after arrival to the hospital.

Table 1: Baseline characteristics of sample population by mode of pre-hospital transportation.

	All Patients % (n)	Ground EMS % (n)	Police % (n)	P Value
All Penetrating Wounds	11.8% (10,422)	11.6% (9,986)	17.7% (436)	<0.001
Gunshot Wounds Only	19.5% (9,221)	19.3% (8,807)	25.2% (414)	<0.001
Stab Wounds Only	2.9% (1,201)	2.9% (1,179)	2.7% (22)	0.680

Table 2: Unadjusted mortality rates by mode of pre-hospital transportation.

Notes

Quick Shots Parallel Session I
Location: Cibolo Canyon Ballroom 1-6, Level 2

Quick Shot #9
January 13, 2016
1:48 pm

PERFORMANCE OF REGIONAL TRAUMA NETWORK: A STATE-WIDE ANALYSIS

Jack C. He, MD, Laura Kreiner, MD*, Nitin Sajankila,
Debra Allen, BSN, RN, Jeffrey A. Claridge, MD, MS*
MetroHealth Medical Center

Presenter: Jack C. He, MD

Discussant: Adam Fox, DO, Rutgers-NJMS

Objectives: Regional Trauma Network (RTN), composed of one level I and several lower level trauma centers (TCs) across multiple hospital systems, was established in 2010. Mortality between counties in RTN and other counties in the state were compared to assess RTN's performance.

Methods: Patients in the state trauma registry age ≥15 from 2006-2012 were analyzed. First, change in mortality over time was assessed by comparing all counties before and after RTN establishment. Then, two analyses were done for the post-RTN period: 1). a county-level analysis, comparing County C, the county containing RTN's level I TC (L1TC), to other counties containing L1TCs; 2). a regional analysis, comparing County C and its adjacent counties (i.e. RTN region) to other L1TC containing counties and their respective neighboring counties. The following patient subgroups were included *a priori* for both comparisons: Injury Severity Score (ISS) ≥15, age ≥65, and mechanisms.

Results: 178,143 patients were analyzed. Mean age was 57; 91% had blunt injuries. Overall patient mortality was 4.7%. County C was the only county that had a decrease in mortality for both the overall group (relative reduction of 24%) and all patient subgroups over time (all $p < 0.05$). Both the county-level and regional analyses showed that RTN patients were 1-4 years older ($p < 0.05$), had similar or higher ISS ($p < 0.05$), and were treated more often at lower level TCs ($p < 0.001$). Mortality for the county-level and regional analyses are shown in Tables 1 and 2, respectively.

Conclusions: County C was the only county in the state that had significant mortality reduction for all patient groups over time. Trauma system regionalization was associated with greater utilization of lower level TCs and lower patient mortality. An amplified survival benefit was seen when County C or RTN region was compared to counties or regions with multiple L1TCs, suggesting that having one L1TC in a county or region may be superior.

COUNTY C VS. COUNTIES WITH ANY NUMBER OF L1TC LOCATED WITHIN					
Patient Group	County C		Non-RTN Counties		p-value*
	Total (n)	Morality (%)	Total (n)	Morality (%)	
All Patients	9235	5.0%	27398	5.0%	0.958
ISS ≥ 15	1258	20.6%	4237	21.6%	0.457
Age ≥ 65	4546	4.1%	11867	4.9%	**0.039**
Blunt Injury	8098	3.6%	24379	3.9%	0.239
Penetrating Injury	983	14.9%	2482	14.3%	0.668
COUNTY C VS. COUNTIES WITH ONLY 1 L1TC LOCATED WITHIN					
All Patients	9235	5.0%	10274	4.8%	0.466
ISS ≥ 15	1258	20.6%	1635	21.2%	0.712
Age ≥ 65	4546	4.1%	4769	4.1%	0.958
Blunt Injury	8098	3.6%	9127	3.6%	0.838
Penetrating Injury	983	14.9%	1043	13.5%	0.408
COUNTY C VS. COUNTIES WITH > 1 L1TC LOCATED WITHIN					
All Patients	9235	5.0%	17124	5.2%	0.702
ISS ≥ 15	1258	20.6%	2602	21.9%	0.380
Age ≥ 65	4546	4.1%	7098	5.3%	**0.002**
Blunt Injury	8098	3.6%	15252	4.1%	0.063
Penetrating Injury	983	14.9%	1439	14.8%	1.000

* p-value ≤ 0.05 is considered significant

Table 1: County-Level Mortality Comparison

RTN REGION VS. REGIONS WITH ANY NUMBER OF L1TC COVERAGE					
Patient Group	RTN Region		Non-RTN Regions		p-value*
	Total (n)	Mortality (%)	Total (n)	Mortality (%)	
All Patients	14178	4.3%	40293	5.0%	**< 0.001**
ISS ≥ 15	1721	20.1%	6466	21.2%	0.3
Age ≥ 65	6921	3.8%	17759	5.2%	**< 0.001**
Blunt Injury	12733	3.3%	36481	4.1%	**< 0.001**
Penetrating Injury	1215	13.1%	3012	14.3%	0.33
RTN REGION VS. REGIONS WITH ONLY 1 L1TC COVERAGE					
All Patients	14178	4.3%	14847	4.5%	0.39
ISS ≥ 15	1721	20.1%	2393	20.4%	0.81
Age ≥ 65	6921	3.8%	6959	4.2%	0.24
Blunt Injury	12733	3.3%	13476	3.6%	0.28
Penetrating Injury	1215	13.1%	1240	13.2%	1
RTN REGION VS. REGIONS WITH >1 L1TC COVERAGE					
All Patients	14178	4.3%	25446	5.3%	**<0.001**
ISS ≥ 15	1721	20.1%	4073	21.7%	0.16
Age ≥ 65	6921	3.8%	10800	5.9%	**< 0.001**
Blunt Injury	12733	3.3%	23005	4.5%	**< 0.001**
Penetrating Injury	1215	13.1%	1772	15.1%	0.14

* p-value ≤ 0.05 is considered significant

Table 2: Regional Mortality Comparison

Notes

Quick Shots Parallel Session I
Location: Cibolo Canyon Ballroom 1-6, Level 2

Quick Shot #10
January 13, 2016
1:54 pm

WHO SHOULD MANAGE THE ADOLESCENT SEVERE HEAD-INJURED PATIENT? A STATEWIDE ANALYSIS OF PEDIATRIC VERSUS ADULT TRAUMA CENTERS

Daniel Wu, DO, FACOS, FACS*, Brian Gross, Ashley Zalewski,
Maria Gillio, Autumn Vogel, Jo Ann Miller, RN, BSN, CCRN,
Frederick Rogers, MD, MS, FACS*
Lancaster General Health

Presenter: Daniel Wu, DO, FACOS, FACS

Discussant: Nicole Fox, MD, Cooper University Hospital

Objectives: Non-pediatric trauma centers must often decide whether adolescent trauma patients (aged 15-17) presenting with severe head injuries (SHI) can be effectively managed at their facility or should be transferred to a pediatric center. We sought to determine whether mortality differences existed between pediatric and non-pediatric trauma centers while adjusting for injury severity and demographic covariates. It was hypothesized pediatric trauma centers would provide a survival advantage in SHI patients.

Methods: All trauma admissions aged 15-17 presenting with severe traumatic brain injury (TBI) (head Abbreviated Injury Scale [AIS] 4-5) to the 29 level I-II accredited trauma centers in Pennsylvania from 2003-2013 were extracted from the Pennsylvania Trauma Systems Foundation state registry. Patients transferred from adult to pediatric trauma centers were excluded from analysis. Trauma centers with no pediatric affiliation were considered non-PED (n=20), while standalone pediatric hospitals and centers with pediatric affiliation were considered PED (n=9). A multivariate logistic regression model controlling for injury severity and demographic covariates assessed the effect of pediatric affiliation on mortality.

Results: A total of 724 SHI patients aged 15-17 presented over the 11-year study period (non-PED: 347; PED: 377). In a multivariate logistic regression model controlling for admission systolic blood pressure, Glasgow-coma score (GCS), and head AIS, PED centers were found to have a 37% reduction in mortality compared to non-PED counterparts (AOR: 0.631, 0.426-0.934; p=0.022) (Figure 1).

Conclusions: There is a trend that favors the care of SHI adolescent patients at pediatric trauma centers rather than adult trauma centers.

Variable	Adjusted Odds Ratio (95% CI)	p-value
Pediatric	0.631 (0.426-0.934)	0.022
Systolic BP	0.985 (0.979-0.991)	<0.001
GCS	0.674 (0.570-0.796)	<0.001
Head AIS	3.081 (1.953-4.860)	<0.001
Constant	0.052 (0.005-0.506)	0.011
N = 724		
AUROC: 0.76		

Adjust odds of mortality controlling for admitting systolic blood pressure, GCS, and head AIS

Notes

Quick Shots Parallel Session II
Location: Nelson Wolff Exhibit Hall A, Level 1

Quick Shot #11
January 13, 2016
1:00 pm

PLATELET DYSFUNCTION CORRELATES WITH PROGRESSION OF INTRACRANIAL HEMORRHAGE IN TRAUMATIC BRAIN INJURY

Bradley Putty, MD, Scott Kayser, Rajesh R. Gandhi, MD, PhD, FACS, FCCM*, Mackenzie Campbell-Furdick, Obi Okoye, Daniel Naughton, MD, Jamie Rand, MD, Celeste Caliman, Carl Freeman, MD, FACS*, Therese M. Duane, MD, FACS*
JPS Health Network

Presenter: Bradley Putty, MD

Discussant: Alison Wilson, MD, West Virginia University

Objectives: Patients presenting with traumatic brain injury (TBI) frequently develop a TBI-associated coagulopathy that traditionally has been described using international normalized ratio elevation and thrombocytopenia, and more recently studied using thromboelastography (TEG). The mechanism of this coagulopathy is not well defined, nor has it been correlated with progression of intracranial hemorrhage (ICH). The purpose of this study is to identify TEG parameters that are associated with ICH and its progression in TBI.

Methods: In 2012, the resuscitation protocols at two urban level 1 trauma center hospitals were amended to include admission TEG with platelet mapping (PM) for TBI patients, and follow up CT imaging for those with ICH. Adult subjects presenting with a TBI (head abbreviated injury score (AIS) 1-5 with or without ICH) from December 2012 to December 2014 were identified, and demographic and clinical variables to include age, gender, Glasgow Coma Scale (GCS), Injury Severity Score (ISS), AIS by body area, and type of ICH were collected. TEG and PM values were evaluated based on presence of ICH, severity (AIS>3) and progression of ICH.

Results: The predominant mechanism was blunt (Table 1). The median age, head AIS, and ISS were 48.4(18-94), 4, and 21. There were no significant differences in TEG or PM values except for arachidonic acid receptor site inhibition (%AA). Median values were significantly higher in subjects with ICH compared to those without ICH (33.2 vs 16.8, p=.006). For those with a primary diagnosis of TBI (n=559, defined as all other AIS < 3), severity of TBI (head AIS>3 vs <3) demonstrated similar correlation with %AA (35 vs 25, p=.04). AA inhibition >30% was associated with progression in volume of ICH on subsequent CT imaging (Table 2).

Conclusions: AA inhibition is significantly elevated in those presenting with ICH, and correlates with severity of injury. Furthermore, AA inhibition >30% is predictive of progression of ICH on repeat imaging. This may serve as a target for intervention to reduce progression of ICH and improve outcome.

Table 1: Study Population

Total	n=643
Age 18-94y	47.0 (30, 62)
Male (%)	479 (74.8)
Mechanism; Blunt (%)	604 (94.5)
Head AIS	4 (3, 4)
ISS	21 (16, 29)
Mortality	123 (19.2%)

Data reported as median with interquartile range
AIS, Abbreviated Injury Scale; ISS, Injury Severity Score

Table 2: Correlation of Arachidonic Acid Greater than 30% with Progression of Bleed

	Odds Ratio	*p*
All Progression	2.00 (1.22-3.31)	0.01
Minimal Progression	1.65 (0.91-2.97)	0.1
Significant Progression*	2.32 (1.17-4.60)	0.02

*Defined as large volume progression and/or craniotomy

Notes

Quick Shots Parallel Session II
Location: Nelson Wolff Exhibit Hall A, Level 1

Quick Shot #12
January 13, 2016
1:06 pm

SAFETY OF THERAPEUTIC ANTICOAGULATION IN PATIENTS WITH TRAUMATIC BRAIN INJURY

Kazuhide Matsushima*, Kenji Inaba, MD, Jayun Cho, Crystal Cornell, Hussan Mohammed, Keith Herr, Aaron Strumwasser, Gregory Magee, Daniel J. Grabo, MD, FACS*, Lydia Lam, Elizabeth Benjamin, Demetrios Demetriades, MD
LAC+USC Medical Center

Presenter: Kazuhide Matsushima

Discussant: Herb A. Phelan, III, MD, UT Southwestern Medical Center

Objectives: Anticoagulant therapy (ACT) is often required in trauma patients for various indications; however, it remains unknown whether ACT can be safely initiated in the post-injury period for the patients with traumatic brain injury (TBI). The purpose of this study was to evaluate the safety of ACT in acute TBI patients.

Methods: We conducted a 7-year (2008-2014) retrospective study at a high-volume Level 1 trauma center. All TBI patients who received ACT within 60 days post-injury were included. In addition to patient and injury characteristics, detail information regarding ACT (e.g. indication, type and timing of initiation) was collected. Primary outcome was progression of hemorrhagic TBIs on repeat head computed tomography (HCT) or neurological deterioration after the initiation of ACT. All HCTs were retrospectively reviewed by radiologists for initial Rotterdam score and volumetric analysis of hemorrhagic TBI. Univariable and multivariable analyses were used to identify the factors significantly associated with the progression of TBI after ACT.

Results: A total of 3,355 TBI patients were identified. Of those, 72 patients (2.1%) received ACT. Median age: 58.5, 76.4% male, median ISS: 19, median Rotterdam score on the initial HCT: 3. While atrial fibrillation was the most common pre-injury indication for ACT, venous thromboembolism was the most common post-injury indication for ACT. ACT was initiated on the median 9 days post- injury (IQR: 4-18). Intravenous heparin infusion was the most commonly used for ACT (63.9%), followed by low-molecular weight heparin. None of our study patients had any signs of neurological deterioration due to ACT. Progression of hemorrhagic TBI on the repeat CT was observed in 6/25 patients. Five of these 6 patients were age ≥65 years (83.3% vs. 21.1% in NO worsening group, p=0.012). In a logistic regression model, age ≥65 years was significantly associated with the progression of TBI after ACT (OR: 15.2, 95% CI: 1.1-212.7, p=0.043).

Conclusions: This study showed preliminary results regarding the safety of ACT in patients with TBI. It appeared to be safe to initiate ACT in carefully selected cases. Further prospective study will be warranted to determine the risk and benefit of ACT in this specific group of patients.

Notes

Quick Shots Parallel Session II
Location: Nelson Wolff Exhibit Hall A, Level 1

Quick Shot #13
January 13, 2016
1:12 pm

COST-EFFECTIVENESS OF CERVICAL SPINE COLLAR CLEARANCE INTERVENTIONS IN OBTUNDED ADULT TRAUMA PATIENTS

Audrey E. Ertel, MD, MS, Bryce R.H. Robinson, MD, MS, FACS, FCCM*, Mark Eckman
University of Cincinnati

Presenter: Audrey E. Ertel, MD, MS

Discussant: Therese Duane, MD, JPS Health Network

Objectives: Recent guidelines from EAST conditionally recommend cervical collar removal after a negative cervical CT in obtunded adult blunt trauma patients. Though the rates of missed injury are extremely low, the impact of chronic care costs and litigation upon decision-making remains unclear. We hypothesize that the cost-effectiveness of strategies that include additional imaging may contradict current guidelines.

Methods: A cost-effectiveness analysis was performed for a base-case 40 year-old, obtunded, male with a negative CT. Strategies compared included: adjunct imaging with cervical MRI, collar maintenance for 6 weeks, or removal. The probability for collar pressure ulcer formation, spine injury, imaging costs, acute and chronic care, and litigation were obtained from published and Medicare data. Outcomes were expressed as 2014 US dollars and quality-adjusted life-years (QALYs).

Results: MRI was more effective and less costly than collar use or removal (20.00 vs. 19.99 vs. 19.98 QALYs; $361,168 vs. $361,345 vs. $361,828) in the base case analysis. When the probability of missed injury on CT is reduced to <0.00001, collar removal becomes more cost-effective. MRI remains more effective than other strategies above that threshold, however cost is prohibitively high until the probability exceeds 0.00041, at which point cost per QALY for MRI drops below $100K. Above a probability of 0.00053 for missed injury on CT, cost per QALY gained drops below $50K. Adjunctive imaging with MRI dominates all strategies until cost of MRI exceeds $450. When the cost of MRI exceeds $1,050, the cost per QALY for adjunctive MRI exceeds $50K (figure).

Conclusions: Adjunctive MRI for obtunded adult blunt trauma patients appears to be the most effective and least costly strategy for cervical clearance. Future cervical care strategies must be analyzed in the context of cost-effectiveness and may contradict current guidelines.

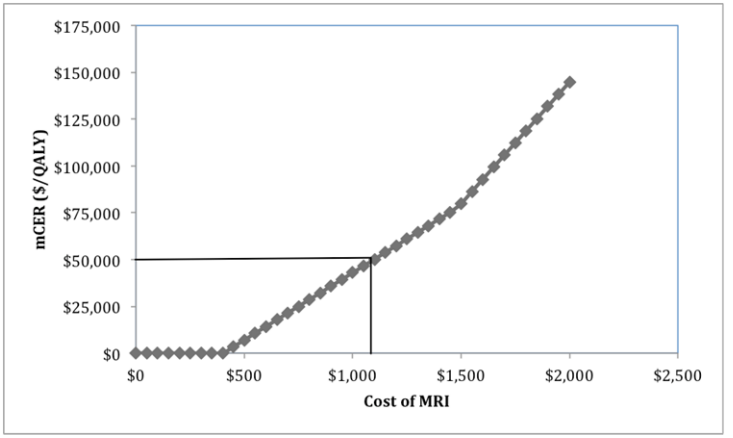


Figure: The marginal cost-effectiveness ratio (mCER; dollars per quality-adjusted life year) of adjunct MRI vs. application of collar based on cost of imaging.

Notes

Quick Shots Parallel Session II
Location: Nelson Wolff Exhibit Hall A, Level 1

Quick Shot #14
January 13, 2016
1:18 pm

EMBEDDING A HOSPITALIST ON THE TRAUMA SERVICE REDUCES MORTALITY AND READMISSIONS

Mark D. Cipolle, MD, PhD*, Joan M. Pirrung, RN, MSN, ACNS-BS*, Erin Meyer, Bailey Ingraham Lopresto, Seema Sonnad, Glen H. Tinkoff, MD*
Christiana Care Health System

Presenter: Mark D. Cipolle, MD, PhD

Discussant: Natasha Becker, MD, Baylor College of Medicine

Objectives: Recognizing the increasing age and comorbid conditions of patients admitted to our trauma service, we embedded a hospitalist on the trauma service at our level 1 trauma center. This program was initiated in January of 2013. This study was designed to investigate any differences in outcomes before and after the implementation of the trauma hospitalist (T-Hosp) program.

Methods: There were 566 patients co-managed with the T-Hosp between Dec 2013-Nov 2014. These patients were matched (1:2) with propensity scores to a pre T-Hosp control group based on age, ISS, and comorbid conditions. Outcomes examined included: mortality, trauma-related readmissions, upgrades to the ICU, hospital length of stay (LOS), the development of in-hospital complications, and the frequency of obtaining medical subspecialist consultation. Differences in outcomes were compared with Mann-Whitney or Chi-Square tests as appropriate.

Results: High quality matching resulted in the loss of 97 T-Hosp patients for the final analysis. Table 1 shows the balance between the two groups after matching. While there was a one day increase in hospital LOS, and an increase in upgrades to the ICU, there was a reduction in mortality, trauma-related readmissions, and the development of renal failure after implementation of the T-Hosp program (Table 2). Implementation of this program made no significant difference in the frequency of cardiology, nephrology, neurology, or endocrinology consultations. There was also no difference in the development of the complications of venous thromboembolism, pneumonia, stroke, urinary tract infection, bacteremia, or alcohol withdrawal.

Conclusions: Our study provides evidence that embedding a hospitalist on the trauma service reduces mortality and trauma-related readmissions. A reason for these improved outcomes may be related to T-Hosp "vigilance" as reflected by the increase in upgrades to the ICU.

Table 1. Results of propensity score matching

	Pre-T-Hosp (n=938)	Post T-Hosp (n=469)	P-value
Years of Age, mean(SD)	71.9 (16.1)	71.6 (15.9)	0.77
ISS, mean(SD)	9.5 (8.3)	9.9 (6.3)	0.27
Diabetes, n (%)	234 (25.0%)	121 (28.5%)	0.73
Hypertension, n (%)	697 (74.3%)	337 (71.9%)	0.33
CHF, n (%)	97 (10.3%)	54 (11.5%)	0.50
CVA, n (%)	70 (7.5%)	39 (8.3%)	0.57
≥ 1 comorbidity, n (%)	759 (80.9%)	385 (82.1%)	0.59

Table 2. Outcomes before and after implementation of T-Hosp program

	Pre-T-Hosp (n=938)	Post T-Hosp (n=469)	P-value*
Mortality, n (%)	27 (2.9%)	2 (0.4%)	0.002
Trauma-related readmission, n (%)	22 (2.3%)	3 (0.6%)	0.02
Hospital LOS (days), mean(SD)	5.7 (13.3)	6.9 (8.3)	0.048
Upgrade to ICU, n (%)	20 (2.1%)	20 (4.3%)	0.02
Renal failure, n (%)	11 (1.2%)	0 (0%)	0.02

**Fisher Exact Tests were used where the expected count of a subgroup's outcome was below a count of 5 patients

Notes

Quick Shots Parallel Session II
Location: Nelson Wolff Exhibit Hall A, Level 1

Quick Shot #15
January 13, 2016
1:24 pm

OPEN CHEST CARDIAC MASSAGE OFFERS NO BENEFIT OVER CLOSED CHEST COMPRESSIONS IN PATIENTS WITH TRAUMATIC CARDIAC ARREST

Matthew J. Bradley, MD*, Brandon Bonds, MD, Luke Chang, Shiming Yang, PhD,
Peter Hu, PhD, Hsiao-chi Li, Megan Brenner, MD*,
Thomas M. Scalea, MD, FACS, FCCM*, Deborah M. Stein, MD, MPH, FACS, FCCM*
R Adams Cowley Shock Trauma Center, University of Maryland School of Medicine

Presenter: Matthew J. Bradley, MD

Discussant: Joseph J. DuBose, MD, University of California-Davis

Objectives: Open chest cardiac massage (OCCM) is a commonly performed procedure after traumatic cardiac arrest (TCA). OCCM has been reported to be superior to closed chest compressions (CCC) in animal models and in non-traumatic cardiac arrest. The purpose of this study is to prospectively compare OCCM versus CCC in traumatic cardiac arrest using end-tidal carbon dioxide (ETCO2), the gold standard for determining the effectiveness of chest compressions and detection of return of spontaneous circulation (ROSC), as the surrogate for cardiac output and marker for adequacy of resuscitation.

Methods: This prospective observational study enrolled patients over a nine-month period directly presenting to a Level 1 trauma center after TCA. Continuous high-resolution ETCO2 measurements were collected every six seconds for periods of CCC and OCCM, respectively. Patients receiving CCC-only were compared to patients receiving CCC followed by OCCM. Student t-tests were used to compare ETCO2 within and between groups.

Results: Thirty-five patients were enrolled (17 OCCM, 18 CCC-only). Mean time of CCC prior to OCCM was sixty-six seconds. Within the OCCM group, both peak and mean ETCO2 levels significantly increased when comparing the initial CCC period to the OCCM interval. Using a time-matched comparison, similar significant increases were observed when comparing the first minute of CCC to the remaining time in the CCC-only group. However, when periods of OCCM were compared to equivalent periods of CCC-only, there were no differences in the initial, final, peak, or mean ETCO2 values (Table 1). Correspondingly, no difference in rates of ROSC was observed between groups (OCCM 23.5% vs CCC 38.9%, p=0.53).

Conclusions: We found no significant improvement in ETCO2 or ROSC with OCCM. With newer endovascular techniques for aortic occlusion, thoracotomy solely for performing OCCM provides no benefit over CCC.

Table 1. ETCO2 Values for CCC-only and OCCM groups

	CCC Only* (n=18)			OCCM (n=17)			CCC vs. OCCM
	First Minute	Remaining Time	p-value	CCC†	OCCM	p-value	p-value
Initial ± SD	6.1 ± 9.4	8.2 ± 10.6	0.53	3.4 ± 3.4	8.5 ± 5.7	0.007	0.92
Final ± SD	6.4 ± 6.9	16.2 ± 12.1	0.01	7.2 ± 6.9	14.8 ± 12.1	0.03	0.73
Peak ± SD	9.0 ± 9.7	27.4 ± 16.5	0.003	10.4 ± 10.4	28.8 ± 22.2	0.004	0.83
Mean ± SD	6.8 ± 7.4	12.4 ± 6.1	0.02	6.8 ± 6.4	13.1 ± 8.7	0.02	0.78

*CCC-only data separated into first minute and the remainder of CCC period for comparison to OCCM

†Mean CCC period duration prior to OCCM = 66.3 ± 33.1 seconds

ETCO2=end-tidal carbon dioxide; CCC=closed chest compressions; OCCM=open chest cardiac massage; SD=standard deviation

Notes

Quick Shots Parallel Session II
Location: Nelson Wolff Exhibit Hall A, Level 1

Quick Shot #16
January 13, 2016
1:30 pm

THE TEMPORAL RESPONSE WITH TRANEXAMIC ACID ON GUT BARRIER PROPERTIES IN AN IN VITRO MODEL OF TRAUMA-HEMORRHAGIC SHOCK

Mark E. Diebel, MD, David Liberati, MS, Lawrence N. Diebel, MD*
Wayne State University

Presenter: Mark E. Diebel, MD

Discussant: David J. Ciesla, MD, MA, UMA-Tampa General Hospital

Objectives: Intestinal hypoperfusion associated with trauma-hemorrhagic shock (T/HS) leads to impaired gut barrier function due to uptake of luminal factors including pancreatic digestive enzymes. Studies have shown that tranexamic acid (TXA) administered luminally or systemically protects gut barrier function when administered prior to or "early" after the insult. However the therapeutic window for TXA administration is unknown and served as the basis for the current study.

Methods: Caco-2 (intestinal cells)+HT29-MTX (mucus cells) intestinal epithelial cell (IEC) co cultures were established in a two-chamber cell culture system. IEC co cultures were then exposed to hypoxia-reoxygenation (HR) challenge ± trypsin added to the apical media. TXA was added after 90 minute hypoxia challenge at time 0, 60 and 120 minutes after reoxygenation. IEC barrier function was indexed by permeability (FITC-dextran), apoptosis, transepithelial electrical resistance (TEER) and mucus thickness and viscosity. Mucin 2 and 13 content of the mucus layer was determined by western blot and quantified by relative density calculation.

Results: Please see Table.

Conclusions: TXA administration protected IEC barrier function when administered "early" after the hypoxic event. No effect was noted when TXA was given >60 minutes after the hypoxic event. Our study correlates the clinical data that to be effective, TXA should be administered early in patients with T/HS. Protection of gut barrier function with "early" TXA administration following T/HS may be important for the anti-inflammatory effects noted with TXA in clinical studies.

Mean ± SD, N = 4 for each group

	Perm. (nmol/cm²/hr)	% Apop	TEER	Mucus thickness (µm)	Viscosity (dyne/cm²)
IEC baseline	0.30 ± 0.02	4.9 ± 0.7	197± 5	150 ± 10	26,200 ± 200
IEC + H/R + trypsin	1.63 ± 0.06*	39.8 ± 2.3*	166± 5*	50 ± 5*	4,100 ±125*
IEC + H/R+ trypsin + TA (Time 0)	0.46 ± 0.03*#	6.2 ± 1.5*#	185± 10#	125 ± 10*#	23,900 ± 150*#
IEC + H/R + trypsin + TA (Time 60min)	1.24 ± 0.04*#	25.8 ± 2.5*#	172± 7*	75 ± 5*#	7,400 ±100*#
IEC + H/R + trypsin + TA (Time 120min)	1.58 ± 0.06*	28.1 ± 3.0*#	170± 6*	50 ± 5*	5,800 ±125*#

*p<0.001 vs. IEC baseline , #p<0.001 vs. IEC + HR + trypsin

Mucin 2 and 13 content remained near control values only with TXA administration immediately after hypoxic event.

Notes

Quick Shots Parallel Session II
Location: Nelson Wolff Exhibit Hall A, Level 1

Quick Shot #17
January 13, 2016
1:36 pm

QUANTIFICATION OF THE HEMODILUTIONAL EFFECT OF CRYSTALLOID RESUSCITATION IN A CLASS III HEMORRHAGE MODEL

Ciara R. Huntington, M.D., A. Britton Christmas, MD, FACS*, Samuel Wade Ross, MD, MPH, Rebecca Powell, Peter E. Fischer, MD, MS*, B. Todd Heniford, Ronald F. Sing, DO*
Carolinas Medical Center

Presenter: Ciara R. Huntington, MD

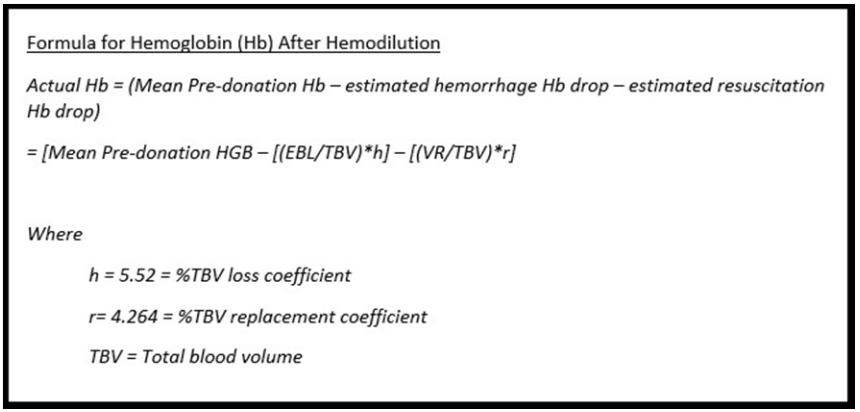
Discussant: Christopher Dente, MD, Emory University

Objectives: A previous randomized controlled trial quantified the hemodilutional effect of crystalloid resuscitation in a Class I hemorrhage model of human blood donors. This study tests the resulting equation's ability to predict hemoglobin(Hb) levels after hemodilution in a Class III hemorrhage model in rats.

Methods: Sprague-Dawley rats underwent controlled Class III hemorrhage(35% blood volume by weight) via carotid arterial cannula. A "sham" control group underwent anesthesia without hemorrhage or resuscitation. One hour following hemorrhage, 1:1 resuscitation with normal saline, lactated Ringers, or Normosol^{TM} solution was performed; a hemorrhage-only control group did not receive crystalloid resuscitation. Measured and formula-calculated Hb were compared immediately and 3hours post-resuscitation, and correlation coefficients(CC) were determined.

Results: 25 rats were included in analysis. Mean Hb decreased 3.4 grams/deciliter after hemorrhage. Median Hb were similar in hemorrhage-only control group(HO) vs. resuscitation group(RG) prior to hemorrhage(13.3vs.12.8,$p>0.05$) and at the end of hemorrhage (9.5HOvs.9.2RG,$p>0.05$), but immediately after resuscitation, median Hb were significantly lower in the RG(9.2HOvs.7.5RG,$p=0.018$). This difference persisted at 3 hours post-resuscitation (7.5HOvs.6.7RG,$p=0.03$). CC of actual and formula-predicted Hb was significant immediately following resuscitation (0.94,$p<0.0001$) and at 3 hours post resuscitation (0.73,$p=0.0001$).

Conclusions: Hemodilution exists after crystalloid resuscitation for hemorrhage, and the previously defined mathematic relationship remains accurate in a Class III hemorrhage model in rats. This finding has significance for interpretation of initial lab values in severe hemorrhage and merits validation in large mammalian models.



Hemodilution Formula: A previously derived formula to predict hemoglobin levels from a given blood loss and crystalloid volume replacement.

Notes

Quick Shots Parallel Session II
Location: Nelson Wolff Exhibit Hall A, Level 1

Quick Shot #18
January 13, 2016
1:42 pm

THROMBIN GENERATION PROFILE AS PREDICTOR OF VENOUS THROMBOEMBOLISM (VTE) AFTER TRAUMA: A PROSPECTIVE CASE-COHORT STUDY

Myung Park, MD*, Ailing Xue, Grant Spears, Timothy Halling, ASc, Michael Ferrara, Melissa Kuntz, Satbir K Dhillon, MD, Donald H. Jenkins, MD*, William Harmsen, MS, Kent Bailey, John Heit
Mayo Clinic

Presenter: Myung Park, MD

Discussant: Erik Streib, MD, Eskenazi Health, IUHP

Objectives: The Surgeon General recommends assessment of the risk of VTE for every hospitalized patient. We hypothesize that injured patients(pts) with accelerated thrombin generation early after injury are at increased risk of development of VTE within 3 months after trauma.

Methods: Trauma pts were enrolled from Feb 2011 to June 2014. Blood was collected by venipuncture into 3.2% trisodium citrate at 0, 6, 12, 24 and 72 hours after injury, and discharge. Platelet poor plasma was harvested and stored at -80°C until analysis. Thrombin generation was determined using the calibrated automated thrombogram (CAT) using 5 pM tissue factor (TF)/4 uM phospholipid (PS; strong coagulation activator), reported peak height (nM thrombin) and time to peak height (ttPeak [minutes]). Data are presented as median [IQR] or hazard ratio(HR) with (95% CI).

Results: Among 443 trauma pts (ISS=13.0 [6.0, 22.0], hospital LOS=4.0 [2.0, 10.0] days, age=48 [28, 65] years, 70.7% male, 95% with blunt mechanism, mortality 3.2%). Fifty four pts developed symptomatic VTE within 92 days after injury, 27 (55%) after hospital discharge. Some of the predictors of VTE are outlined in the TABLE. In a multivariate Cox model that included clinical characteristics available at 24 hours of admission, increased pt age (1.21 [1.02,1.43], P=0.025), body mass index (BMI $\geq$ 25) (3.14[1.23,8.02], P=0.017), lack of mechanical prophylaxis(2.30[1.25, 4.23], P=0.007) and most hypercoagulable (shortest) ttPeak value reached during initial 24 hours (1.24[1.10, 1.44], p=0.007) were independent predictors of incident VTE within 92 days after trauma with C-statistic=0.74.

Conclusions: Plasma coagulome (as reflected by thrombin generation via CAT) is important for stratifying VTE risk. Combination of clinical characteristics and ttPeak can be used to stratify acute trauma pts into high and low risk for VTE. This multivariable model needs to be validated.

Table: Univariable Cox Proportional Hazard of Variables Available at 24-Hours of Injury: Independent Predictors of VTE after Trauma

Variables	HR (95% CI)	P-value
Age (per 10 year increase)	1.18 [1.02, 1.37]	0.029
BMI ≥ 25	3.95 [1.56, 10.03]	0.004
ISS (per 5 point increase)	1.19[1.05, 1.35]	0.008
Any Transfusion	2.17[1.19, 3.95]	0.012
No Mechanical Prophylaxis	2.08[1.15, 3.74]	0.015
Total Bedrest	2.10[1.06, 4.17]	0.034
No Chemoprophylaxis	0.76[0.41, 1.38]	0.360
Time to Peak (per .5 minute decrease)	1.25[1.06, 1.48]	0.008
Peak Height (per 25 μM increase)	1.27[1.11, 1.44]	<0.001

Notes

Quick Shots Parallel Session II
Location: Nelson Wolff Exhibit Hall A, Level 1

Quick Shot #19
January 13, 2016
1:48 pm

HYPERTONIC SALINE AFTER DAMAGE CONTROL LAPAROTOMY AND PRIMARY FASCIAL CLOSURE: PILOT STUDY

Michelle Buehner, MD, Valerie Sams, MD*, Brian Hernandez,
Joel Michalek, Xiaoming Shi, Christopher E. White, MD, FACS*
San Antonio Military Medical Center

Presenter: Michelle Buehner, MD

Discussant: Jason Smith, MD, PhD, University of Louisville

Objectives: The inability to close the abdominal wall following an initial damage control laparotomy (DCL) has led to new challenges. Hypertonic saline (HTS) use after DCL may reduce bowel edema and resuscitation volume, leading to successful and faster PFC. Our primary objective is to determine if there is a higher rate of PFC in patients who undergo DCL when using HTS versus normal saline resuscitation.

Methods: All trauma patients requiring a DCL were randomized to receive a standard rate of either HTS or normal saline solution in this double blinded prospective study. Demographics, vital signs, laboratory values, surgical procedures, blood transfusions, PFC, and outcomes were compared.

Results: We randomized 20 patients to determine the validity of our methodology and value of continuing this research. Treatment groups (HTS, normal saline) did not differ significantly with regard to mean age ($p>0.05$), BMI ($p>0.05$), or gender ($p>0.05$). The normal saline group had a higher mean injury severity score and higher rate of blunt trauma ($p<0.05$). Both groups had similar mean trauma injury severity score (TRISS) and revised trauma score (RTS). Mean heart rate, systolic blood pressure, initial hemoglobin, INR, base deficit, and lactate were not significantly different between the two groups ($p>0.05$). No significant differences were identified between either group in regards to the peak creatinine, delta sodium, hospital days, intensive care unit and ventilator free days ($p>0.05$). The HTS and normal saline groups did not differ significantly with regard to the rate of closure.

Conclusions: There have been no prospective studies to date that compare HTS with standard crystalloid resuscitation in terms of overall volume requirements and ability to achieve PFC closure after DCL. Efforts to minimize postoperative complications are paramount for good functional outcomes. Our pilot data demonstrates HTS use is safe and feasible in DCL.

Table 1. Demographics

	Hypertonic Saline (N = 9)	Normal Saline (N = 11)	Total (N = 20)	P-value
Gender				0.09[1]
Female	0 (0)	4 (36.36)	4 (20)	
Male	9 (100)	7 (63.64)	16 (80)	
Total	9	11	20	
BMI				0.07[2]
N	9	11	20	
Mean±SD	27.79±6.1	35.21±9.71	31.87±8.93	
Median [Q1, Q3]	26.9 [25.4, 27.3]	33.5 [27.8, 40.25]	27.85 [25.85, 38.2]	
Age				0.97[3]
N	9	11	20	
Mean±SD	35.67±15.65	35.36±15.56	35.5±15.18	
Median [Q1, Q3]	31 [24, 41]	30 [22, 50.5]	30.5 [22.75, 48.75]	
ISS				**0.04[3]***
N	9	11	20	
Mean±SD	21.33±12.72	32.82±9.02	27.65±12.05	
Median [Q1, Q3]	22 [16, 34]	34 [30, 37.5]	34 [18.75, 34]	
RTS				0.86[2]
N	9	11	20	
Mean±SD	6.84±1.59	6.9±1.51	6.88±1.51	
Median [Q1, Q3]	7.84 [7.1, 7.84]	7.84 [6.44, 7.84]	7.84 [6.67, 7.84]	
Mechanism				**0.02[1] ***
BLUNT	3 (33.33)	10 (90.91)	13 (65)	
PENETRATING	6 (66.67)	1 (9.09)	7 (35)	
Total	9	11	20	
TRISS				0.59[2]
N	9	11	20	
Mean±SD	0.79±0.28	0.83±0.19	0.81±0.23	
Median [Q1, Q3]	0.95 [0.74, 0.98]	0.92 [0.8, 0.96]	0.93 [0.76, 0.96]	

Table 1. Demographics

Table 2. Outcome by Fluid Type

Outcome	Hypertonic Saline (A) (N = 9)	Normal Saline (B) (N = 11)	Total (N = 20)	P-value
Peak Creatinine				0.852
N	9	11	20	
Mean±SD	1.45±0.88	1.25±0.48	1.34±0.68	
Median [Q1, Q3]	1.29 [0.88, 1.62]	1.12 [1.02, 1.44]	1.12 [0.9, 1.6]	
PFC				11
No	1 (11.11)	1 (9.09)	2 (10)	
Yes	8 (88.89)	10 (90.91)	18 (90)	
Total	9	11	20	
Hours to PFC				0.332
N	8	10	18	
Mean±SD	37.88±33.77	37.9±14.39	37.89±24.07	
Median [Q1, Q3]	30 [23.5, 34.25]	35.5 [27.25, 47.5]	33 [25.25, 40.75]	
Hospital days				0.94
N	9	11	20	
Mean±SD	28.5±21.45	24±10.81	25.8±16.1	
Median [Q1, Q3]	25 [8, 35]	25 [16, 28]	25 [14.75, 29.75]	
Delta Na				0.723
N	9	11	20	
Mean±SD	4±7.48	3±3.66	3.45±5.56	
Median [Q1, Q3]	3 [1, 10]	3 [0.5, 4]	3 [0.75, 6.5]	
ICU free days				0.753
N	9	11	20	
Mean±SD	9.67±7.02	8.64±7.3	9.1±7	
Median [Q1, Q3]	13 [3, 15]	7 [3, 14]	9.5 [2.75, 15]	
Vent free days				0.673
N	9	11	20	
Mean±SD	11.33±8.49	13±8.64	12.25±8.38	
Median [Q1, Q3]	11 [4, 19]	14 [7.5, 20.5]	12 [5.5, 19.75]	

* P-value < 0.05, 1. Fisher's exact test, 2. Mann-Whitney U test, 3. Student's t-test.
PFC, primary fascial closure

Table 2. Outcome by Fluid Type

Notes

Quick Shots Parallel Session II
Location: Nelson Wolff Exhibit Hall A, Level 1

Quick Shot #20
January 13, 2016
1:54 pm

IT IS STILL OKAY TO THROW IN THE TOWEL: AN INSTITUTION'S OPEN ABDOMINAL EXPERIENCE WITH 1533 VACUUM PACK WOUND CLOSURES

Darren Hunt, MD *, Nicholas Drahush, MD, Donald E. Barker, MD*,
Benjamin W. Dart IV, MD*, Robert A. Maxwell, MD*, Vicente A. Mejia, MD*,
Philip W. Smith, MD*, Phillip Burns
University of Tennessee-Chattanooga

Presenter: Nicholas Drahush, MD

Discussant: Jose Diaz, MD, MPH, University of Maryland Medical Center

Objectives: The Barker "Vacuum Pack" (VP) technique for temporary abdominal wound closure has been used at our institution since 1992. This review examines our overall experience before and after implementation of a massive transfusion protocol (MTP) in May 2005.

Methods: Retrospective data review of all adult patients undergoing open abdomen management with VP closure at a single institution from January 1999-October 2013 was completed.

Results: 623 adult patients treated with 1533 VPs (244 Trauma and 379 general/vascular surgery) were included. Primary fascial closure (PFC) rate was 58.1% (60.7% general/vascular surgery, 54.1% trauma). Overall all-cause mortality rate for both groups was 28.9% and the total abdominal complication rate was 15.9%. Acute care population PFC rates and intra-abdominal complication rates remained static when compared to our previous reports; however, in the trauma population, an improvement was seen after the implementation of a MTP. Blunt trauma comprised 74.4%; penetrating 25.6%. Mean ISS was 32.2 prior to MTP; 32.6 after initiation. PFC rates for trauma patients who survived to discharge before and after MTP adoption were 58.5% and 72.1%, respectively. Average ratio of blood products for those receiving MTP was 1:0.8:0.62 (PRBC, FFP, and platelets). Overall all-cause mortality for this subset of the population was 31.8%. Average time to closure prior to and after adoption of MTP was 9.97 and 5.64 days, respectively.

Conclusions: Changes in technique and resuscitation strategy amongst the trauma population correlate with a beneficial impact on PFC rates. Institutional cost savings for utilizing the Barker VP over the KCI ABThera™ is $347 per negative pressure wound dressing. The Barker VP is a cost effective and viable alternative that compares favorably to a commercially available product.

Notes

Color Sheet

Color Sheet

Scientific Posters – Group I
Emergency General Surgery
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 1
#EAST2016P01

FACTORS PREDICTING FAILURE OF NONOPERATIVE MANAGEMENT IN COMPLICATED APPENDICITIS: AN ANALYSIS OF THE NATIONWIDE INPATIENT SAMPLE

Britt J. Sandler, BS, MHS, Kimberly A. Davis, MD, MBA, FACS, FCCM*,
Kevin M. Schuster, MD, MPH*
Yale University School of Medicine

Presenter: Britt J. Sandler, BS, MHS

Objectives: Understanding factors predictive of failed nonoperative management of complicated appendicitis may allow for earlier operative management and shorter length of stay (LOS).

Methods: The Nationwide Inpatient Sample from 2004-2011 was queried for patients ≥15 years old admitted with appendicitis complicated by perforation or abscess. Attempted nonoperative management (NOM) was defined by no surgical procedure on day 0 or 1 of admission. Failure of NOM was defined by appendectomy on day 2 or later. Factors examined were age, gender, smoking status, obesity, hypertension, chronic pulmonary disease, coronary artery disease, congestive heart failure (CHF), diabetes, and appendiceal abscess. Data were analyzed using X^2 and multivariable analysis with reverse stepwise logistic regression, $p<0.05$ considered significant.

Results: 94,104 patients with complicated appendicitis were identified. 21,356 (23%) were initially nonoperatively managed. 3,535 patients (17%) failed NOM and were eventually treated with appendectomy (89%), ileocecectomy (7%), or right hemicolectomy (12%). Female gender (OR=1.31, $p<0.001$), age >34 (OR=1.30, $p<0.001$) and a history of diabetes (OR=1.24, $p<0.001$), CHF (OR=1.54, $p<0.001$), and chronic pulmonary disease (OR=1.15, $p=0.019$) predicted failure of NOM. Patients with abscess were also more likely to fail NOM (OR=1.37, $p<0.001$). Percutaneous drainage on day 0 or 1 of admission reduced the odds of failing NOM (OR=0.29, $p<0.001$). Patients who failed NOM had a longer LOS (10.9 vs. 5.4 days, adjusted difference=4.0 days, $p<0.001$) and higher rates of sepsis, pneumonia, UTI, and respiratory failure ($p<0.05$).

Conclusions: Patients with complicated appendicitis who are female, older than 34, have a history of diabetes, congestive heart failure, or chronic pulmonary disease, or present with abscess are more likely to fail NOM and may benefit from immediate operation.

Notes

Scientific Posters – Group I
Emergency General Surgery
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 2
#EAST2016P02

THE IMPACT OF DIABETES MELLITUS ON EMERGENCY GENERAL SURGERY BURDEN AND OUTCOMES IN THE UNITED STATES: 2001-2010

Jessica Crystal, Shahid Shafi, MD, MPH*,
Viktor Dombrovskiy, MD, PhD, MPH
East Texas Medical Center

Presenter: Jessica Crystal

Objectives: We have previously shown that the burden of disease for emergency general surgery (EGS) exceeds 3 million inpatient admissions per year nationwide and is increasing. Diabetes Mellitus (DM) is known to increase the risk of surgical complications but its impact on EGS outcomes is unknown. We hypothesized that EGS patients with DM would have worse outcomes than those without it.

Methods: The Nationwide Inpatient Sample, 2001–2010, was queried for "EGS patients" using published ICD-9-CM code criteria. All patients aged ≥18 admitted as "urgent" or "emergent" were included (N=27,668,807). ICD-9-CM codes were also used to identify DM and other comorbidities. Patients with DM and without DM were compared using Chi-square, multivariate logistic regression, *t*-test, and the Cochran-Armitage trend test ($p<0.05$ was significant).

Results: The prevalence of DM among EGS patients was 21% (N=5,843,697) and increased annually from 17% in 2001 to 25% in 2010 ($p<0.0001$). Diabetics were older (64±16 vs 57±21) and were more likely to be males and minorities (26.5% vs 19.6%) ($p<0.0001$ for all) than non-diabetics. They less often required surgery (24% vs 30%) and had a 14% lower mortality rate (1.85% vs 2.14%) ($p<0.0001$ for all) during their hospitalization. However, patients with DM had higher rates of sepsis (2.9% vs 2.7%), UTI (8.9% vs 7.2%), acute renal failure (7.2% vs 4.2%) and myocardial infarction (1.03% vs 0.75%)($p<0.0001$ for all) and were hospitalized longer than those without DM.

Conclusions: Among EGS patients admitted to US hospitals over a 10-year period, the presence of diabetes mellitus was associated with lower surgical activity and lower mortality, but higher rates of severe complications during their hospitalization. Further studies using detailed clinical data, are needed to explore the complex relationship between DM and surgical outcomes in this patient group.

Notes

Scientific Posters – Group I
Emergency General Surgery
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 3
#EAST2016P03

DOES FACILITY LOCATION INFLUENCE OUTCOMES? COMPARISON OF RURAL AND URBAN PATIENTS

Adil A. Shah, MD, Cheryl K. Zogg, MSPH, MHS, Navin R. Changoor, MD,
Muhammad Ali Chaudhary, MBBS, Alyssa Chapital, Lisa M. Kodadek, MD*,
Stephanie Nitzschke, MD*, Joel S. Weissman, Joaquim M. Havens, MD*,
Ali Salim, MD*, Adil H. Haider, MD, MPH*
Brigham and Women's Hospital, Harvard Medical School and Harvard School of Public Health

Presenter: Muhammad Ali Chaudhary, MBBS

Objectives: Geographic misdistribution of surgeons between rural/urban centers has led to the creation of "surgical deserts" in rural areas. Lack of a desire to practice in rural locations combined with structural differences (size, services offered) is thought to influence patient outcomes. To examine how such a situation influences the care of emergency general surgery (EGS) patients, the study compared outcomes between rural and urban hospitals using a nationally representative sample.

Methods: The 2007-2011 NIS was queried for adult patients (≥16y) with primary EGS diagnoses, as defined by the AAST. Outcomes included: mortality, major complications, LOS, and cost. Patients were matched for differences in patient-level factors (***Table1***) using coarsened-exact-matching; risk-adjusted logistic/generalized linear models further accounted for differences in hospital factors, operative intervention, and clustering of patients. Counterfactual models examined hypothetical outcomes assuming that all patients were treated at urban centers.

Results: A total of 3,788,269 patients were included. Of 3,259 hospitals, 40.2% were rural (14.6% of patients). Relative to urban centers, rural EGS patients had 1.27 times higher odds of death (95%CI 1.23-1.31) and marginally higher costs (***Table1***). They had 5% lower risk-adjusted odds of major complications and comparable LOS. Differences in presentation are presented in ***Fig1***. Had all patients been managed at urban centers, overall odds of death would be 3.96% lower among EGS patients, while the odds of complications would increase by 0.59%.

Conclusions: EGS patients treated at rural hospitals experienced slightly worse mortality relative to patients at urban centers but fewer complications, after accounting for differences in patient-/hospital-level factors. Such findings, on a national scale, suggest areas for quality improvement initiatives designed to better the outcomes of EGS patients in rural areas.

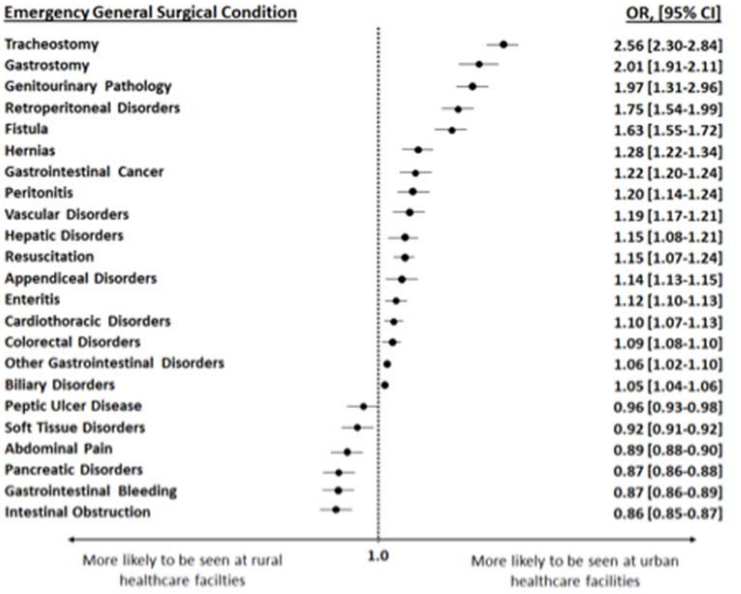


Figure 1. Relative odds of presentation with a specific EGS condition to urban healthcare facilities (rural hospitals as reference)

	Urban Hospitals (n=3,236,721)	Rural Hospitals (n=551,548)
Mortality (OR [95% CI])	0.79 [0.76-0.81]	*Reference*
Complications (OR [95% CI])	1.05 [1.04-1.06]	*Reference*
Length of Stay (Days [95% CI])[1]	4.95 [4.94-4.95]	4.55 [4.54-4.57]
Cost (2014 US$ [95% CI])[1]	11,899 [11,883-11,913]	12,735 [12,699-12,770]

[OR; Odds Ratio, CI: Confidence Interval] Coarsened-exact matching accounted for baseline differences in: age, sex, race/ethnicity, comorbidities, EGS diagnostic category, year of admission, and primary payer status. Risk-adjusted multivariable regression among matched cohorts further accounted for clustering of patients within hospitals and for differences in operative intervention and hospital-level factors: region, teaching status, bed size, and patient volume)

[1]Results represent predicted means and corresponding 95%CI taken from generalized linear models (link log, family gamma) followed by post-estimation commands

Table 1. Risk-adjusted surgical outcomes of EGS patients managed at urban versus rural hospitals

Notes

Scientific Posters – Group I
Emergency General Surgery
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 4
#EAST2016P04

PREDICTORS OF MORTALITY IN PATIENTS REQUIRING SURGERY FOR PERFORATED PEPTIC ULCER DISEASE

Brittany Fenner, Levi Procter, MD*, Andrew C. Bernard, MD*
University of Kentucky

Presenter: Brittany Fenner

Objectives: To determine co-morbid factors that are predictors of mortality in patients with perforated peptic ulcer requiring emergency surgery

Methods: A retrospective review of patients presenting between January 1, 2004 and November 13, 2013 with perforated peptic ulcer requiring surgery. Patients <18 years of age were excluded. Charts were reviewed to analyze risk factors for increased mortality. Risk factors evaluated were: age, BMI, lactate, albumin, INR, PTT, serum sodium, hemoglobin, and number of subsequent procedures required. Statistical analysis by Mann-Whitney U-test. All tests are two-sided and p values of <0.05 were regarded as statistically significant. Regression analysis was performed on all risk factors versus time to death for patients who survived less than 30 days.

Results: 135 patients were identified (58 female, 77 male). The mean age was 58. 30-day mortality was 14.60%. Multiple comorbidities were evaluated for mortality risk. The following are statistically significant ($p < 0.05$):

Mortality rate:

- 24% vs 1.72% if age > 55 vs ≤ 55
- 14% vs 12.9% if BMI <18.5 or >25 compared to normal BMI
- 21% vs 4.5% if albumin < 3.0 g/dL vs ≥ 3.0
- 28% vs 8% if hemoglobin <12 vs ≥ 12
- 35% vs 6.5% for Cr >1.5 vs ≤ 1.5

Conclusions: Patients requiring surgery for perforated peptic ulcer disease have a high risk of death. This data supports the association of several comorbid factors associated with higher mortality among those patients requiring emergency surgery for perforated peptic ulcer disease. These comorbidities include BMI, age, creatinine and hemoglobin and albumin. Further research is needed to establish a causal relationship among these comorbidities and mortality among patients undergoing surgical repair of a perforated peptic ulcer disease.

Figure 1. *Differences in Risk Factors at 30 Days Survival*

Risk Factor	Survival	Range	Mean	Median	Mode	P value
*Age**	*>30 days*	22 – 91	56.32	57	62	0.001628
	≤30 days	45 – 85	68	70	72	
*BMI**	*>30 days*	13.7 – 57.6	25.431	23.55	20.1	0.042404
	≤30 days	20.3 – 33.6	27	27	29	
Lactate	*>30 days*	0.4–9.2	2.68	2	1.8	0.2623
	≤30 days	0.7 – 8.3	3.7	3.1	3.1	
*Albumin**	*>30 days*	1.2 – 6.0	2.92	2.9	3	0.00088
	≤30 days	1.4 – 3.2	2.2	2.1	1.6	
INR	*>30 days*	0.8 – 10.0	1.28	1.1	1	0.429206
	≤30 days	0.9 – 2.1	1.2	1.2	1	
Na	*>30 days*	21 – 152	136.1	137	138	0.814514
	≤30 days	120 – 150	136	137	145	
*Creatinine**	*>30 days*	0.42 – 6.71	1.43	1.03	1	0.000844
	≤30 days	0.2 – 4.06	2.16	1.96	–	
*Hemoglobin**	*>30 days*	6.6 – 19.5	13.36	13.65	12.2	0.000366
	≤30 days	6.3 – 15.0	11.1	10.9	10.6	
Procedures	*>30 days*	1.0 – 11.0	1.38	1	1	0.38952
	≤30 days	1.0 – 4.0	1.3	1	1	

*Statistically significant

Figure 2. *Mortality Rate by Risk Factor*

Risk Factor	Criteria	Mortality Rate
Age	*≤ 55 years*	1.72%
	> 55 years	24.05%
BMI	*18.5 – 25*	
	<18.5 or >25	12.90%
Lactate	*≤ 2*	8.11%
	> 2	19.44%
Albumin	*≥ 3*	4.55%
	< 3	21.05%
INR	*≤ 1.5*	15.09%
	> 1.5	16.67%
Na	*> 130*	69.57%
	≤ 130	3.67%
Creatinine	*≤ 1.5*	6.52%
	> 1.5	35.00%
Hemoglobin	*≥ 12*	8.14%
	< 12	28.89%
Procedures	*1*	17.17%
	> 1	7.89%

Notes

Scientific Posters – Group I
Emergency General Surgery
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 5
#EAST2016P05

HIV-INFECTED PATIENTS HAVE POORER OUTCOMES FOLLOWING EMERGENCY GENERAL SURGERY: A STUDY OF THE NATIONWIDE INPATIENT SAMPLE

Britt J. Sandler, BS, MHS, Daniel Bohl, James Tooley,
Kimberly A. Davis, MD, MBA, FACS, FCCM*, Kevin M. Schuster, MD, MPH*
Yale University School of Medicine

Presenter: Britt J. Sandler, BS, MHS

Objectives: To determine the association of HIV infection with outcomes in emergency general surgery in the era of highly active antiretroviral therapy.

Methods: Retrospective cohort study of the Nationwide Inpatient Sample. Records of patients who underwent laparoscopic or open appendectomy, cholecystectomy, or colon resection after emergency admission from 2004-2011 were analyzed. Outcomes were mortality, length of stay, total charges, and selected postoperative complications (sepsis, septic shock, pneumonia, surgical site infection (SSI), wound dehiscence, cardiac arrest, myocardial infarction, hemorrhage, transfusion, pulmonary embolism (PE), respiratory failure, urinary tract infection (UTI), and acute renal failure. Data were analyzed using chi-square and multivariable regression, with $p < 0.05$ significant.

Results: 974,588 patients were identified. Of these, 1,549 (0.16%) were diagnosed with HIV. HIV-infected patients were more likely to die during their hospital stay than other patients (4.3% vs. 1.6%, adjusted OR = 3.33, 95% CI = 2.52-4.39, $p<0.001$). HIV-infected patients had longer hospital stays (10.5 vs. 5.5 days, adjusted difference = 3.8 days, 95% CI 3.50-4.04, $p<0.001$) and higher mean total charges than other patients ($83,746 vs. $44,498, adjusted difference = $30,581, 95% CI = $27,917-33,246, $p<0.001$). HIV-infected patients also had significantly higher rates of sepsis, septic shock, PE, pneumonia, acute renal failure, respiratory failure, UTI, transfusion and SSI ($p<0.05$ for each). Differences persisted irrespective of case complexity and over the study period.

Conclusions: HIV-infected patients have a greater risk of death, infectious, and non-infectious complications after emergency surgery regardless of operative complexity. Despite advancing therapy for HIV it continues to negatively impact emergency surgery outcomes.

	Mortality			
Procedure	No HIV	HIV	OR (adj.)	P-value
Laparoscopic Appendectomy	156 (0.08%)	1 (0.41%)	3.87	0.199
Open Appendectomy	**276 (0.26%)**	**3 (1.76%)**	**4.3**	**0.026**
Laparoscopic Cholecystectomy	**1,695 (0.39%)**	**15 (2.23%)**	**7.3**	**<0.001**
Open Cholecystectomy	**1,426 (2.49%)**	**8 (6.78%)**	**3.93**	**<0.001**
Laparoscopic Colon Resection	191 (1.48%)	1 (4.55%)	6.19	0.117
Open Colon Resection	**11,985 (7.1%)**	**38 (11.76%)**	**2.29**	**<0.001**
All Procedures	**15,729 (1.6%)**	**66 (4.3%)**	**3.33**	**<0.001**

	Length of Stay			
Procedure	No HIV	HIV	Beta (adj.)	P-value
Laparoscopic Appendectomy	**2.3 days**	**5.2 days**	**2.5 days**	**<0.001**
Open Appendectomy	**3.6 days**	**5.9 days**	**1.2 days**	**<0.001**
Laparoscopic Cholecystectomy	**4.2 days**	**9.2 days**	**4.3 days**	**<0.001**
Open Cholecystectomy	**8.7 days**	**14.4 days**	**4.8 days**	**<0.001**
Laparoscopic Colon Resection	8.8 days	9.9 days	0.1 days	0.937
Open Colon Resection	**12.5 days**	**18.0 days**	**4.1 days**	**<0.001**
All Procedures	**5.5 days**	**10.5 days**	**3.8 days**	**<0.001**

Mortality and length of hospital stay by procedure type. Bold indicates statistical significance.

Notes

Scientific Posters – Group I
Emergency General Surgery
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 6
#EAST2016P06

ACUTE CARE CHOLECYSTECTOMY VS ELECTIVE CHOLECYSTECTOMY: SIMILAR.....BUT DIFFERENT

Greg Hambright, Anita R. Martinez, MD
Methodist Dallas Medical Center

Presenter: Greg Hambright

Objectives: Cholecystectomy is one of the most common surgical procedures performed in the United States. This procedure is unique in that it is performed both electively and on an urgent basis. With changes in healthcare, we anticipate that patients undergoing cholecystectomy will need to be characterized by their manner of presentation. This will allow for the treating physician and his/her outcomes to be fairly evaluated in the context of public reporting.

Methods: Our database was retrospectively queried for patients who underwent cholecystectomy over a 24 month period. The patients were divided into two categories, based on whether they were admitted electively for their procedure (EL) or if they presented to the emergency department (ER). The medical records for each patient were reviewed for specific data points, which were analyzed for statistical significance.

Results: A total of 698 patients were identified. Laparoscopic cases were converted to open 12% in the ER group and 3% in the EL group ($p<0.05$). Length of the operative procedure was significantly longer in the ER group (1.67 hours vs 0.94 hours, $p<0.05$). The ER group underwent a higher number of total procedures (OR, ERCP). The average hospital length of stay for ER patients was 3.8 days, while EL patients were in the hospital 0.81 days ($p<0.05$). Postoperative complications were higher in the ER group, as were 30 day readmission rates, and total costs ($p<0.05$).

Conclusions: Patients in the ER who require cholecystectomy are fundamentally different than those who present electively. They fare worse in every category evaluated . Surgeons who primarily care ER patients need to define quality metrics for this unique population. The public reporting of this data could have a negative impact on the field of Acute Care Surgery. This data suggests the need for an acute care surgery database to define expected norms and identify areas for improvement.

Notes

Scientific Posters – Group II
Performance Improvement and Outcomes
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 7
#EAST2016P07

MULTIDISCIPLINARY COLLABORATION DECREASES THE INCIDENCE OF CATHETER ASSOCIATED URINARY TRACT INFECTION (CAUTI) IN THE SURGICAL AND TRAUMA ICU

Mamoona Arif Rahu, PhD, RN, CCRN, Deborah Burnette, Rahul Anand, MD*,
Michel Aboutanos, MD, MPH*, Paula Ferrada, MD*
Virginia Commonwealth University

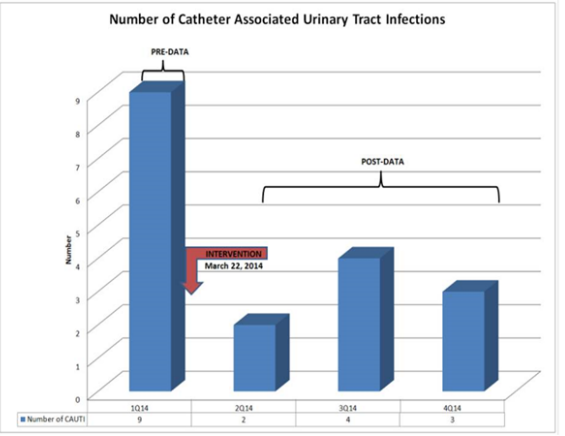
Presenter: Mamoona Arif Rahu, PhD, RN, CCRN

Objectives: Prevention of Catheter Associated Urinary Tract Infection (CAUTI) has become a major focus of health care providers, accrediting agencies, and reimbursement sources. We hypothesize that by implementing an Infection Control RN Liaison (ICRNL), as well as a bladder bundle encompassing collaboration between nursing and medical personnel, we will decrease incidence of CAUTI in the Surgery Trauma Intensive Care Unit (STICU)

Methods: The role of the ICRNL, as well as a bladder bundle, was implemented March 22, 2014 in the STICU. The bladder bundle included nursing and resident education and collaboration with daily questioning regarding catheter need. The ICRNL conducted weekly surveillance and bedside rounds to assess indwelling catheter necessity and/or use. The ICRNL created and implemented the Algorithm for Intermittent Catheterization Post Indwelling Urinary Catheter Removal and provided education to health care team members on the algorithm. Number of CAUTIs were evaluated at the end of the study period (January 2014 to December 2014).

Results: 7745 patients were admitted to the STICU during the study period and compared pre-intervention group (1Q14 - first quarter of 2014) with intervention group (2Q14, 3Q14, 4Q14). The two groups were similar in age, ICU LOS, and mechanical ventilation days. There was a significantly higher percentage of CAUTI in the pre-intervention group as compared to the intervention group ($p=0.0095$). In the pre-intervention group, CAUTI rates per 1000 device days were 7.70 days which significantly dropped by 5.71 days post implementation of ICRNL

Conclusions: Weekly surveillance of indwelling catheter necessity by the ICRNL lead to significant decrease in CAUTI rates.



Number of CAUTI

Notes

Scientific Posters – Group II
Performance Improvement and Outcomes
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 8
#EAST2016P08

THE PROBLEM OF PRECEDENCE: EXAMINING THE COMPOSITION OF THE FAILURE TO RESCUE METRIC IN TRAUMA

Daniel N. Holena, MD*, Brendan G. Carr, MD, MA, MS*, Douglas Wiebe, PhD,
Jason Christie, Patrick M. Reilly, MD*
Hospital of the University of Pennsylvania

Presenter: Daniel N. Holena, MD

Objectives: Failure to Rescue (FTR) is the conditional probability of death after a complication and has recently gained traction as an outcome metric in trauma. The performance of this metric is contingent on the precedence rate, defined as proportion of deaths preceded by complications. The FTR metric was developed elective surgical populations where the precedence rate approaches 100%. This is an important consideration, as deaths not preceded by complications have not been considered as FTR cases in published trauma literature. We hypothesized that precedence rates in trauma would be much lower than 100% and would show significant variation between centers.

Methods: We performed a retrospective cohort study of prospectively collected registry data for all patients presenting to 30 trauma centers in Pennsylvania from 2011-2014 was conducted. Mortality was defined as in-hospital mortality, while FTR was defined as the probability death after any registry-defined complication. Precedence rates were calculated as the proportion of deaths preceded by a complication at each center.

Results: A total of 118,696 patients were included (median age 49(IQR 26-73), 82% Caucasian, 60% male, 87% blunt, median ISS 9 (IQR4-13)). Overall mortality was 4.35% (center range 1.0 -8.1%), overall complication rate was 9.7% (center range 1.3-17.7%) while the overall FTR rate was 11.7% (center range 4.6 - 17.4%). The overall precedence rate was 26.1% (center range 5.9 - 41.6%) (Figure1).

Conclusions: The precedence rate varies widely between trauma centers in a single state trauma system. Only ~25% of deaths were preceded by complications indicating that the majority of deaths at trauma centers are not included when calculating FTR rates. Considering only a small subset of deaths may lead to biased estimates of trauma center quality, and development of an FTR metric specific for use in trauma cohorts is warranted.

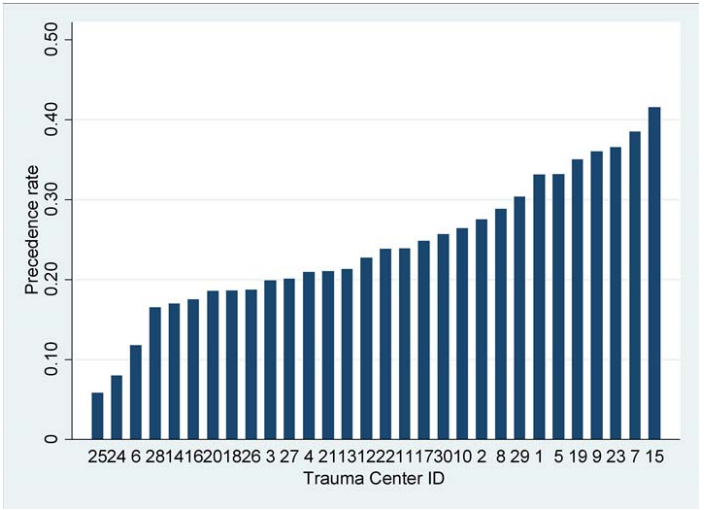


Figure 1 - Precedence rates by trauma center across a single-state trauma system.

Notes

Scientific Posters – Group II
Performance Improvement and Outcomes
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 9
#EAST2016P09

APPLICATION OF FORCED AIR WARMING SIGNIFICANTLY REDUCES HYPOTHERMIA TIME IN TRAUMATICALLY INJURED PATIENTS

Frank Zhao, MD, Christopher Mckintosh, Michael W. Cripps, MD*,
Brian H. Williams, MD, FACS*, Kareem R AbdelFattah, MD,
Christian T. Minshall, MD, PhD*, Joseph P. Minei, MD, FACS*,
Alexander L. Eastman, MD, MPH, FACS*
University of Texas Southwestern Medical Center

Presenter: Frank Zhao, MD

Objectives: The lethal triad of hypothermia, coagulopathy, and acidosis has been well described for decades. Hypothermia impedes activation of clotting factors and platelets, decreases chemotaxis, interferes with oxidative destruction of pathogens and increases the rate of surgical site infections. Forced air warming is easily accessible, but not universally utilized across the trauma patient population during the resuscitation phase. Therefore, we sought to determine if we could improve our application of forced air warming it order to decrease the hypothermic time for trauma patients.

Methods: We performed an internal quality improvement project to identify our current rewarming methods which included warmed blankets, increased ambient temperature, warmed intravenous fluid, and forced air warming. Over a one month period (December 2014), universal application of forced air warming was incorporated to our trauma rewarming protocol. We then compared hypothermic patients in the pre-intervention period (07/01/2014 to 11/23/2014) to hypothermic patients in the post-intervention period (01/01/2015 to 04/30/2015). The pre and post-intervention data was analyzed and compared using SSPS.

Results: There were 114 and 82 hypothermic patients in the pre and post-intervention groups respectively. Demographics were not different in these groups. Forced air warming utilization increased from 11% to 70% ($p=<0.0001$). The mean hypothermia time decreased by 33% from 229 min to 154 min ($p=0.003$). There were no significant differences in frequency or other types of warming methods utilized.

Conclusions: Utilization of forced air warming is an effective method to significantly reduce hypothermic time for trauma patients. Universal implementation of forced air warming can be effectively used as part of a systematic rewarming protocol and easily achieved in a short time frame (1 month) at a major Level 1 trauma center.

Methods	Pre-intervention	Post-intervention	P-value
Warmed Blankets	(110/114) – 96%	(78/82) – 95%	0.633
Ambient Temp	(82/114) – 72%	(59/82) – 72%	0.997
Warmed IV Fluids	(69/114) – 61%	(57/82) – 70%	0.157
Forced Air Rewarming	***(12/114) – 11%***	***(57/82) – 70%***	***<0.0001***
Pts Reaching 36°C	(91/114) – 80%	(70/82) – 85%	0.318
Hypothermia time	***229 min (3:49)***	***154 min (2:34)***	***0.003***

Table 1. Various rewarming intervention usage rates and overall hypothermia time in the pre and post-intervention groups.

Notes

Scientific Posters – Group II
Performance Improvement and Outcomes
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 10
#EAST2016P10

THE IMPACT OF MINOR TRAUMA ON PREGNANCY AND NEONATAL OUTCOMES

Meike Schuster, DO, Lisa M. Jaramillo, Michael J. Paglia
Geisinger

Presenter: Meike Schuster, DO

Objectives: Determine the impact of a single episode of minor trauma during pregnancy on neonatal and pregnancy outcomes

Methods: This was a retrospective cohort study involving patients with viable pregnancies (≥ 24 weeks) who experienced trauma between 2004 and 2014. Women who experienced minor trauma were matched to a control group by gestational age at the time of minor trauma, gravidity, BMI and history of preterm delivery. The primary outcomes were preterm delivery, APGAR scores and NICU admission. Frequency of abnormal lab testing at the time of trauma was also evaluated. A p-value less than 0.05 was considered significant, and a 12% baseline preterm delivery rate was used to calculate power showing a 10% difference between groups which required 500 patients in each group

Results: Risk factors for preterm delivery were analyzed with no statistical differences found. Average gestational age at the time of delivery was equal in both groups as were APGAR scores. Preterm delivery was increased in the control group (11.8% vs 7.85%) as was the rate of NICU admissions (8.6% vs 5%) which was statistically significant. A subgroup analysis was performed to evaluate the rate of spontaneous preterm delivery versus medically indicated preterm delivery which revealed that a statistical difference between the two groups in the rate of preterm delivery was not found (57.6% in the control group, 56.4 % in the case group, p-value 0.9052). A further subgrouping of the rates of preterm labor and PPROM were compared and no statistical difference was found between groups (47% vs 40% PTL, p-value 0.75; 53% vs 60% PPROM, p-value 0.75). 40% of patients in the minor trauma group underwent laboratory testing and no abnormal values were found

Conclusions: One episode of minor trauma in pregnancy does not increase the risk for preterm delivery, PPROM or poor neonatal outcomes. Laboratory test results are unlikely to be abnormal and therefore may not be necessary

	Case (n = 500)	Control (n = 500)	P-value
Gestational Age in Days, median (IQR)	275 (270, 280) 39.28 weeks	274 (267, 280) 39.14 weeks	0.1559
Gestational Age in Days at Trauma, mean (STD)	222.93 (29.88)	NA	NA
BMI, mean (STD)	29.07 (7.91)	28.96 (7.66)	0.3789
OB APGAR 1, median (IQR)	8 (8, 8)	8 (8, 8)	0.5063
OB APGAR 5, median (IQR)	9 (9, 9)	9 (9, 9)	0.7997
Placenta Abruption	5 (1.00%)	3 (0.60%)	0.7266
Pre - Eclampsia	16 (3.20%)	23 (4.60%)	0.3368
Gestational Hypertension	11 (2.20%)	13 (2.60%)	0.8388
Chronic Hypertension	20 (4.00%)	30 (6.00%)	0.1934
Advanced Maternal age	51 (10.20%)	56 (11.20%)	0.6752
Tobacco	135 (27.00%)	153 (30.60%)	0.2384
Drug Dependency	14 (2.80%)	10 (2.00%)	0.5413
Uterine anomaly	3 (0.60%)	2 (0.40%)	0.9999

Table 1 - Demographics

	Case (n = 500)	Control (n = 500)	P-value
Gestational Age in Days, median (IQR)	275 (270, 280) 39.28 weeks	274 (267, 280) 39.14 weeks	0.1559
Preterm	39 (7.85%)	59 (11.80%)	**0.0428**
NICU Admission	25 (5.00%)	43 (8.60%)	**0.0273**
OB APGAR 1, median (IQR)	8 (8, 8)	8 (8, 8)	0.5063
OB APGAR 5, median (IQR)	9 (9, 9)	9 (9, 9)	0.7997
Subgroup analysis			
Spontaneous preterm labor	20 (56.4%)	34 (57.6%)	**0.9052**
Preterm labor	10 (50%)	15 (44%)	**0.6755**
Premature rupture of membranes	10 (50%)	19 (56%)	**0.7463**
NICU Admission	62%	20%	**0.0030**
Length of time between trauma and delivery	50.77 days (SD 29.99) 35.67 days (SD 25.00) for preterm deliveries 52.05 days (SD 30.06) for term deliveries		

Lab Name	Normal range	Total number with lab results	Number of normal
APTT-PATIENT	22-37 sec	101	100 (99.01%)
FIBRINOGEN-PATIENT	178-467 mg/dL	127	45 (35.43%)
HCT	36.0-45.2%	202	43 (21.29%)
HGB	12-15.3 g/dL	202	71 (35.15%)
PLATELET COUNT	140-400 K/uL	202	189 (93.56%)
PT/INR-INR	0.85-1.16	97	93 (95.88%)

Table 2 - Results

Notes

Scientific Posters – Group II
Performance Improvement and Outcomes
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Poster 11
#EAST2016P11

UTILITY OF PROPHYLACTIC ANTIBIOTICS FOR NON-OPERATIVE FACIAL FRACTURES

Jeffrey Wild, MD*, Kelly Bridgham, Kenneth A. Widom, MD, Megan Rapp, MD,
Marie Hunsinger, James T Dove, BA, Denise Torres
Geisinger

Presenter: Jeffrey Wild, MD

Objectives: The majority of patients with facial fractures are managed non-operatively. Patients with facial fractures involving the sinus cavities are often placed on prophylactic antibiotics for 7-10 days to prevent soft tissue infection from the cavity flora. However, no literature exists that shows this practice decreases infection rates. This study aims to compare the duration of antibiotics and the incidence of soft tissue infection found in non-operative facial fractures.

Methods: This was a retrospective review of the trauma database of a rural, level 1 trauma center between 1/1/2012 and 1/1/2015. Patients admitted with non-operative facial fractures were included. Patients were categorized into three groups: group 1 received no antibiotics, group 2 received a short course (1-5 days), and group 3 received a long course (>5 days). All patients were followed through their first outpatient facial trauma clinic visit to survey for soft tissue infections. Outcomes measured include facial soft tissue infections and *C. difficile* infections.

Results: During a 3 year period, 289 patients were admitted with non-operative facial fractures. Basic demographics and ISS between the groups are found on table 1. 50 patients received no prophylactic antibiotics, 63 received 1-5 days, and 176 patients received >5 days. No patients developed facial soft tissue infections (table 2). We found no significant difference in the incidence of C. *difficile* infection between the 3 groups.

Conclusions: Our results show that a short-course or no antibiotics may be just as effective as an extended course at preventing soft tissue infection in patients with non-operative facial fractures. Although not found in our study, prophylactic antibiotics in the surgical literature have led to multi-drug resistant organisms and worse outcomes. A prospective study comparing no antibiotics to a short course in trauma patients with non-operative facial fractures is warranted.

Variable	None (n = 50)	Short Course 1 - 5 Days (n = 63)	Long Course > 5 Days (n = 176)	p value
Age	51.6 ± 21.2	52.6 ± 20.4	52.7 ± 22.4	0.95
Male	33 (66%)	45 (71.4%)	115 (65.3%)	0.67
BMI	28.3 ± 6.7	26.8 ± 5.5	27.9 ± 7.1	0.44
ISS	15.5 (9, 24)	21 (10, 29)	14 (9, 22)	0.04
GCS	15 (14, 15)	15 (9, 15)	15 (14, 15)	0.04
Facial Fracture				
MAXILLARY	19 (38%)	11 (17.5%)	22 (12.5%)	
ORBITAL	21 (42%)	18 (28.6%)	49 (27.8%)	
Both	10 (20%)	34 (54%)	105 (59.7%)	

Table 1 Patient demographics and fracture type

Variable	None (n = 50)	Short Course 1 - 5 Days (n = 63)	Long Course > 5 Days (n = 176)	p value
Soft Tissue Infection	0	0	0	n/a
C Diff	0 (0%)	0 (0%)	1 (0.6%)	0.72
LOS	3.5 (2, 9)	6 (2, 13)	3 (2, 6)	0.004

Table 2 Patient outcomes

Notes

Scientific Posters – Group II
Performance Improvement and Outcomes
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 12
#EAST2016P12

ASSOCIATION BETWEEN BODY MASS INDEX AND PATIENT OUTCOMES 3 MONTHS POST TRAUMATIC INJURY

Ann Marie Warren, Simon Driver, Sonesh Patel,
Megan Reynolds, MS, Monica Bennett, Hayden Smith
Baylor University Medical Center

Presenter: Ann Marie Warren

Objectives: Obesity is a public health issue that impacts more than 1/3 of US adults and costs $150 billion annually, however little is known about the impact of obesity on health following hospitalization for injury. The objective was to examine if Body Mass Index (BMI) during initial admission predicted health outcomes 3-months post traumatic injury.

Methods: Eligible patients admitted to a Level I trauma center March 2012 - May 2014 were approached for participation in this prospective, longitudinal study; 455 patients were consented and enrolled, of which 343 (75.3%) completed 3-month follow-up. Patients were divided into BMI categories (normal, overweight, and obese) based on height and weight at admission. Demographic and injury-related data were collected from patient charts and hospital trauma registry. Health outcomes included depression, post-traumatic stress disorder (PTSD), pain, and return to work. Logistic regression was used to predict health outcomes based on BMI category, and all models controlled for demographic and injury-related variables.

Results: Analysis was completed with 336 participants including 104 normal weight, 105 overweight, and 127 obese; 7 underweight were removed from analysis. Results from the regression analyses indicated that, relative to controls, obese patients had higher odds of screening positive for depression (OR=2.36, p=0.02) and overweight patients had lower odds of returning to work (OR=0.31, p=0.01) 3-months post-injury compared to normal weight (65% vs 40%). No significant differences were found in PTSD or pain between BMI groups.

Conclusions: Results indicate that people who are obese or overweight during hospitalization following a traumatic injury are at greater risk for depression and are less likely to return to work when compared to people who are normal weight. Efforts regarding identification and treatment of depression should be targeted at this population.

Notes

Scientific Posters – Group III
Surgical Practice and Education
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 13
#EAST2016P13

OVERSEAS ORGAN DONATION DURING WARTIME OPERATIONS: BENCHMARKING MILITARY PERFORMANCE AGAINST CIVILIAN PRACTICE

John Oh, MD*, Darren Malinoski, J. Salvador de la Cruz, MD,
David Zonies, MD, MPH, FACS, FCCM*
Portland Veteran Affairs Medical Center

Presenter: John Oh, MD

Objectives: Over the past 12 years of war in Afghanistan and Iraq, U.S. military service members who were eligible for organ donation after neurologic determination of death have selflessly donated organs overseas at a role IV military facility in Germany. The purpose of this study was to identify and benchmark organ donation outcomes from U.S. combat casualties against a civilian matched cohort in the U.S.

Methods: Data from eligible adult U.S. military organ donors at a military treatment facility in Germany were collected. All donors were combat casualties that were declared dead by standard neurologic criteria. Military donors were matched 1:3 with a civilian cohort from the U.S. United Network for Organ Sharing donor registry. Demographic variables, organs recovered, and organs transplanted were compared between groups.

Results: From 2006-2013, 40 military organ donors were compared with 120 civilian matched donors. There were no significant differences in BMI or ABO blood type. Military donors were more commonly male (100% vs 62%, $p < 0.05$) and younger (mean age 25.8 + 0.99 vs. 44.2 + 1.4, $p < 0.05$). Standard criteria donors (SCDs) comprised all of the military donors, while the civilian cohort consisted of 73 SCDs, 34 expanded criteria donors, and 9 donors after circulatory determination of death. There were more organs recovered (4.6 vs. 4.0, $p = 0.02$) and transplanted (4.2 vs 3.5, $p = 0.01$) per military donor. The military group had significantly more transplanted hearts (65% vs 29%), lungs (35% vs 18%), livers (98% vs 73%), and pancreata (48% vs 9%, all $p < 0.05$). There was no difference in the proportion of kidneys transplanted (90% vs 97%, $p = 0.61$).

Conclusions: Despite multiple logistical hurdles, organ donation at a military treatment facility overseas can be accomplished successfully with excellent outcomes. The success should serve as an example for future conflicts.

Table: Univariate analysis of military versus civilian organ donor cohort.

Organ	Military (n=40)	Civilian (n=120)	p-value
Heart			
recovered	29 (73%)	38 (32%)	<0.05
transplanted	26 (65%)	34 (29%)	<0.05
Lungs			
recovered	15 (38%)	27 (23%)	0.06
transplanted	14 (35%)	22 (18%)	0.03
Kidney(s)			
recovered	38 (95%)	114 (95%)	1.0
transplanted	36 (90%)	93 (87%)	0.61
Liver			
recovered	40 (100%)	97 (81%)	<0.05
transplanted	39 (98%)	87 (73%)	<0.05
Split Liver	5 (12%)	1 (0.8%)	<0.05
transplanted			
Pancreas			
recovered	25 (63%)	21 (18%)	<0.05
transplanted	19 (48%)	11 (9%)	<0.05

Notes

Scientific Posters – Group III
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Poster 14
#EAST2016P14

CURRENT AND DESIRED PRACTICE PATTERNS OF TRAUMA AND ACUTE CARE SURGEONS (T/ACS)

Nathan Droz, MD, Melissa L. Whitmill, MD*,
Priti Parikh, PhD, Kimberly Hendershot, MD, FACS*
Wright State University

Presenter: Nathan Droz, MD

Objectives: Resident hour restrictions and the addition of emergency general surgery (EGS) have changed how the T/ACS team functions and their work patterns. The purpose of our study is to report current practice patterns of T/ACS and compare those to desired practice patterns of the future workforce in the field (residents/fellows).

Methods: An IRB-approved electronic survey was distributed nationally to EAST members. Attendings were asked about their current work patterns; residents and fellows were asked about the work patterns they desire in a future job as a T/ACS.

Results: A total of 274 participants were analyzed (242 attendings). A comparison of current attending practices and desired resident/fellow practices is shown in Table 1. The current and desired practice patterns are very similar with a few differences. The most notable difference is that residents/fellows want to leave early on post-call days, which happens rarely in current practices. Residents/fellows also desire an attending hand-off which only occurs about half of the time in current practices.

Table 2 shows that current and desired scopes of practices are very similar, with the exception of residents/fellows having less interest in elective general surgery.

The majority of attendings have not developed innovative strategies for improving their work pattern but 68% have changed their practice pattern in the last 5 years, mostly based on the addition of EGS and changes in personnel; 34% state the change was to make the practice more attractive to those entering the T/ACS field.

Conclusions: Current attending practice patterns are similar to desired practice patterns of residents/fellows with notable differences in the areas of the post-call day, attending hand-off, and elective surgery scope of practice. T/ACS must find ways to implement changes to the current practice pattern to keep the field attractive for upcoming residents/fellows.

	Current ATTENDING Practices	Desired RESIDENT/FELLOW Practices
Academic practice	61%	50%
Size of group	94% Mod-Large group (4+ people)	100% Mod-Large group (4+ people)
Function as group (ie shared rounding responsibilities)	90%	100%
Length of call "shift"	57% 1 person/24 hour period	90% OK with 1 person/24 hr period
Calls per month	3-7 24 hr equivalents per month	4-7 24 hr equivalents per month
Post-call day	15% go home after shift 40% stay all day	47% want to go home after shift 50% want to stay to finish rounds/OR 3% want to stay all day
Structured attending hand-off	53% (face to face, verbal)	73% (face to face, verbal, no texts)
Call pay	57% have NO call pay	77% OK with NO call pay as long as base salary is good
Team Composition	88% have residents 94% have NP/PA's	93% want residents 97% want NP/PA's

Table 1: Comparison of current attending practice patterns and desired resident/fellow practice patterns

	ATTENDING Current Scope of practice	RESIDENT/FELLOW Desired Scope of practice
Trauma	99%	100%
Emergency General Surgery (EGS)	96%	90%
Trauma-ICU	90%	97%
Surgical-ICU	90%	87%
Elective General Surgery	75%	53%

Table 2: Comparison of attending current scope of practice and resident/fellow desired scope of practice

Notes

Scientific Posters – Group III
Surgical Practice and Education
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 15
#EAST2016P15

LOST IN TRANSLATION: FOCUSED DOCUMENTATION IMPROVEMENT BENEFITS TRAUMA SURGEONS

Nicole Fox, MD, MPH*, Patricia Swierczynski, Rebecca Willcutt,
Adrienne Elberfeld, Anthony Mazzarelli
Cooper University Hospital

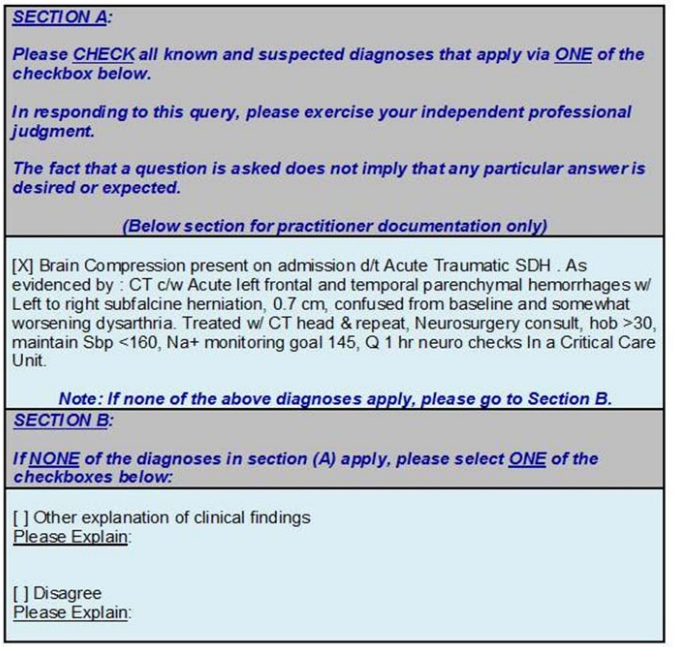
Presenter: Nicole Fox, MD, MPH

Objectives: There is a translational gap between physicians who document in the medical record and coders, who ultimately determine which codes are submitted. This gap exists because physicians are never formally educated about documentation despite the fact that the quality of physician documentation directly affects revenue, outcomes and public profiling. We hypothesized that focused documentation improvement (FDI) for trauma surgeons would bridge this gap, leading to revenue recovery and a shift in the case mix index (CMI) to accurately reflect the clinical complexity of trauma patients.

Methods: FDI is defined as targeted physician education followed by concurrent chart review for documentation improvement opportunities by a clinical documentation specialist (CDS). All trauma surgeons (n=9) at our Level 1 trauma center completed three hours of mandatory training on documentation improvement. A CDS subsequently reviewed charts of Medicare admissions to the trauma service from January-December 2014 to identify documentation improvement opportunities. Requests to clarify documentation and/or confirm diagnoses were generated. These were posted in the electronic medical record (EMR) and physicians were required to respond within 48 hours (Figure 1). Data was collected on change in CMI and revenue recovery.

Results: Medicare patients (n=776) accounted for 28% of all trauma admissions in 2014. Four hundred and eleven of 776 (57%) charts were reviewed during the study period. Opportunities for FDI were identified in 177 (43%) cases. The CMI for reviewed cases increased (1.80±0.15 v. 2.11±0.19;$p<0.001$) after FDI. Overall revenue recovery as a result of FDI was $1,132,581 with an average of $125,842±70,494 in revenue recovery/physician.

Conclusions: Efforts to improve physician documentation are beneficial as FDI resulted in significant revenue recovery and an increase in the CMI for trauma patients.



SECTION A:

Please CHECK all known and suspected diagnoses that apply via ONE of the checkbox below.

In responding to this query, please exercise your independent professional judgment.

The fact that a question is asked does not imply that any particular answer is desired or expected.

(Below section for practitioner documentation only)

[X] Brain Compression present on admission d/t Acute Traumatic SDH . As evidenced by : CT c/w Acute left frontal and temporal parenchymal hemorrhages w/ Left to right subfalcine herniation, 0.7 cm, confused from baseline and somewhat worsening dysarthria. Treated w/ CT head & repeat, Neurosurgery consult, hob >30, maintain Sbp <160, Na+ monitoring goal 145, Q 1 hr neuro checks In a Critical Care Unit.

Note: If none of the above diagnoses apply, please go to Section B.

SECTION B:

If NONE of the diagnoses in section (A) apply, please select ONE of the checkboxes below:

[ ] Other explanation of clinical findings
Please Explain:

[ ] Disagree
Please Explain:

Figure 1. Clarification Request in the EMR

Notes

Scientific Posters – Group III
Surgical Practice and Education
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 16
#EAST2016P16

TRAUMA SURGEONS SAVE LIVES - SCRIBES SAVE TRAUMA SURGEONS!

Joseph F. Golob, MD*, John J. Como, MD, MPH*, Jeffrey A. Claridge, MD, MS*
MetroHealth Medical Center

Presenter: Joseph F. Golob, MD

Objectives: With the advent of the electronic medical record, the documentation burden of the trauma surgeon has become overwhelming. To help, our trauma division added scribes to the rounding team. We hypothesized that scribe utilization would improve our documentation efficiency and offer a financial benefit to our institution.

Methods: A review of trauma surgeon documentation and billing was performed at a Level I trauma center over two time periods: January-May 2014 (no scribes) and January-May 2015 (scribes). The number of notes written by trauma surgeons was obtained, as were documentation charges. Documentation efficiency was determined by noting both the hour of the day in which inpatient progress notes were written and the number of notes written after patient discharge. The hospital charge database was queried for evaluation and management codes specific to inpatient documentation.

Results: In the 2014 period, 9726 total notes were written by seven trauma attendings. In the 2015 period, 10933 were written by eight trauma attendings. Despite there being 407 fewer trauma patient-days in the 2015 period, the group wrote 343 notes/week vs 298 notes/week ($p=0.008$). Specifically, 882 more inpatient progress notes were written with scribe assistance. More inpatient progress notes were written earlier in the working day and fewer were written in the evening hours with scribes (Figure 1). Fewer notes were written after patient discharge when utilizing scribes (12.7% vs. 8.4%). Normalized to trauma patient-days, scribe assistance increased charge capture by $32 per patient-day of documentation (Figure 2). A total of 1664 hours of scribe time was utilized over the five-month period, generating an expense of $32,787. The additional notes generated by scribes resulted in $315,756 in charges. Assuming a 20% charge reimbursement, the cost of the scribes were covered.

Conclusions: The addition of scribes to the daily trauma rounding team improved note efficiency and increased charge capture at our center.

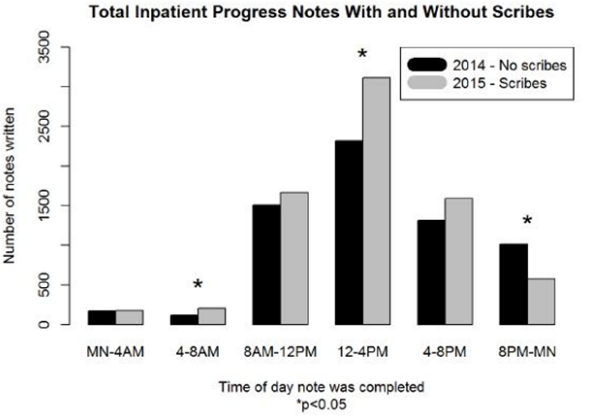


Figure 1: Time inpatient progress notes were written with and without scribe assistance. Statistically more notes are written earlier in the working day and less were written in the evening hours.

Inpatient subsequent care and critical care codes	January – May 2014 No scribes (number of charges)	January – May 2015 Scribes (number of charges)
99224	$390 (6)	$845 (13)
99225	$224 (2)	$560 (5)
99226	$0 (0)	$330 (2)
99231	$158,254 (1181)	$284,884 (2126)
99232	$237,728 (1292)	$268,456 (1459)
99233	$236,812 (811)	$200,604 (687)
99291	$917,488 (1144)	$820,446 (1023)
99292	$25,818 (78)	$12,909 (39)
Total	$1,576,714 (4514)	$1,589,034 (5354)
Trauma Patient-Days	4842	4435
Total charges normalized to trauma patient-days	$326	$358

Figure 2: Total dollars charged and number of charges with and without scribes. Normalized to trauma patient-days, scribe utilization increased inpatient documentation charge capture $32.00 per trauma patient-day.

Notes

Scientific Posters – Group III
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Poster 17
#EAST2016P17

COMFORT WITH UNCERTAINTY IS INHERENT TO ACS SURGEONS AND DOES NOT CHANGE WITH EXPERIENCE: EAST MEMBERS SURVEY RESULTS

Bishwajit Bhattacharya, MD*, Adrian A Maung, MD*, Kevin M. Schuster, MD, MPH*, Kimberly A. Davis, MD, MBA, FACS, FCCM*
Yale University School of Medicine

Presenter: Bishwajit Bhattacharya, MD

Objectives: Acute care surgery (ACS) is a demanding profession that is by its nature unpredictable and requires practitioners to routinely deal with uncertainty and stress. We hypothesized that the field attracts people who are comfortable working in such an environment and their comfort with uncertainty would increase with experience. A surgeon's stress to uncertainty can be assessed using the previously validated Physician Reaction to Uncertainty Scale (PRU scale).

Methods: After approval from our IRB and EAST Research-Scholarship Committee, an online survey was sent to EAST members. The survey included demographic questions and the PRU scale. The PRU scale requires answering 15 questions on a scale of 1-6 (strongly disagree to strongly agree) with four subsections measuring anxiety to uncertainty, concern about outcomes, reluctance to disclose uncertainty to patients, reluctance to disclose mistakes to physicians. The higher the score the greater the discomfort. Survey requests were sent to 1707 members - 424 were complete and used for analysis.

Results: Most respondents were surgeons (92.4%) and male (77.1%). Average total score was 40.4/90. Overall discomfort to uncertainty on the PRU scale did not vary with gender (p=.88), experience (p=.11), age (p=.21) or practice location (p=.26). With increased experience, there was decreased reluctance to disclose uncertainty to patients (p=.03) and a trend to decreased anxiety about outcomes (p=0.09).

Conclusions: Overall discomfort to uncertainty among ACS providers appears to be inherent in their personality and does not change over a career span. This factor may play a role in the development of occupational stress since discomfort with uncertainty appears to persist over time. Future studies looking at other surgical specialties in comparison and longitudinal studies may provide insight into the personality of the community.

Experience (years)		Anxiety due to Uncertainty Sub Total	Concern About Outcomes Sub Total	Reluctance to Disclose uncertainty to Patients Sub Total	Reluctance to disclose mistakes to Physicians Sub total	Total Score
In Training	Mean	14.4	10.0	14.4	4.6	43.3
	N	22.0	22.0	22.0	22.0	22.0
	Std. Deviation	5.7	3.5	2.9	2.4	11.3
< 2	Mean	15.0	9.4	12.8	3.1	40.3
	N	35	35	35	35	35
	Std. Deviation	5.2	4.0	2.6	1.5	10.3
2-5	Mean	15.8	9.3	14.2	3.6	42.9
	N	58	58	58	58	58
	Std. Deviation	5.7	3.4	2.8	1.8	10.0
6-10	Mean	15.0	8.7	13.8	4.0	41.5
	N	94	94	94	94	94
	Std. Deviation	5.3	3.8	2.7	1.8	10.4
11-20	Mean	13.8	8.4	13.4	3.4	39.0
	N	116	116	116	116	116
	Std. Deviation	5.6	3.8	2.7	1.7	10.3
>20	Mean	14.5	8.1	13.0	3.6	39.2
	N	97	97	97	97	97
	Std. Deviation	6.2	3.6	2.7	2.1	11.5
Total	Mean	14.7	8.7	13.5	3.7	40.5
	N	422	422	422	422	422
	Std. Deviation	5.7	3.7	2.7	1.9	10.7
	p	0.353	0.096	0.029	0.023	0.114

Notes

Scientific Posters – Group III
Surgical Practice and Education
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 18
#EAST2016P18

THE ANATOMY OF NURSING INTERRUPTIONS IN A SURGICAL INTENSIVE CARE UNIT AT A TRAUMA CENTER

Pratik Parikh, PhD, Nicole C. Craker, BA, MPH, Robert A. Myers, MSE, Jessy Eid,
Priti Parikh, PhD, Kathy Zink, Mary C. McCarthy, MD*
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Presenter: Robert A. Myers, MSE - @fixineer

Objectives: Although interruptions experienced by nurses during intensive care have been indicated to affect patient safety, not much is known regarding the complex situations that drive interruptions to eventually aid in intervention design and implementation. Our objective, thus, is to understand the anatomy of interruptions; i.e., source (person or device), location, activity performed, inquiry, and their interactions that affect the duration of an interruption and switch from the primary activity.

Methods: We observed registered nurses (RNs) in a 23-bed surgical intensive care unit (SICU) at a Level 1 Trauma Center in the Midwest US. Multiple RNs were shadowed for 25 sessions for a total of 75 hours between June and September 2014. A total of 206 interruptions were recorded for two outcomes (interruption duration and switch from primary task), which were analyzed using statistical methods.

Results: RNs were interrupted on average every 18.3 min; mean duration of interruption being 99.8 s. The dominant location was patient room (57.8%), activity was documentation (42.2%), and inquiry was professional communication (56%). Interruptions by attending/residents were less frequent (10%), but significantly longer than the more frequent (30%) caused by other RNs (197.1 vs 74.8 seconds; $p<0.01$). Long durations (although less frequent) led to a higher proportion of switches (correlation, $r = 0.64$). Individually, devices, hall, documentation, and inquiry in form of a task led to significantly higher switches. Interaction between these factors were detrimental; e.g., duration was long by interruption from attending/resident during documentation (202.5 vs. 93.5 s, $p=0.0238$); switches were higher when in the hall (87.5% vs 49.5%, $p=0.0368$).

Conclusions: This work shows that a deeper understanding in the anatomy of interruptions, and the emerging complex situations through their interaction, is imperative. Operational protocols can be devised to avoid such situations from occurring, unless it is benefiting the patient.

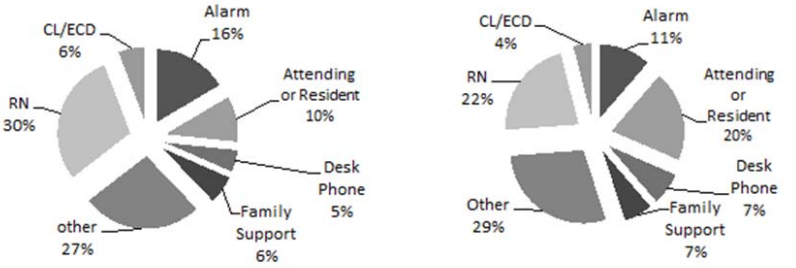

Figure 1. Frequency (left, *n*=206) and duration (right, % of 342 total interrupted minutes) of interruptions for each source (person and device); CL = call light, ECD = electronic communication device.

Figure 1. Frequency (left, *n*=206) and duration (right, % of 342 total interrupted minutes) of interruptions for each source (person and device); CL = call light, ECD = electronic communication device.

Table 2. Situations (modeled via two-way interaction effects) affecting duration and switch; *n*/*q* indicates events and mean (seconds) for duration or events and percentage switched (%) for switch

	Situation		**Situation**	***p*-value**
		Duration (s)		
Person + Activity	*Attending/Res + Documentation (12/202.5 s)*	greater than	*Other situations (194/93.5 s)*	0.0238
Person + Location	*Attending/Res + Hall (8/258.0 s)*		*Other situations (198/93.4 s)*	0.0301
Device + Activity	*Alarm + Documentation (19/55.2 s)*	less than	*Other situations (187/104.3 s)*	0.0323
		Switches (%)		
Person + Location	*Attending/Res + Hall (8/87.5%)*	greater than	*Other situations (198/49.5%)*	0.0368
Device + Activity	*Alarm + Documentation (19/84.21)*		*Other situations (187/47.6%)*	0.0019
Person + Location	*RN + Patient Room (31/25.8%)*	less than	*Other situations (175/55.4%)*	0.0020

Table 2. Situations (modeled via two-way interaction effects) affecting duration and switch; *n*/*q* indicates events and mean (seconds) for duration or events and percentage switched (%) for switch

Notes

Scientific Posters – Group III
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Poster 19
#EAST2016P19

REPLACEMENT OF A SWINE MODEL: DESIGN OF A COST EFFECTIVE HEMODYNAMICALLY ADJUSTABLE MODEL (HAM) FOR REBOA SIMULATION

Benjamin A. Keller, MD, Timothy Williams, Edgardo S. Salcedo, MD*, Lucas Neff, Anthony J. Carden, MD, Yiran Li, Oren Gotlib, Nam Tran, Joseph Galante, MD
University of California, Davis

Presenter: Benjamin A. Keller, MD - @bakeller

Objectives: Resuscitative endovascular balloon occlusion of the aorta (REBOA) is an adjunct technique to salvage patients with non-compressible torso hemorrhage. Current REBOA training paradigms require large animals or human cadavers for acquisition of skills. This adds cost and logistical obstacles to training that may prevent widespread dissemination of REBOA. We propose the development of a low-cost, near-physiologic REBOA simulator, replacing the need for costly animal models.

Methods: A REBOA simulator was designed and assembled. Pulsatile perfusion was achieved using a Harvard Apparatus pump and the anatomic vascular circuit was constructed out of latex and PVC tubing. Retrograde balloon occlusion was achieved using a Cook Coda balloon catheter. Pressure sensors were placed in the proximal aorta and distal iliac artery for pressure monitoring and arterial tracings were obtained.

Results: A pulsatile simulator capable of generating cardiac outputs ranging from 1.7-4.5 liters per minute with corresponding arterial pressures of 89-184/65-121 mm Hg was successfully created. The simulator accommodates an introducer sheath compatible with the Coda balloon catheter. Upon inflation of the REBOA catheter, the arterial waveform distal to the occlusion flattens and distal pulsation within the simulator is lost. Systolic pressures proximal to the inflated occlusion balloon increase by 62 mm Hg, simulating the ability to increase proximal perfusion when the catheter is deployed.

Conclusions: We have designed a cost effective simulator capable of producing near physiologic blood pressure and flow dynamics that respond in real time to balloon catheter manipulation. Further development and validation of this simulator will allow for refinement, reduction, and replacement of large animal models for training purposes, facilitating lower cost, high fidelity simulation and widespread application of REBOA.

Notes

Scientific Posters – Group III
Surgical Practice and Education
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Poster 20
#EAST2016P20

FACTORS ASSOCIATED WITH THE DECISION TO WITHDRAW CARE IN CRITICALLY INJURED PATIENTS ADMITTED TO THE ICU

Fadi M. Balla, MD, Kristina Booth, Prasenjeet Motghare, Cindy Moore, Tabitha Garwe, PhD, Aaron Scifres, Pamela Roberts, Jason S. Lees, MD*
The University of Oklahoma Health Sciences Center

Presenter: Fadi M. Balla, MD

Objectives: Between 10-20% of trauma patients admitted to the ICU will eventually die but little is known of the epidemiology and injury patterns of those who die from withdrawal of care (WOC). Up to 42% of trauma mortality may be the result of WOC and these end-of-life decisions can be emotionally and financially trying for families. Injury severity, race, and gender may influence the decision to withdraw care in neurology ICU patients and several studies have investigated factors related to oncologic WOC. We present the only study exclusively investigating trauma ICU deaths from WOC. The purpose of our study is to investigate factors associated with WOC in trauma ICU patients.

Methods: This is a retrospective case-control study with cases being WOC deaths in the ICU and controls being non-WOC deaths. All trauma related deaths from 2010-14 were examined at an ACS verified level 1 trauma center. Only patients who died after admission to ICU were included. Demographic and clinical characteristics were compared between the two groups.

Results: Of the 14,267 total trauma patients seen at our institution, 712 (4.9%) died. 239 (33.6%) died in the ED and were excluded leaving 473 (66.4%) ICU deaths. Of the 473 ICU deaths, 169 (35.7%) underwent WOC. Those undergoing WOC were significantly ($p<0.05$) more likely to be male, white, older, have sustained a motor vehicle accident, had longer hospital stay and ventilator days, and have severe chest injury (AIS≥3). Head injury (AIS≥3) was not different between groups. Non-WOC deaths were more likely to be transfused a greater number of blood products.

Conclusions: There are distinct differences in demographic and clinical characteristics between WOC and non-WOC patients. Knowledge of these differences may aid with early goal directed discussions regarding end-of-life care, thus helping both families and physicians avoid significant emotional and financial burden.

Notes

Scientific Posters – Group IV
Trauma Systems and Prevention
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Poster 21
#EAST2016P21

LATE MIDDLE AGE (55-65): AT THE INTERSECTION OF COMORBIDITY AND HIGH-RISK ACTIVITY

Stephen C. Gale, MD*, Jo Ann Peters,
Viktor Dombrovskiy, MD, PhD, MPH, John D. Berne, MD*
East Texas Medical Center

Presenter: Stephen C. Gale, MD

Objectives: Late middle age (55-64) represents the watershed between young and elderly patients and carries unique changes in physical and social stature. While the elderly are known to have poorer outcomes after injury, little is known regarding outcomes for those injured in late middle age (LMA). We sought to characterize our LMA injured population and compare outcomes for this group to both younger and older patients in rural setting.

Methods: The East Texas Level 1 Trauma Center database was queried for all patients admitted from July 2008 to June 2013. Demographics, injury details, comorbidities and outcomes were compiled and compared. T-test and Fisher's exact test were used; $p<0.05$ was significant.

Results: During the 5-year study period, 6479 patients were admitted; 765 (11.2%) were LMA. Compared the other groups, injury characteristics (mechanism, injury pattern, and ISS) for LMA patients more closely mirrored younger patients (n=3748) while demographics and comorbidities were similar to older patients (n=1966). Interestingly, LMA patients had the highest rate of alcohol abuse (12.9%). Mortality for LMA patients (4.6%) fell between the other groups, while complication rates, hospital charges, and length of stay were all highest among for LMA patients.

Conclusions: Late middle age patients have similar risk factors and injury patterns to younger patients while exhibiting the high comorbidity rates seen in the elderly. Injuries appear to exact a higher toll on this population and require greater resource utilization. Targeted outreach may be of benefit for injury prevention and to identify societal contributors. Future prospective studies across environments are needed to validate our findings.

	< 55	55-64	≥65
# of patients	3478	765	1966
Mechanism of Injury			
MVC	*35.7%	22.1%	*13.6%
MCC	*7.2%	11.6%	*0.8%
ATV/etc	24.4%	18.7%	*6.5%
Fall	*14.6%	35.2%	*75.4%
GSW	5.4%	3.1%	*0.8%
Comorbidities			
Alcohol	9.7%	12.9%	*3.1%
Tobacco	29.2%	24.3%	*9.1%
HTN	*8.1%	37.8%	54.9%
DM	*4.1%	20.9%	24.5%
COPD	*1.4%	7.1%	10.9%
Morbid Obesity	5.3%	9.2%	5.7%
Injuries			
Injury Severity	11.6±9.1	11.5±8.6	*10.2±6.6
Brain Injury	21.3%	23.8%	25.1%
Rib Fracture	18.8%	21.7%	*11.9%
Abdominal	13.2%	12.2%	*5.6%
Pelvic Fracture	9.9%	9.4%	7.3%
Spine Fracture	25.1%	23.5%	*16.5%
Spinal Cord Inj	4.1%	3.7%	2.2%
Complications			
Infectious	8.4%	10.2%	8.1%
Cardiac	*1.1%	2.2%	2.8%
Total	29.6%	33.2%	*23.9%
Outcomes			
Mortality	3.1%	4.6%	5.8%
LOS	7.4±9.5	8.2±9.6	*6.7±6.3
*p<0.001 vs LMA group			

Notes

Scientific Posters – Group IV
Trauma Systems and Prevention
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Poster 22
#EAST2016P22

RECURRENT VIOLENT INJURY

Elinore J. Kaufman, MD, Mucio Delgado, Kristin Rising, Douglas Wiebe, PhD
University of Pennsylvania

Presenter: Elinore J. Kaufman, MD - @ElinoreJKaufman

Objectives: While many clinical interventions and research studies have focused on reducing recurrent violent injury, the true magnitude of this problem is unknown. Prior single-center studies have reported recurrence rates varying from 0.8% to 44%. Risk factors for recurrence are also not well established. We used a state-wide, all-payer database to identify the incidence of and risk factors for recurrence after an initial violent injury at the population level.

Methods: We performed a retrospective cohort study of all ED visits for violent injury in Florida from 1/2010-12/2012 using the AHRQ State ED and Inpatient Databases, which together capture all visits to non-federal EDs. We assessed clinical and demographic risk factors for recurrence with logistic regression models and estimated time to recurrence with the Kaplan-Meier method.

Results: Of 53,933 patients presenting to 188 hospitals for violent injury in 2010, 9.9% recurred during the study period. Factors associated with lower odds of recurrence included female sex (OR 0.7; $p<0.001$), Hispanic race (OR 0.7; $p<0.001$), rural residence (OR 0.8; $p<0.001$), and injury severity >=25 (OR 0.5; $p=0.03$). Factors associated with increased odds included homelessness (OR 2.1; $p <0.001$); low income (OR 1.2; $p<0.001$); Medicare, Medicaid or lack of insurance (OR 1.64, 2.07, 1.87; $p<0.001$) ; and comorbid ED visits for alcohol, substance abuse, mental illness, or unintentional injuries (OR 2.62, 1.6, 1.8, 2.2; $p<0.001$). (Table) Median time to recurrence was 6 months. (Figure) Of recurrers, 57% presented to a different hospital for their second injury.

Conclusions: Over 3 years, 9.9% of violently injured patients recurred. The highest risk individuals were the homeless and those with comorbid visits for mental and behavioral health. Contrary to some past research, young age and black or Hispanic race did not increase odds of recurrence. Clinicians can use these risk factors to target violence prevention efforts to those with greatest need.

	OR	95% CI	P value
Race			
White	Ref		
Black	1.1	1.0, 1.1	0.151
Hispanic	0.7	0.7, 0.8	<0.001
Asian/Pacific Islander	0.7	0.4, 1.1	0.120
Native American	1.2	0.6, 2.5	0.668
Other	0.9	0.7, 1.2	0.445
Female	0.7	0.6, 0.8	<0.001
Age			
<18	Ref		
18-34	1.3	1.2, 1.5	<0.001
35-54	1.3	1.2, ,1.5	<0.001
≥55	1.0	0.8, 1.1	<0.001
Insurance type			
Medicare	1.6	1.3, 1.9	<0.001
Medicaid	2.1	1.8, 2.3	<0.001
Private	Ref		
Uninsured/other	1.9	1.7, 2.1	<0.001
Low income (by zipcode median income)	1.2	1.1, 1.3	<0.001
Homeless	2.1	1.6, 2.6	<0.001
Rural residence	0.8	0.8, 0.9	<0.001
Injury severity score			
<15	Ref		
15-24	1.0	0.7, 1.4	0.84
≥25	0.5	0.2, 0.9	0.030
Admitted to the hospital at index injury	0.8	0.7, 0.9	0.001
Other visits			
Mental health	1.8	1.7, 1.9	<0.001
Substance abuse	1.6	1.4, 1.8	<0.001
Alcohol abuse	2.6	2.4, 2.9	<0.001
Unintentional injury	2.2	2.1, 2.3	<0.001

Table: Risk Factors for Recurrent Violent Injury

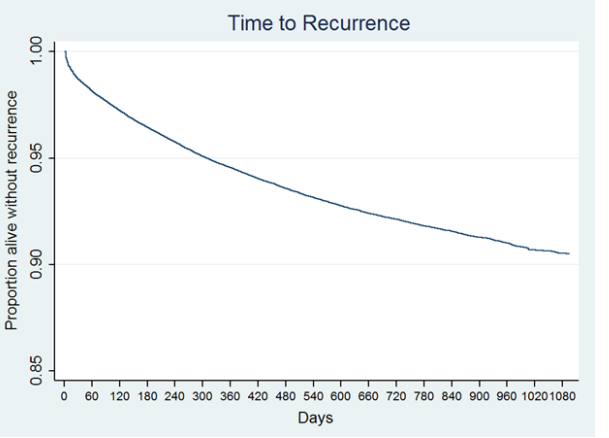

Figure: Time to Recurrence

Notes

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Poster 23
#EAST2016P23

PAIN IS AN INACCURATE PREDICTOR OF TOURNIQUET EFFICACY

Jonathan D. Alterie, Andrew J. Dennis, DO, FACS, FACOS*, Adil Baig,
Ann Impens, Kimberly T. Joseph, MD*, Thomas A. Messer, MD*,
Kimberly K. Nagy, MD, FACS*, Stathis Poulakidas, Frederic L. Starr, MD*,
Dorion E. Wiley, MD*, Faran Bokhari, MD, MBA, FACS, FACP*
JHS Cook County Hospital

Presenter: Jonathan D. Alterie - @JonathanDominck

Objectives: Based on anecdotal experience with tourniquet (TQ) application in training, significant pain is commonly associated with successful arterial vascular occlusion. We hypothesize that pain may be a suitable substitute in place of Doppler for confirmation of successful vascular inflow occlusion in training.

Methods: Three tourniquet systems (Pneumatic tourniquet, CAT® and SWAT™) were used to occlude the arterial vasculature of left and right upper arms, forearms, and the right thigh and calf of healthy volunteers between the ages of 20-40. A 4MHz handheld Doppler sonogram (MedLine, Mundelein, IL) was used to confirm successful occlusion with each application at the radial or posterior tibial artery. Once successful occlusion was noted (max 45-60 seconds), subjects rated their pain on a 0-10 numerical pain scale.

Results: Figure 1 illustrates the mean pain values with each TQ model at each anatomical site.

Conclusions: Despite anecdotal evidence to the contrary, successful TQ applications to both the upper and lower extremities need not induce severe pain in order to achieve efficacy. In this study pain was worse in the thigh compared to the upper extremities and calf however average pain consistently remained less than five for all limbs. Contrary to our hypothesis, the use of pain as an indicator for successful arterial vascular occlusion does not appear to be an appropriate substitute tool to Doppler. Additionally, over-tightening of TQs may be common and can lead to adverse circumstances such as nerve and muscle injury. Based on this, the authors recommend the use of distal Doppler signal loss and not pain as a means of validating successful arterial vascular occlusion with TQ in training.

	Pneumatic	CAT®	SWAT™
	Mean(SD) Pressure: mmHg	**Mean (SD) # of Turns**	**Mean(SD) Length used: cm**
Left Upper Arm	1.56 (1.53)	1.5(1.63)	2.68 (1.73)
Left Forearm	1.63 (1.48)	1.15 (1.14)	1.92 (1.30)
Right Upper Arm	1.7 (1.73)	1.35 (1.67)	2.57 (1.76)
Right Forearm	1.58 (1.39)	1.15 (1.08)	1.84 (1.52)
Right Thigh	3.18 (1.62)	3.42 (1.84)	3.65 (2.15)
Right Calf	2.75 (1.98)	2.25 (1.71)	2.25 (1.71)

Notes

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Poster 24
#EAST2016P24

GEOSPATIAL ANALYSIS OF VIOLENT CRIME AND TRAUMA SYSTEM UTILIZATION

Caleb J. Mentzer, DO, James R. Yon, MD*, Steven Ballesteros, Nathaniel Walsh,
P. Benson Ham III, Asif Talukder, Adil Abuzeid, Steven B. Holsten, Jr., MD*,
Regina Simione Medeiros, DNP, MHSA, RN*
Medical College of Georgia at Georgia Regents University

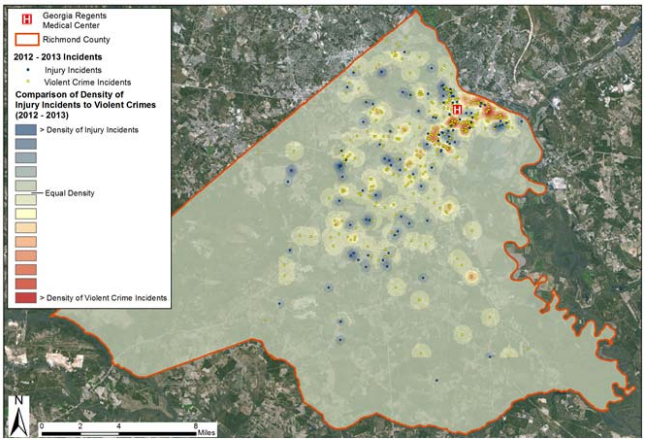
Presenter: Caleb J. Mentzer, DO

Objectives: Descriptive epidemiologic and geographic analysis utilizing geographic information science (GIS) has been used to describe trauma system utilization and to spatially describe patterns of trauma and crime. We examined the relationship between spatial components of criminality and injuries in order to evaluate optimal trauma center location and determine a correlation between violent crime and trauma system utilization.

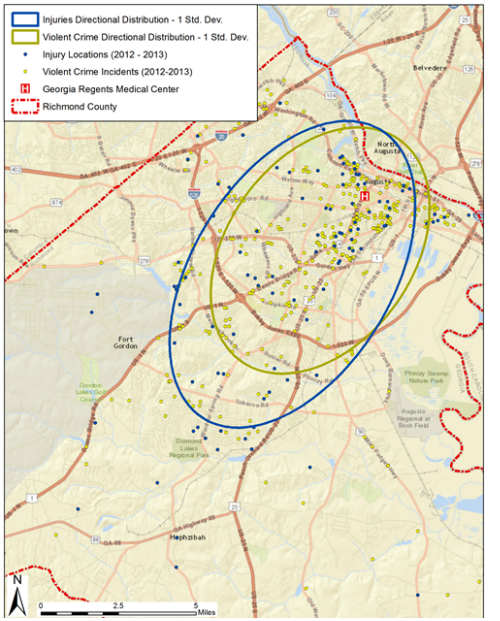
Methods: Retrospective reviews of a trauma registry and a law enforcement database were completed. All adult trauma and violent crime (VC) encounters in a defined area over a single year were included. Demographics, injury characteristics, and crime data were mapped. Geospatial statistics pattern analysis tools of Median Center (MC) and the Average Nearest Neighbor analysis (ANNa) were used to determine if mapped points occurred in complete spatial randomness or were clustered in a significant pattern.

Results: ANNa of VC resulted in a z-score of -20.54 and a p-value of <0.001, indicating a <1% likelihood that violent crimes were distributed randomly. ANNa of injuries yielded a z-score of -5.67 and p-value of <0.001. Our trauma center is 1.45 miles from the MC of VC and 2.28 miles from the MC for injuries. The distance between MC of VC and the MC of injury was 0.85 miles. While the overall directional distributions exhibited a nonrandom pattern, spatial autocorrelation failed to demonstrate a direct point to point relationship between criminality and trauma system utilization with a z-score of 0.030 and p-value of 0.98.

Conclusions: Clusters of injury and violent crime exist in a clear pattern within our area and our institution is well positioned to respond. GIS is a powerful tool for the trauma surgeon, and examination of the local-regional patterns of trauma should be undertaken by health systems to assist with optimizing outreach, expansion, and response times.



Geographic representation of reported injuries and violent crime within Richmond County, Ga represented as density



Directional distribution of reported injuries and violent crime showing a statistically nonrandom pattern.

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Poster 25
#EAST2016P25

GEOGRAPHIC DISTRIBUTION OF TRAUMA SERVICES IN THE UNITED STATES: DOES AVAILABILITY CORRESPOND TO PATIENT NEED?

Arturo J. Rios Diaz, MD, David Metcalfe, LLB MBChB, Olubode A. Olufajo, MD, MPH,
Mansher Singh, Cheryl Zogg, Andrea Moscoso, Wei Jiang,
Adil H. Haider, MD, MPH*, Edward Caterson, Ali Salim, MD*
Harvard Medical School

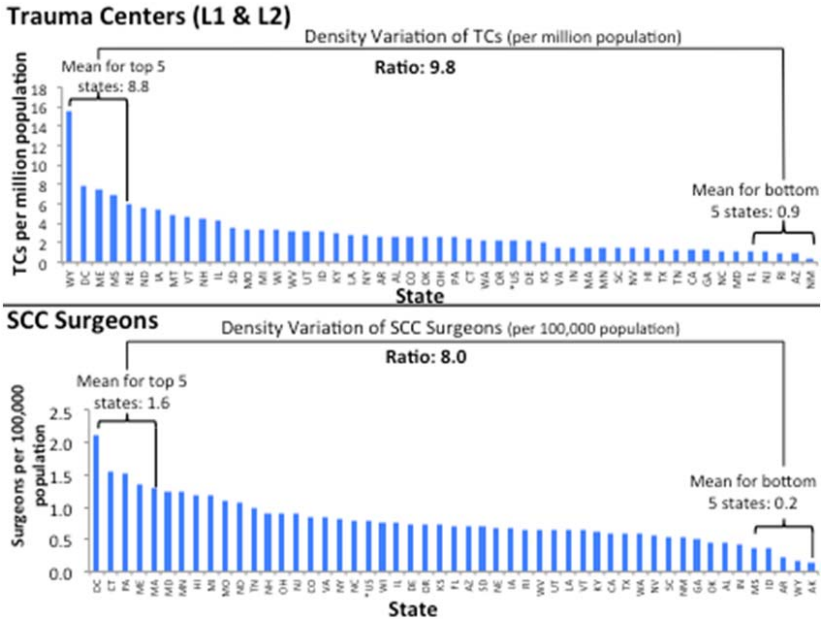
Presenter: Arturo J. Rios Diaz, MD - @ArturoRiosMD

Objectives: To compare the geographic distribution of burden of major trauma, trauma centers (TC), surgical critical care (SCC) surgeons and per capita income across the United States (US).

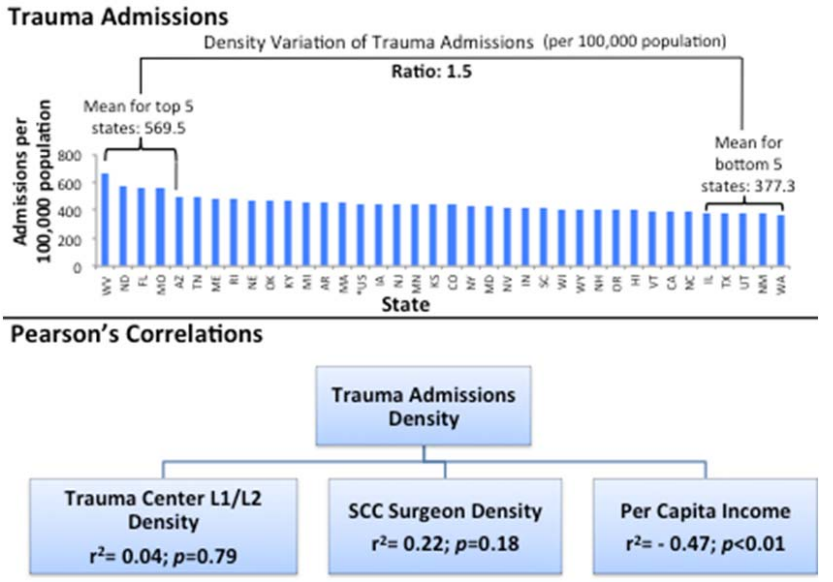
Methods: 2012-2013 data on trauma admissions, hospitals, board certified-SCC surgeons and per capita income were obtained from publicly-available sources, including databases of the Agency for Healthcare Research and Quality (national/state inpatient), American Hospital Association, American Board of Medical Specialties and US Census Bureau. Pearson correlation coefficients were used to examine ecological state-level associations between the density of trauma admissions and (1) TC Level 1 (L1) and Level 2 (L2) per 1 million, (2) SCC surgeons per 100,000 population and (3) per capita income.

Results: Need based assessment determined a burden of 1,398,935 annual trauma admissions and 445 trauma admissions per 100,000 population. 1,674 TC were identified in the US: 16.2% L1 and 25.4% L2; yielding a nationwide density of 2.2 L1/L2 TC per 1 million population. On a national scale, there were 2,496 SCC surgeons, with a density of 0.78 surgeons per 100,000 population. State-level analyses reveal that there was substantial variation between states in terms of TC L1/L2 and SCC surgeon availability (Fig. 1) despite showing little variation in the incidence of trauma requiring hospital admission (Fig. 2). Correlation coefficients for the relationships between density of trauma admissions and (1) L1/L2 TCs, (2) SCC surgeons, and (3) state-level per capita income were 0.04, 0.22, and -0.47 respectively (Fig. 2).

Conclusions: Uneven distribution of trauma services across the US does not correlate with state-level variations in clinical need. States with lower per-capita incomes appear particularly underserved. In the wake of efforts to regionalize TC across the US, efforts are needed to redress discrepancies as they appear.



Surgical critical care (SCC) surgeons (per 100,000 population) and trauma centers level 1 and 2 (per 1 million population) by state



Trauma admissions (per 100,000 population) by state and its correlation with (1) density of trauma centers (level 1 and 2), (2) density of surgical critical care (SCC) surgeons and (3) per capita income

Notes

Scientific Posters – Group IV
Trauma Systems and Prevention
Location: Nelson Wolff Exhibit Hall Foyer, Level 1

Poster 26
#EAST2016P26

THE IMPACT OF A STANDARDIZED STATEWIDE PRE-HOSPITAL TRIAGE SYSTEM ON TRAUMA TRANSFERS

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Presenter: Peter A. Zmijewski, MD

Objectives: The WV trauma system continues to evolve. In 2009, statewide, standardized criteria for pre-hospital triage were introduced. This study was to evaluate the impact of standardized triage criteria on pts transferred in WV.

Methods: The statewide trauma registry was queried for all pts at state trauma centers (Level I – IV) for years 2007/2008 (PRE) and 2010/2011 (POST) implementation of standardized criteria. 2009 was the implementation year and data was excluded. $p < .05$ was considered significant.

Results: 11,181 pts were in the PRE group and 11,419 pts in the POST group. There was an ↑ in pts transported directly to Level 1 centers [63.5% (PRE) vs 71% (POST), p<.0001]. Pts transported to Level III center ↓ [36.5% (PRE) vs 28.8% (POST), p <.0001]. Helicopter use for scene transport ↓ [12.8% (PRE) vs 10.4% (POST), p<.0001]. Pts transported from scene direct to Level I or II via helicopter ↓, 14.2% (PRE) vs 11.4% (POST), p<.0001. The # of pts requiring transfer to a higher level of care ↓, 10.6% (PRE) vs 9.78% (POST), p<.04. Interfacility transfer via helicopter ↓ 8.8% (PRE) vs 6.7% (POST), p<.03. Of transferred pts, there was an ↑ in mechanically ventilated pts, [4.3% (PRE) vs 6.48% (POST), p<.0001]. ED LOS ↑, [188 min (PRE) vs 196 min (POST), p<.0001]. However the # of pts discharged home from the ED ↑ [25% (PRE) vs 30% (POST), p<.0001].

Conclusions: Conclusions: Standardized, statewide trauma triage criteria had a positive effect. Pts requiring transfer from a Level III to a higher level of care ↓ while there was an ↑ of pts taken from scene to a Level I/II. Helicopter use for scene or interfacility transfer ↓, despite an ↑ in # of aircraft in WV during the same period. ED LOS did ↑, but # of pts discharged to home also ↑. This may reflect longer work ups in the ED to complete evaluation and R/O injury. Study limitations include: it is retrospective and includes only hospitals participating in the state system.

Effects of Implementation of Standardized Triage Protocol on Trauma Transfers in the State of West Virginia by Year			
	2007-2008 (%)	2010-2011 (%)	P value
Direct transport to Level I	63.5	71	<0.0001
Primary helicopter transport	12.8	10.4	<0.0001
Primary helicopter transport to Level I/II	14.2	11.4	<0.0001
Transfer to higher level of care	10.6	9.8	<0.04
Mechanically ventilated transfer patients	4.3	6.5	<0.0001
ED LOS	188	196	<0.0001
Discharge from the ED	25	30	<0.0001

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Trauma and Hemorrhage
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END-TIDAL CO2 ON ADMISSION PREDICTS THE NEED FOR MASSIVE TRANSFUSION AS DEFINED BY CRITICAL ADMINISTRATION THRESHOLD: A PILOT STUDY

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Presenter: Edward Chao, MD

Objectives: Critical administration threshold (≥3 units of packed red blood cells/hour or CAT+) has been proposed as a new definition for massive transfusion (MT) that includes volume and rate of blood transfusion. CAT+ has been shown to eliminate survivor bias and be a better predictor of mortality than the traditional MT (>10 units/24 hours). End-tidal CO_2 (ETCO2) negatively correlates with lactate and is an early predictor of shock in trauma patients. We conducted a pilot study to test the hypothesis that low ETCO2 on admission predicts CAT+.

Methods: ETCO2 via capnography and serum lactate were prospectively collected on admission for 102 patients requiring trauma team activation. Demographic data was obtained from patient charts. Excluded were patients with isolated head injuries, traumatic arrests, or prehospital intubations. CAT+/- status as described was determined for each hour up to 6 hours from admission as described; likewise, MT+/- status was determined up to 24 hours from admission.

Results: After exclusion criteria, 67 patients were analyzed (Table 1): mean age 41.2+/-18.5; blunt mechanism of injury (MOI) 33(49.2%); median Injury Severity Score (ISS) 9 (IQR 4-19); and 6 deaths (9%). ETCO2 negatively correlated with lactate(R=-0.303, p=0.01). Twenty (29.85%) and 8 (11.49%) patients were CAT+ and traditional MT+, respectively. Table 2 shows a significantly greater proportion of patients with ISS>15, ETCO2<35, or who died were found to be CAT+. A binomial logistic regression model adjusting for age, systolic blood pressure (SBP), MOI, and ISS revealed ETCO2<35 to be independently predictive of CAT+(OR 9.41, 95% CI 1.47-60.25, p=0.018).

Conclusions: This pilot study demonstrated that low ETCO2 was predictive of patients meeting CAT+ criteria in the first 6 hours after admission. Further study to verify these results and to elucidate CAT criteria's association with mortality will require a larger sample size.

Table 1. Study Cohort Demographics (N=67)

Mean Age	41.2 +/-18.5
Male	51 (76.1%)
Blunt Trauma	33 (49.2%)
Median Admission GCS	15 (IQR 14-15)
Median ISS	9 (IQR 4-19)
ISS>15	19 (28.4%)
Mean Respiratory Rate	20.1 +/-4.2
Mean End Tidal CO_2	33.64 +/-8.499
Median Lactate mmol/L	2.98 (IQR 1.72-5.79)
SBP < 90 mmHg	9 (13.4%)
Massive Transfusion Protocol Initiated	14 (20.9%)
Traditional Massive Transfusion Criteria (≥ 10 units/24hrs) met (MT+)	8 (11.9%)
Critical Administrations Threshold (≥ 3 units/hour) met (CAT+)	20 (29.9%)
Mean # of Units PRBC/24 hours	3.45 +/-6.12
Median Length of Stay (days)	4.1 (IQR 1.8-12.3)
24 hour Mortality	2 (3.0%)
In-hospital Mortality	6 (9.0%)

Table 2. Comparison of MT+ vs. MT- and CAT+ vs. CAT- patients

	MT(+) (n=8)	**MT(-) (n=59)**	p-value	**CAT(+) (n=20)**	**CAT(-) (n=47)**	p-value
Mean Age	59.1+/-20.5	38.8+/-17.0	p=.0029	46.5+/-20.1	39.0+/-17.5	p=.117
Blunt Trauma	7 (88%)	26 (44.1%)	p =0.0272	10 (50.0%)	23 (40.4%)	p=0.6003
ISS>15	7 (87.5%)	12 (20.3%)	p=0.0004	13 (65.0%)	6 (10.5%)	p =<0.0001
SBP<90 mmHg	2 (25.0%)	8 (13.6%)	p=0.3413	5 (25.0%)	5 (8.8%)	p=0.1148
$ETCO_2$< 35 mmHg	7 (87.5%)	33 (55.9%)	p=0.1302	16 (80.0%)	24 (42.1%)	p=0.0174
Lactate > 4 mmol/L	4 (50.0%)	18 (30.5%)	p=0.4231	7 (35.0%)	12 (21.1%)	p=0.2377
Mortality	3 (37.5%)	3 (5.08%)	P=0.0195	5 (25%)	1 (1.75%)	p=0.0039

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VACUOLATED POLYMORPHONUCLEAR NEUTROPHILS ON A STANDARD PERIPHERAL BLOOD SMEAR DIRECTLY CORRELATE WITH LACTATE LEVELS IN HEMORRHAGIC SHOCK TRAUMA PATIENTS: A CASE CONTROL STUDY.

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Presenter: Joao B. Rezende-Neto, MD, PhD, FACS

Objectives: The presence of vacuolated PMNs for more than 36 hours in septic patients correlates with mortality. However, little is known about that finding in trauma patients with hemorrhagic shock (HS). Our objectives were to define the progression of PMN vacuolization in HS patients through Wright-Giemsa stain of peripheral blood smears. Furthermore, given the importance of lactate in trauma, we assessed the correlation between PMN vacuolization and blood lactate levels.

Methods: Consecutive penetrating trauma patients (n=20) in severe HS (SBP<90mmHg) were compared to 20 control patients with minor chest trauma. Wright-Giemsa peripheral blood smears were performed at admission and every 6 hours until 24 hours; subsequently, every 24 hours until 72 hours. Photomicrographs of the smears, magnified 1000 times, were processed with an image analysis software to determine the number and the area (μ^2) of the vacuoles in the cytoplasm and in the nucleus of the PMNs. CBC, coagulation profile, and biochemical assays were performed during all time points.

Results: The average number of vacuoles in the control PMNs was significantly lower ($p<0.05$) in both the cytoplasm and the nucleus compared to HS group in all time points. Vacuolization peaked at 12 and 24 hours post-trauma in HS patients, and at 12 and 72 hours in controls. HS group also had significantly larger vacuoles in the cytoplasm during those time points. Serum lactate, WBC, and heart rate were significantly higher ($p<0.05$) in HS patients. Multivariable linear regression analysis showed significant correlation between lactate and heart rate, with the number and the area of the vacuoles in the cytoplasm of PMNs.

Conclusions: HS provokes PMN vacuolization with two peak times (12 and 24 hours). Moreover, serum lactate and heart rate directly correlated with that finding.

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PELVIC FREE FLUID ON CT OF THE ABDOMEN AND PELVIS: STILL A SIGNIFICANT FINDING?

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Presenter: Amy Hildreth, MD

Objectives: Computed tomography (CT) with intravenous contrast has become standard in the assessment of abdominal and pelvic injury in blunt trauma. Pelvic free fluid on CT without solid organ injury is thought to indicate potential hollow viscus injury. Patients with this finding often undergo operative intervention or admission for serial abdominal exams. We theorize that, in light of improved CT technology, pelvic free fluid is seen frequently and, without other CT abnormalities, is seldom indicative of bowel injury.

Methods: The trauma registry at our Level I trauma center was queried for all blunt trauma patients from 2011 and 2012 with CT scans of the abdomen and pelvis performed on the day of admission. We recorded all CT scan findings and identified those patients for study inclusion who had pelvic free fluid in the absence of solid organ injury or other abnormal intraabdominal finding. Chart review was then performed to determine whether bowel injury was ultimately diagnosed.

Results: Two thousand seven hundred seventy seven patients evaluated during the study period had a CT of the abdomen and pelvis on the initial day of presentation. Of those, 226 patients (8.1%) had pelvic free fluid without other findings: 107 were male (47%); 119 were female (53%). One of 226 (0.4%) required intervention for bowel injury. This patient had free fluid in the pelvis, but in a more cepahald location than in the remainder of cases.

Conclusions: In our population, a CT finding of free fluid without other associated findings was present frequently and did not routinely indicate the presence of bowel injury or other intraabdominal process requiring intervention. Approximately half with pelvic free fluid were male; free fluid in this population has not previously been considered physiologic. We propose that patients with this CT finding alone without significant abdominal exam findings do not benefit from admission or serial abdominal exams.

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SELF-EXPANDING FOAM FOR RESCUE FROM ABDOMINAL EXSANGUINATION: A QUANTITATIVE HUMAN FACTORS ASSESSMENT ON CIVILIAN AND MILITARY END-USERS. CAN WE TEACH OTHERS?

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Presenter: Upma Sharma, PhD

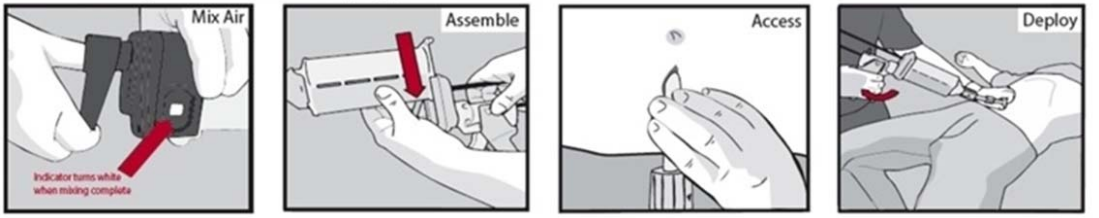
Objectives: ResQFoam is a self-expanding polyurethane foam used as a rescue maneuver for exsanguinating abdominal hemorrhage. The objective of this study was to evaluate the effectiveness of an accelerated training program for end-users to ensure appropriate foam administration outside of our expert development team.

Methods: Physicians and non-physician healthcare providers, with no prior exposure to self-expanding foam, were recruited from military and civilian end-user populations. The 2 hour accelerated training program involved 70 minutes of didactic and hands-on training, a 20-question quiz to confirm training comprehension, and a graded foam injection into a mannequin (divided in 14 critical individual tasks). Task successes, failures, and "close calls" were assessed. Close calls were defined as tasks completed successfully without performance failure, but with difficulty or confusion.

Results: The user population consisted of 10 (37%) physicians and 17 (63%) non-physicians healthcare providers; 12 (44%) military and 15 (56%) civilian, trained in two cohorts. All completed the written quiz with a score above 90%. In the 1st cohort (n=12), 147 successes (88%), 18 close calls (11%), and 1 error (1%) were observed out of 168 observed tasks. Average procedure time was 5:02 min (2:56-9:37 min range). The single error highlighted a deficiency in training and materials were updated. In the 2nd cohort (n=15), 193 successes (92%), 17 close calls (8%), and no errors (0%) were observed out of 210 observed tasks (Figure 1). Average procedure time was 4:04 min (3:07-5:16 min range).

Conclusions: A quantitative human factors evaluation of self-expanding foam confirmed that usability can be exported to naïve end-users successfully within a representative population. End-users can be successfully trained in an accelerated 2 hour program.

Figure 1: ResQ Foam procedural steps. (A) Users mix air into device by rotating crank until indicator turns white; (B) assemble cartridge onto delivery handle; (C) access abdomen with delivery nozzle; (D) attach cartridge to nozzle and deploy foam.



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#EAST2016P31

MESENCHYMAL STEM CELLS LOCATE AND DIFFERENTIATE TO THE TRAUMA SITE IN A BLUNT RAT LIVER TRAUMA MODEL

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Presenter: Mostafa Alhabboubi, MBBS

Objectives: The liver heals remarkably after different forms of injuries. However, healing time can be lengthy following high grade blunt injuries. We hypothesize that injected bone marrow derived mesenchymal stem cells (BMDS) could locate and differentiate to hepatocytes after blunt trauma using a rat liver trauma model.

Methods: Blunt liver trauma was induced to male Lewis rats. BMDS were extracted from Lewis rats' femurs and transfected with LacZ retrovirus so that they express B-galactosidase enzyme, giving their nuclei a blue color on light microscopy. Each rat received a single dose of BMDS (n=6 x 106) within 24 hours of trauma. Route of injection was the tail vein (TV) in 10 rats, the portal vein (PV) in 8 rats and directly to the injured liver (DI) in 6 rats. Rats were euthanized at 2, 7 and 14 days after injection of BMDS. Livers were harvested and examined under light microscopy to identify the BMDS.

Results: Liver sections showed localization and active migration of BMDS to trauma sites in the PV group euthanized at 48 hours (3/5 rats) (Figure 1). Furthermore, some stem cells differentiated to hepatocytes. Although with fewer cells, similar findings were present in 1/3 rats euthanized at 7 days in the PV group. There was no evidence of BMDS localization in TV and DI groups. Cellular debris was found in multiple areas around the trauma sites in 3/10 and 5/6 rats in TV and DI groups, respectively (Table 1).

Conclusions: BMDS can locate and differentiate to hepatocytes at blunt trauma site and may contribute to liver regeneration process. Portal vein injection of BMDS has emerged as the most effective method of delivery to the liver following trauma among different delivery methods studied. This technique has the potential to become an effective therapeutic strategy to improve liver regeneration after severe blunt trauma. Methods of optimizing homing to injured tissue and evaluation of differentiated stem cell functionality are future areas of research.

	Number of rats per group	Time of Euthanasia Days (# of rats)	Findings
Portal vein group (PV)	8	2 (5)	In 3 out of 5 rats, stem cells were found in multiple sites adjacent to the trauma area. Some cells differentiated into liver-like cells.
		7 (3)	Stem cells were found around the trauma area in the first rat. Some differentiated into liver-like cells. Multiple degenerated stem cells with traces of blue staining were found in the second rat. Cellular debris was found in the third rat.
Tail vein group (TV)	10	2 (6)	Cellular debris was found in 3 out of 6 rats
		7 (3)	No stem cells were identified
		14 (1)	No stem cells were identified
Direct injection group (DI)	6	2 (3)	Cellular debris was found in 3 rats
		7 (1)	Cellular debris was found in this rat
		14 (2)	Cellular debris was found in one rat

Table 1: Details of the groups and findings associated with each group.

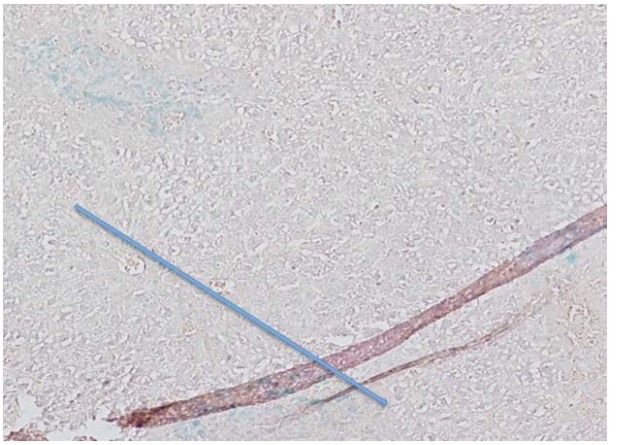

Figure 1: A sample for a rat of the PV group euthanized at two days. Stem cells are seen exiting from around a vessel and migrating to the trauma area (blue arrow), some stem cells differentiated to hepatocytes.

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THE RED BLOOD CELL STORAGE LESION IS PH DEPENDENT

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Presenter: Alex L. Chang, MD

Objectives: Transfusion of packed red blood cells (pRBCs) is essential during resuscitation after hemorrhage. Prolonged storage of packed red blood cells induces a series of harmful biochemical and metabolic changes known as the red blood cell storage lesion. Red blood cells are currently stored in an acidic storage solution (AS-3, pH 5.8), but the effect of pH on the red blood cell storage lesion is unknown. We investigated the effect of storage pH on the red blood cell storage lesion and on erythrocyte survival after transfusion.

Methods: Murine pRBCs were stored in Additive Solution 3 under standard conditions (pH 5.8), acidic conditions (AS3/pH 4.5), or alkaline conditions (AS3/pH 8.5). Units were stored up to 14 days (the murine equivalent to 42 days in humans) then analyzed. Several red blood cell storage lesion components were determined, including cell-free hemoglobin (Hgb), microparticle (MP) production, phosphatidylserine (PS) externalization, and lactate accumulation. Oxidative damage was measured by thiobarbituric acid reactive substances (TBARS) assay. Erythrocytes were labeled with carboxyfluorescein (CFSE) and transfused into healthy mice to determine cell survival.

Results: As compared to pRBCs stored in standard AS3, cells stored in AS3/pH 8.5 exhibited decreased hemolysis (cell-free Hgb 0.50 vs. 0.82 g/dL, $p=0.01$), PS externalization (29.6% vs. 48.7%, $p<0.01$), MP production (1.23×10^4 vs 2.49×10^4/μL, $p=0.03$) and lipid peroxidation (TBARS 22.3 vs 84.8 pmol/μL, $p<0.01$). Lactate generation was greater at a high pH (21.24 vs 14.58 meq/L, $p<0.01$) suggesting that these cells remained more metabolically viable. Storage in AS3/pH4.5 accelerated erythrocyte deterioration. As compared to standard AS3 storage, circulating half-life of cells was increased by AS3/pH8.5 but decreased by AS3/pH4.5 (Figure 2).

Conclusions: Our data suggest that storage pH significantly affects the quality of stored red blood cells and cell survival following transfusion.

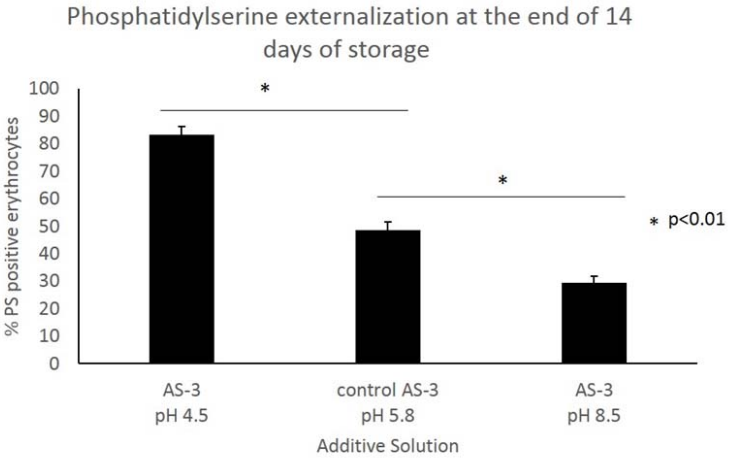

Figure 1: Phosphatidylserine externalization, a marker for eryptosis, is increased at lower pH.

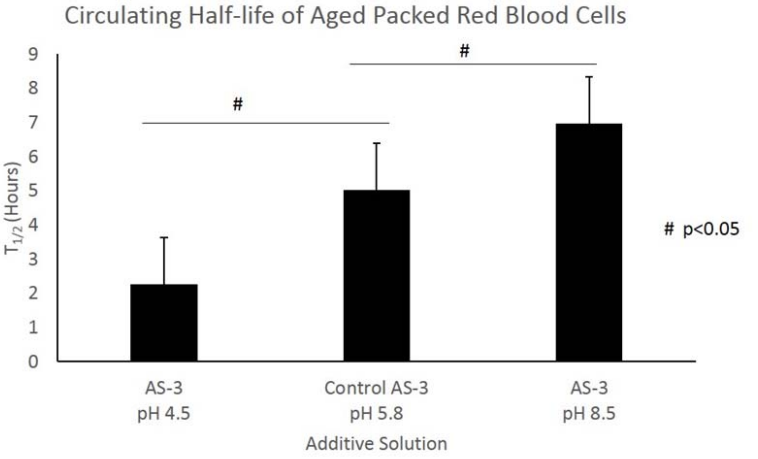

Figure 2: Erythrocytes stored at lower pH have significantly shorter half-life in circulation following transfusion.

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Scientific Posters – Group VI
Trauma-TBI and Thoracic
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#EAST2016P33

DOES ARGININE VASOPRESSIN EXACERBATE CEREBRAL EDEMA AFTER TRAUMATIC BRAIN INJURY?

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Juliet J. Ray, MD, Jonathan Jagid, M. Ross Bullock, MD, PhD,
Nicholas Namias, MD*, Carl I. Schulman, MD, MSPH*, Kenneth G. Proctor, PhD
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Presenter: Jonathan P. Meizoso, MD - @jpmeizoso

Objectives: Arginine vasopressin (AVP) is commonly used as an alternative pressor to catecholamines (CAT); unlike CAT, AVP has powerful antidiuretic actions. AVP contributes to cerebral edema after experimental traumatic brain injury (TBI), but there are no data in humans. We tested the hypothesis that AVP promoted cerebral edema and/or increased osmotherapy use, relative to CAT, in TBI patients.

Methods: We reviewed data on 286 consecutive patients with intracranial pressure (ICP) monitors admitted to a large American College of Surgeons verified level I trauma center from 09/2008-01/2015. Clinical parameters and fluid requirements were retrospectively reviewed. Cerebral edema was assessed by computed tomography using the gray white ratio (GWR) calculation method, where a low GWR indicates the presence of cerebral edema. Significance was assessed at $p \leq 0.05$.

Results: To maintain cerebral perfusion pressure > 60 mmHg, 205 patients required no vasopressors, 41 received a single CAT, 12 received AVP, and 28 required both CAT and AVP. Those who required no pressors were generally less injured, required less osmolar therapy and less total fluid, had lower plasma sodium, lower ICP, less cerebral edema, and lower mortality (all $p<0.05$). Cerebral edema, daily sodium levels (mean, minimum and maximum), and mortality were similar with AVP vs. CAT, but the daily requirement of mannitol and hypertonic saline were reduced by 45% and 35%, respectively (both $p<0.05$).

Conclusions: This is the first radiographic and clinical evidence to suggest that exogenous AVP does not promote cerebral edema and in fact decreases the use of osmotherapy relative to CAT in TBI patients.

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#EAST2016P34

TIMING OF VENOUS THROMBOEMBOLISM PROPHYLAXIS IN SEVERE TRAUMATIC BRAIN INJURY: A PROPENSITY-MATCHED COHORT STUDY

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Sunnybrook Health Sciences Center

Presenter: James P. Byrne, MD - @DctrJPByrne

Objectives: Severe traumatic brain injury (sTBI) is a predictor of venous thromboembolism (VTE). Nonetheless, pharmacologic VTE prophylaxis (VTEP) is often delayed out of concern for extension of intracranial hemorrhage. The purpose of this study was to determine the efficacy of early vs. late VTEP in patients with sTBI, and to characterize risk of subsequent intracranial complication.

Methods: Data on adults with isolated sTBI (headAIS≥3 and totalGCS≤8) were derived from ACS TQIP for 2012–2014. Patients receivingVTEP with low-molecular weight or unfractionated heparin were identified, excluding early (<72h) deaths/discharges. Patients were divided into those who received early prophylaxis (EP, <72h) or late prophylaxis (LP, ≥72h). We used a matched propensity design to adjust for selection bias, with each patient in the EP group matched to a patient in the LP group on demographics, injury characteristics, intracranial lesions, and early neurosurgical procedures. The primary outcome was pulmonary embolism (PE). Secondary outcomes included major intracranial complications (ICC) and death. ICC was defined as late neurosurgical intervention (craniotomy/ectomy or intracranial monitor placement after 48h) occurring after starting VTEP.

Results: We identified 4,106 patients with sTBI. Median time to starting VTEP was 77h (IQR 45–139). Patients with higher head AIS, subdural hematoma, subarachnoid hemorrhage, blood transfusion <12h and early neurosurgery were more likely to receive LP. A well-balanced propensity-matched cohort of 2,918 patients was created. EP was associated with a significantly lower rate of PE compared to LP (0.84 vs 2.0%, P=0.008). There was no significant difference in rates of ICC or mortality between groups.

Conclusions: In patients with sTBI, EP is associated with lower risk of PE, and may be safe, with no significant increase in risk of major intracranial complication or death.

Outcome	Early VTE Prophylaxis (n = 1,459)	Late VTE Prophylaxis (n = 1,459)	Adjusted OR† (95% CI)
Thromboembolic Complication			
Pulmonary embolism (%)	12 (0.82)	29 (2.0)	0.41 (0.21 – 0.81)
Late Neurosurgical Intervention			
Craniotomy/craniectomy (%)	36 (2.5)	24 (1.6)	1.4 (0.82 – 2.4)
Intracranial monitor placement (%)	23 (1.6)	17 (1.2)	1.2 (0.62 – 2.3)
Death	151 (10)	117 (8)	1.2 (0.93 – 1.5)

VTE, venous thromboembolism; OR, odds ratio; CI, confidence interval
† Calculated using mixed multilevel model accounting for paired nature of propensity-matched groups and clustering of patients within trauma centers

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EARLY ANTITHROMBOTIC THERAPY IS SAFE AND EFFECTIVE IN BLUNT CEREBROVASCULAR INJURY WITH SOLID ORGAN INJURY AND TRAUMATIC BRAIN INJURY

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University of Tennessee Health Science Center - Memphis

Presenter: Charles P. Shahan, MD

Objectives: Early antithrombotic therapy (AT) is the mainstay of treatment in the management of blunt cerebrovascular injury (BCVI). In spite of this, optimal timing of initiation of AT in patients with BCVI in the presence of concomitant traumatic brain injury (TBI) or solid organ injury (SOI) remains controversial. The purpose of this study was to evaluate the impact of early initiation of AT on outcomes in patients with BCVI and TBI and/or SOI.

Methods: Patients with BCVI and concomitant TBI and/or SOI over 6 years were identified. Aspirin and/or clopidogrel or low-intesity heparin infusion (AT) was instituted in all patients immediately upon diagnosis of BCVI. Cessation of AT, worsening TBI, need for delayed operative intervention, ischemic stroke, and mortality were reviewed and compared. Worsening of TBI or delayed operative intervention for SOI were compared to patients without BCVI treated at the same institution over the study period.

Results: 119 patients (74 TBI, 26 SOI, and 19 combined) were identified. 71% were treated with heparin infusion (goal aPTT 45-60 seconds) and 29% received antiplatelet therapy alone. Compared to patients without BCVI, there was no difference in worsening of TBI (7% vs 10% with no BCVI, p=0.34) or need for delayed operative intervention for SOI (3% vs 5% with no BCVI, p=0.54). No patients required cessation of AT. A total of 11 (9%) of the patients experienced a BCVI-related stroke.

Conclusions: Initiation of early AT for patients with BCVI and concomitant TBI or SOI does not increase risk of worsening TBI or SOI above baseline. Close monitoring is required, but appropriate antiplatelet or heparin therapy should not be withheld in patients with BCVI and concomitant TBI or SOI. In fact, prompt treatment with either antiplatelet or heparin therapy remains the mainstay for prevention of stroke-related morbidity and mortality in these patients.

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#EAST2016P36

POSTERIOR PARAMEDIAN SUBRHOMBOIDAL ANALGESIA VS. THORACIC EPIDURAL ANALGESIA FOR MULTIPLE RIB FRACTURES

Casey L. Shelley, DO, BS, Melissa Thepthepha, Niaman Nazir, Stepheny Berry, MD, James Howard, Tracy J. McDonald, MSN, RN, CCRN, NEA-BC, Annemarie Dalton, Michael Moncure, MD*
The University of Kansas School of Medicine - Kansas City

Presenter: Casey L. Shelley, DO, BS

Objectives: To evaluate if patients with multiple acute rib fractures would benefit from the standard of care, thoracic epidural analgesia (TEA), vs. posterior paramedian subrhomboidal (PoPS) analgesia.

Methods: In a prospective trial at a Midwestern level I trauma center from 2010-2014, 30 patients with ≥3 rib fractures had a PoPS or a TEA placed. PoPS catheters were tunneled into the paraspinal musculature by a trauma surgeon or an anesthesiologist, while anesthesia staff alone placed TEAs. Ropivicaine 0.2% was infused in both devices. Data was collected including patients' pain level, adjunct morphine equivalent use, adverse effects, length of stay, number of ventilator days, lung volumes, discharge disposition, and DVT prophylaxis dosing. Non-parametric tests were utilized and two-sided p-values <0.05 were considered statistically significant.

Results: Patients received TEA 19/30 (63%) or PoPS 11/30 (37%). On initial day of placement, pain rating was lower in the PoPS group (2.5 vs. 5, p=0.03). Although not statistically significant, patients with PoPS reported less pain overall and used less morphine equivalents. Hypotension (SBP ≤90) occurred in 8 patients, 75% with TEA and only 25% with PoPS. Standard ICU VTE prophylaxis dosing was used in patients with PoPS compared to reduced dosing in patients with TEA. No difference was found in number of ventilator days, length of stay, lung volumes, or discharge disposition.

Conclusions: In patients with rib fractures, PoPS analgesia may provide pain control equivalent to TEA while being less invasive and more readily placed by a variety of hospital staff. Additionally, fewer patients with PoPS had hypotension, and patients with PoPS overall used fewer narcotics and were able to receive full dose VTE prophylaxis. This pilot study is limited by its small sample size, and therefore additional studies are needed to prove equivalence of PoPS compared to TEA.

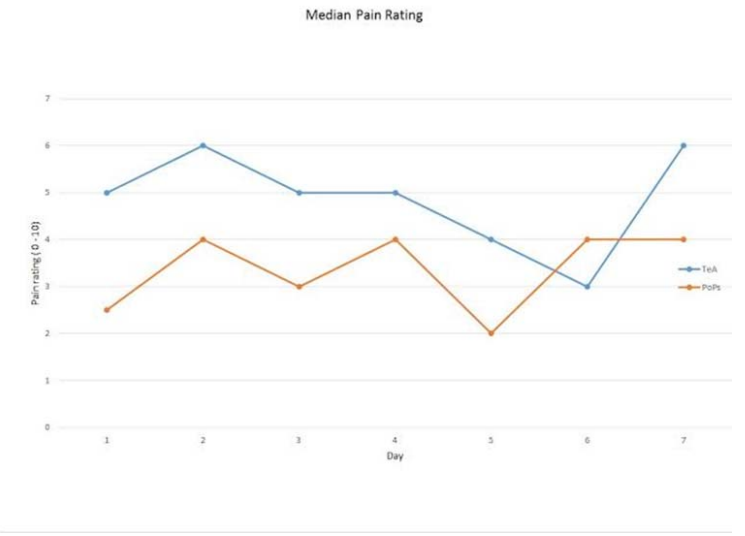

Figure 1 shows the median pain level rated by patients daily on a scale from 0-10.

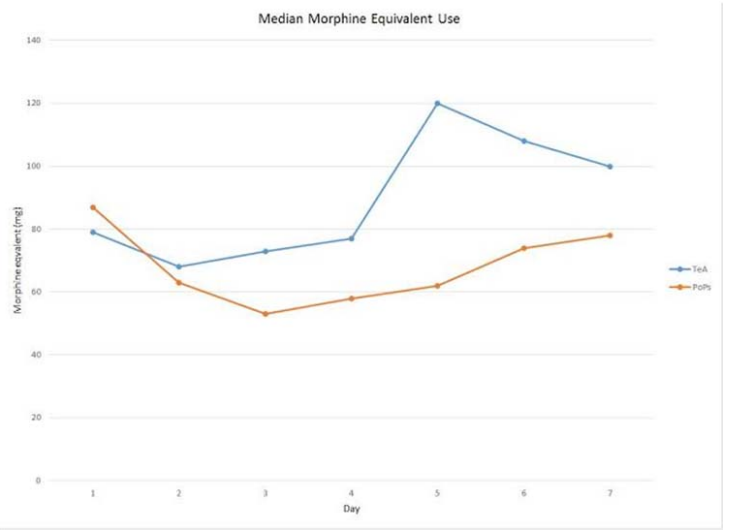

Figure 2 shows the median amount of morphine equivalent adjuncts used by patients daily.

Notes

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Trauma-TBI and Thoracic
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NOVEL MODIFIED VERESS NEEDLE IS SUPERIOR TO ANGIOCATHETER FOR DECOMPRESSION OF TENSION PNEUMOTHORAX IN A YORKSHIRE SWINE MODEL

Laura Fluke, DO, Jamie Fitch, MD*, Ryan Restrepo,
Christopher Gamble, Travis M. Polk, MD, FACS*
Naval Medical Center Portsmouth, VA

Presenter: Laura Fluke, DO

Objectives: High failure rates have been reported for decompression of tension pneumothorax (tPTX) with angiocatheters (AC) and this remains a major cause of preventable death. Other devices, such as modified Veress needles (mVN), may be more effective. We recently tested a novel mVN with an integral one-way valve (mVN1) with contradictory results. Following pneumatic studies without the valve demonstrating better air flow, mVN1 was re-engineered. We then hypothesized that the new mVN (mVN2) would be at least as effective as AC.

Methods: Using a validated swine model, intrathoracic CO2 was instilled until tension physiology occurred (50% reduction in cardiac output). Decompression was performed with mVN2. Rescue was defined as 80% recovery of baseline systolic blood pressure (SBP) within 5 minutes. Crossover with AC was performed if rescue failed. After recovery, pulseless electrical activity (PEA) was induced and maintained for 30 seconds before decompression. Rescue was defined as return of arterial wave form and mean arterial pressure (MAP) >20mmHg. Success, time to rescue, and vital signs were recorded. Results were compared to AC and mVN1 data from our recent randomized study.

Results: In total, 54 tPTX and 17 PEA events were conducted in 9 Yorkshire swine. Times to rescue from tPTX for mVN1, AC, and mVN2 were 146+/-94 sec, 86+/-84 sec, and 82 +/- 62 sec, respectively. Decompression with mVN2 resulted in higher post-decompression MAP and SBP compared to both mVN1 or AC (Fig 1). For both tPTX and PEA, mVN2 had 100% success at rescue; while the failure rates for AC and mVN1 were notably higher, particularly with PEA (Fig 2).

Conclusions: mVN2 may be an alternative to AC for tPTX with improved hemodynamic recovery and superior rescue from PEA. Experience with the valve on the mVN1 suggests that limitations to airflow during decompression is likely detrimental and should be avoided.

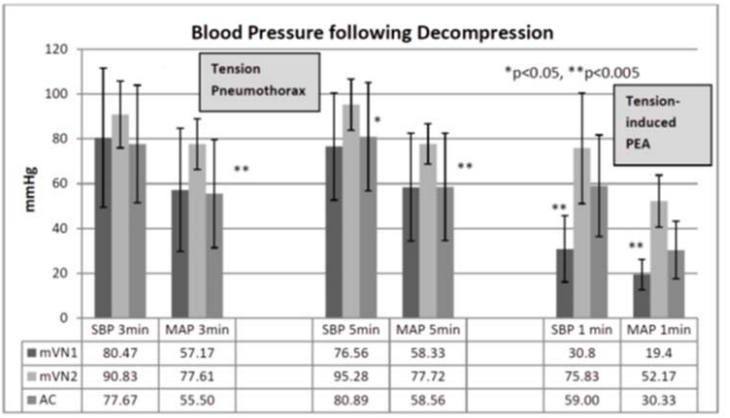

Figure 1. Mean arterial and systolic blood pressures at 3 and 5 min post decompression of tPTX and 1 min post-decompression of PEA.

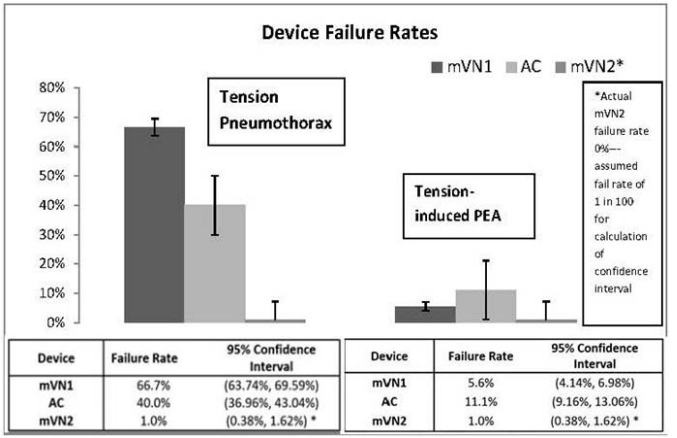

Figure 2. Failure Rates for rescue from tPTX and PEA.

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USE OF HIGH FLOW NASAL CANNULA IN ADULT TRAUMA PATIENTS

Meghan Halub, MD, Sheryl Sahr, MD, MS, FACS*, Kristina Gaunt,
Julie Jackson, Keith Lamb, Trevor Oetting
Iowa Methodist Medical Center

Presenter: Meghan Halub, MD

Objectives: High flow nasal cannula (HFNC) is a method of delivering non-invasive respiratory support which provides up to 100% FIO2 and may provide positive expiratory pressure. It is known to decrease mechanical ventilation (MV), reduce incidence of complications, and decrease hospital and ICU days. There are no data, however, regarding use of HFNC in trauma populations. The goal of this analysis is to determine the utility of HFNC for trauma patients admitted to the ICU.

Methods: The retrospective study examined trauma patients admitted to the ICU at a tertiary hospital between April 2013 and December 2014. HFNC was delivered by the Fischer & Paykel Optiflow system, with initial settings at 50 LPM and 50% FIO2. Categorical data are reported as counts and percentages, while continuous data are reported as medians with interquartile ranges (IQR). Correlations between variables were calculated with Spearman rho coefficient. All statistical tests were two-tailed and based on a 0.05 significance level. The study was approved by the IRB.

Results: Ninety-five trauma patients were admitted to the ICU, with 17 receiving MV prior to HFNC and 78 receiving no MV prior to HFNC. The most common injuries were rib fractures (69%), vertebral fractures (40%), and lung injuries (32%). More than 50% were former or current smokers. On average, HFNC was started one day after injury and had a median duration of 1 day and 11 hours (IQR: 0:19:43, 3:00:09). Two-thirds of patients who received HFNC never received MV and 95% of patients were discharged alive. The intubation rate after HFNC was 20%, which is comparable to similar studies in other patient populations. There was a moderate relationship between delay to first HFNC and hospital days (r_s=.42, $p<.001$).

Conclusions: Study results provide preliminary evidence that HFNC is safe and beneficial in a trauma ICU population. HFNC may be a reasonable method to improve pulmonary hygiene and potentially prevent intubation.

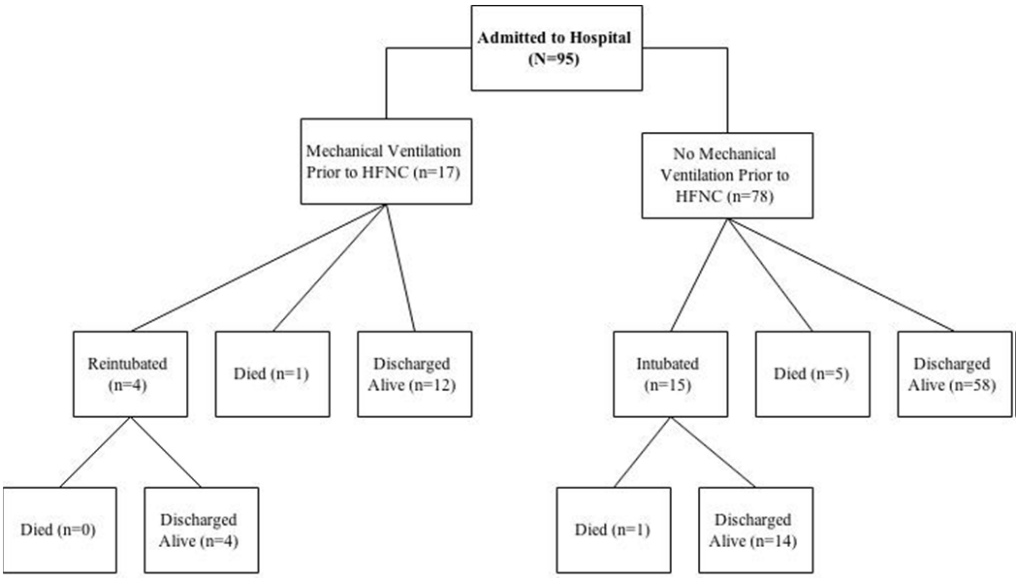

Figure 1. Trauma patients receiving high-flow nasal cannula (HFNC) therapy during hospitalization

Table 1. Diagnoses, comorbidities, and complications (N=95)

	All Trauma Patients
Injuries	
Rib Fracture(s)	65 (68.4%)
Vertebral Fracture	38 (40.0%)
Lung Injury/Contusion	30 (31.6%)
Upper Limb Fracture	27 (28.4%)
Intracranial Hemorrhage	26 (27.4%)
Pneumothorax/Hemothorax	23 (24.2%)
Internal Organ Injury (other than lung)	20 (21.1%)
Pelvic Fracture	13 (13.7%)
Lower Limb Fracture	11 (11.6%)
Skull Fracture	10 (10.5%)
Comorbidities	
Current or former smoker, n (%)	48 (50.5%)
Atrial fibrillation, n (%)	12 (12.6%)
COPD, n (%)	11 (11.6%)
Obstructive sleep apnea, n (%)	9 (9.5%)
Asthma, n (%)	6 (6.3%)
Complications	
Unplanned ICU admission, n (%)	26 (27.4%)
Medical emergency team call on floor, n (%)	11 (11.6%)

Table 1. Diagnoses, comorbidities, and complications (N=95)

Notes

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RIB FRACTURE FIXATION IN THE ≥65 YEAR OLD POPULATION: A PARADIGM SHIFT IN MANAGEMENT STRATEGY

Michael T. Fitzgerald, MD, Dennis W. Ashley, MD*,
D. Benjamin Christie, III, MD*, Hesham F. Abukhdeir
Mercer University at Medical Center of Central Georgia

Presenter: Michael T. Fitzgerald, MD

Objectives: With the advent of plating systems for chest wall stabilization, the practice paradigm for rib fracture management is shifting. We hypothesize that patients ≥65 years old who receive rib plating have decreased mortality and complication rates compared to controls and an accelerated return to functionality.

Methods: A retrospective review of patients(pts)≥65 years admitted from 2009-2015 receiving rib plating (RP) were compared to a randomly selected, non-operative, injury-matched control group (NO) admitted from 2003-2008. Pts were followed prospectively for quality of life. Data was pulled from our trauma registry and pt surveys. Variables studied were ISS, mortalities, hospital/ICU stay days, pneumonias (PNA), respiratory complications, readmissions, and length of rehab time. Group comparisons were made using chi-square or Fishers exact test. Normally distributed variables were compared by Student t-test; non-normally distributed data were compared by Wilcoxon rank sum test.

Results: NO pts (n=50) with age ranges of 65-97, average ISS of 18(14-22) vs age ranges of 63-89, average ISS of 21(15-25) for the RP group (n=23). Average total hospital stay days were 17(10-23) and 18(13-23) for the NO and RP groups respectively. Average ICU stay days were 12(6-16) and 8(5-11) for the NO and RP groups, respectively. 4 readmissions, 2 deaths, 7 PNAs, 7 pleural effusions and 19 recurrent pneumothoraces were noted in the NO group vs 0 in the RP group, $p<0.001$. Average rehab time was 10 days less in the RP group. Pt surveys favored the RP group.

Conclusions: The alarming historical mortality and pneumonia risks for pts ≥65 years with rib fractures are well established. Rib plating in trauma pts ≥65 years demonstrates a measurable decrease in mortality and respiratory complication rates, improves respiratory mechanics and overall clinical outcomes, therefore permitting a more accelerated return to functional lifestyles.

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