32nd EAST Annual Scientific Assembly

Program Book Linked Navigation

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32ND ANNUAL SCIENTIFIC ASSEMBLY

JANUARY 15-19, 2019

SCHEDULE OF EVENTS & MEETING INFORMATION

east

Eastern Association for the Surgery of Trauma

Advancing Science, Fostering Relationships, and Building Careers

JW MARRIOTT AUSTIN

AUSTIN, TEXAS

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 patient.** 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
7. Articulate methods to optimize outcomes and identify differences in management strategies for the geriatric patient population.

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 Eastern Association for the Surgery of Trauma (EAST). 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 29.75 *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 21.75 credits meet the requirements for Self-Assessment.

Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 0.50 hours meet the requirements for Pediatric Trauma. *

Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 3.5 hours meet the requirements for Trauma. *

Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 0.25 hours meet the requirements for Pain Management. *

Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 0.50 hours meet the requirements for Surgical Critical Care. *

Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 1.25 hours meet the requirements for Patient Safety. *

**The content of this activity may meet certain mandates of regulatory bodies. Please note that 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.*

Disclosure Information

In accordance with the ACCME Accreditation Criteria, the American College of Surgeons must ensure that anyone in a position to control the content of the educational activity (planners and speakers/authors) has disclosed all relevant financial relationships with any commercial interest. For additional information, please visit the ACCME website: http://www.accme.org/requirements/accreditation-requirements-cme-providers/policies-and-definitions/financial-relationships-and-conflicts-interest

The ACCME also requires that ACS manage any reported conflict and eliminate the potential for bias during the session. Any conflicts noted below have been managed to our satisfaction. The disclosure information is intended to identify any commercial relationships and allow learners to form their own judgments. However, if you perceive a bias during a session, please report it on the evaluation.

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure		
		Company	Role	Received
Adam Ackerman	X			
Vaidehi Agrawal	X			
Hasan Alam	X			
Ram Anantha	X			
Darwin Ang	X			
Nadja Apelt	X			
Michael Arnold	X			
Tess Aulet	X			
Martin Avery	X			
Jessica Ballou	X			
Gerard Baltazar	X			
Zachary Bauman	X			
Jessica Beard	X			
Andrew Bernard	X			
Mark Bernstein	X			
Stephanie Bonne	X			
Daniel Bonville	X			
Eric Bradburn	X			
Scott Brakenridge	X			
Susan Briggs	X			
Joshua Brown	X			
Brandon Bruns	X			
Keely Buesing		Respirogen	Scientific Advisory Board	Stock Owner
Nikolay Bugaev	X			
Alex Bulanov	X			
Eileen Bulger	X			
Randall Burd	X			
Patricia Byers	X			
Rachael Callcut	X			
Heather Carmichael	X			
Bryan Carr	X			
Damien Carter	X			
William Chiu	X			

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure		
		Company	Role	Received
Jae Choi	X			
A. Britton Christmas	X			
Jeffrey Claridge	X			
Jamie Coleman	X			
Kennith Coleman	X			
John Como	X			
Michael Cripps	X			
Bruce Crookes	X			
Daniel Cucher	X			
Vijaya Daniel	X			
Kimberly Davis	X			
Marc de Moya	X			
Patrick Delaplain	X			
Brad Dennis	X			
Christopher Dente		Surgical Critical Care Initiative - Collaborative of USUHS, Walter Reed Army Medical Center, Emory/Grady, Duke University with funding coming from the Henry Jackson foundation for the Advancement of Military Medicine	PI	Research Funding
Michael DeWane	X			
Adrian Diaz	X			
Jose Diaz	X			
Sandra DiBrito	X			
Linda Ding	X			
Sharmila Dissanaike	X			
Woo Do	X			
Jennings Dooley	X			
Joseph DuBose	X			
Juan Duchesne	X			
Thomas Duncan	X			
Ann Dyke	X			
Alexander Eastman	X			
Matthew Eckert	X			
Mathew Edavettal	X			
Peter Ehrlich	X			
Adel Elkbuli	X			
Sean Elwell	X			
Paula Ferrada	X			

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure		
		Company	Role	Received
Angela Fiege	X			
Brian Fletcher	X			
Dominic Forte	X			
John Fortune	X			
Shannon Foster	X			
Charles Fredericks	X			
Jessica Friedman	X			
Nina Glass	X			
Amy Goldberg	X			
Daniel Grabo	X			
Michaela Graham	X			
Justin Green	X			
Shea Gregg		Fall Call Solutions	President	Owner
Ronald Gross	X			
Oscar Guillamondegui	X			
Adil Haider	X			
Krista Haines	X			
Mohammad Hamidi	X			
Cara Hannigan	X			
Laura Harmon	X			
Jennifer Hartwell	X			
John Harvin	X			
Gabrielle Hatton	X			
Elliott Haut	X			
Juan Herrera-Escobar	X			
Vanessa Ho		Medtronic, Atricure	Spouse - Consultant	Spouse - Consultant Fee
Melissa Hockaday	X			
Katie Hokanson	X			
Daniel Holena	X			
Remealle How	X			
Patrick Isola	X			
Christina Jacovides	X			
Molly Jarman	X			
Laura Johnson	X			
Bellal Joseph	X			
D'Andrea Joseph	X			
Kimberly Joseph	X			
Hee Jung	X			
Haytham Kaafarani	X			
Danby Kang	X			
Susan Kartiko	X			
David Keeven	X			

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure		
		Company	Role	Received
David King	X			
Jordan Kirsch	X			
Jorie Klein	X			
Jennifer Knight Davis	X			
Lisa Kodadek	X			
Lisa Kodadek	X			
Lucy Kornblith	X			
John Kuckelman	X			
Deborah Kuhls	X			
Narong Kulvatunyou	X			
Stanley Kurek, Jr.	X			
Matthew Kutcher	X			
Matthew Lamb	X			
Brittany Le	X			
Christine Leeper	X			
Stefan Leichtle	X			
Matthew Lissauer	X			
David Livingston	X			
Nicole Lunardi	X			
Adam Maerz	X			
Debra Malone	X			
Jonathan Martin	X			
Kazuhide Matsushima	X			
Kenneth Mattox	X			
Kimball Maull	X			
Adrian Maung	X			
Michael Mazzei	X			
Abby McCall	X			
Robert McLoughlin	X			
Jonathan Messing	X			
David Meyer	X			
Elizabeth Miller	X			
Christopher Missler	X			
Alicia Mohr	X			
Frederick Moore	X			
Sarah Moore	X			
David Morris	X			
Douglas Morte	X			
Nathan Mowery	X			
Kaushik Mukherjee	X			
Jeffry Nahmias	X			
Mayur Narayan	X			

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure		
		Company	Role	Received
Timothy Nowack	X			
Juan Ochoa	X			
Emily Onufer	X			
Andrea Pakula		Bard Davol Intuitive Surgical	Speaker/ Procter	Honorarium
James Palmer	X			
Jose Pascual	X			
Mayur Patel	X			
Gregory Peck	X			
Andrew Peitzman	X			
Alvin Perry	X			
Joan Pirrung	X			
Laurie Punch	X			
Megan Quintana	X			
Farheen Qurashi	X			
Rishi Rattan	X			
Eugene Reilly	X			
Shelby Resnick	X			
Robyn Richmond	X			
Bryce Robinson	X			
Kortney Robinson	X			
Leigh Robinson	X			
Joseph Sakran	X			
Ayodele Sangosanya	X			
Ariel Santos	X			
Heena Santry		Johnson & Johnson	Fracture Fragility Advisory Council	Paid Consultant
Babak Sarani	X			
Dane Scantling	X			
Kevin Schuster	X			
Michael Scott	X			
Thomas Scott		Johnson & Johnson Pfizer Bayer	Stock Owner Stock Owner Consultant	Stock Owner Stock Owner Consultant Fees
Mark Seamon	X			
Elizabeth Seislove	X			
Jordan Shealy	X			
Michael Sise	X			
Jeffrey Skubic	X			
Jeffrey Skubick	X			
Weston Smedley	X			
Alison Smith	X			

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure		
		Company	Role	Received
Jason Smith	X			
Nicole Stassen	X			
Deborah Stein	X			
Lauren Steward	X			
Amy Stewart	X			
Ronald Stewart	X			
Benjamin Stocker	X			
Yujin Suto	X			
Ronald Tesoriero	X			
Glen Tinkoff	X			
S Todd	X			
Gail Tominaga	X			
Georgia Vasileiou	X			
Cory Vatsaas	X			
Michael Vella	X			
Tawnya Vernon	X			
Patrick Walker	X			
Rachel Warner	X			
William Weaver	X			
Brian Williams	X			
James Williams	X			
Alison Wilson	X			
Robert Winfield	X			
D. Dante Yeh		Shire Up-to-Date	Investigator Author	Research Grant Royalties
Michelle Yen	X			
Brian Yorkgitis	X			
Tanya Zakrison	X			
Planning Committee	**Nothing to Disclose**	**Disclosure**		
		Company	**Role**	**Received**
Rachael Callcut		ARES Trading Inc GE Healthcare Servier Inc Intel Haemonetics	PI PI PI PI PI	Research Grant to UCSF Research Grant to UCSF Research Grant to UCSF Research Grant to UCSF Research Grant
Jamie Coleman	X			
Shannon Foster	X			
Bellal Joseph	X			
Matthew Lissauer		La jolla Pharmaceutical	Speaker's Bureau for Angiotensin II as a pressor	Honorarium
Matthew Martin	X			

Planning Committee	Nothing to Disclose	Disclosure		
		Company	Role	Received
R. Shayn Martin	X			
Adrian Maung	X			
Alicia Mohr	X			
Carlos Rodriguez	X			
Joseph Sakran	X			
Mark Seamon	X			
Cynthia Talley	X			
Ronald Tesoriero	X			
Catherine Velopulos	X			

Commercial Support Acknowledgement

The Eastern Association for the Surgery of Trauma wishes to recognize and thank the following companies for their ongoing commercial support:

Envision Physician Services – Support of the No Suit, No Problem Networking Session

The Society of Trauma Nurses is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

The following is a list of possible contact hours for applicable sessions:

Session	Date/Time	CNE
APN Workshop		4.0 Hours
Short Course – The Insider's Guide to Kickstarting your Research Career*	Wednesday, January 16, 2019 8:00 am-11:45 am	3.75 Hours
Short Course – How to Strategically Design, Implement, & Expand an Injury Prevention Program*	Wednesday, January 16, 2019 8:00 am-11:45 am	3.75 Hours
Short Course – Developing a Trauma Quality & Safety Program*	Wednesday, January 16, 2019 8:00 am-11:45 am	3.75 Hours
Scientific Session I	Wednesday, January 16, 2019 12:30 pm-2:30 pm	2.0 Hours
Scientific Session II	Wednesday, January 16, 2019 2:45 pm-4:25 pm	1.65 Hours
Parallel Plenary Sessions*	Thursday, January 17, 2019 9:00 am-10:00 am	1.0 Hour
Parallel Plenary Sessions*	Thursday, January 17, 2019 9:00 am-10:00 am	1.0 Hour
Scientific Session III-A*	Thursday, January 17, 2019 10:15 am-12:15 pm	2.0 Hours
Scientific Session III-B*	Thursday, January 17, 2019 10:15 am-12:15 pm	2.0 Hours
Parallel Plenary Session*	Thursday, January 17, 2019 1:30 pm-2:30 pm	1.0 Hour
Parallel Plenary Session*	Thursday, January 17, 2019 1:30 pm-2:30 pm	1.0 Hour
Quick Shots I*	Thursday, January 17, 2019 2:30 pm-3:30 pm	1.0 Hour
Quick Shots II*	Thursday, January 17, 2019 2:30 pm-3:30 pm	1.0 Hour
Parallel Plenary Session*	Thursday, January 17, 2019 3:45 pm-5:00 pm	1.25 Hours
Parallel Plenary Session*	Thursday, January 17, 2019 3:45 pm-5:00 pm	1.25 Hours
Quick Shots III*	Thursday, January 17, 2019 5:00 pm-6:15 pm	1.25 Hours
Quick Shots IV*	Thursday, January 17, 2019 5:00 pm-6:15 pm	1.25 Hours
Parallel Plenary Session*	Friday, January 18, 2019 7:45 am-8:45 am	1.0 Hour
Quick Shot V*	Friday, January 18, 2019 7:45 am-8:45 am	1.0 Hour
Scott B. Frame, MD Memorial Lecture	Friday, January 18, 2019 8:45 am-9:45 am	1.0 Hour
Scientific Session IV-A*	Friday, January 18, 2019 10:00 am-12:00 pm	2.0 Hours
Scientific Session IV-B*	Friday, January 18, 2019 10:00 am-12:00 pm	2.0 Hours
Plenary – Practice Management Guidelines	Friday, January 18, 2019 1:15 pm-3:15 pm	2.0 Hours

* These are parallel sessions. You may only claim credit for one session in each time slot.

To claim CNE please complete the evaluations online at http://www.traumanurses.org/east-cne-evaluation-forms
Certificates will be distributed via email. Evaluations must be completed to receive CNE.

Visit the STN Booth in the EAST Exhibit Hall for additional details, or contact Brian Doty, STN Meetings and Education Director, at 859-977-7446 or bdoty@traumanurses.org for more information.

On behalf of the Board of Directors, Executive Director Christine Eme, the EAST Administrative Staff, and the EAST Committee Chairs, it's my pleasure to welcome you to the 32nd Annual Scientific Assembly of the Eastern Association for the Surgery of Trauma (EAST). In the spirit of a triennial 'EAST Goes West', we've gathered at the beautiful new JW Marriott Austin in the heart of Austin's lively downtown.

Matt Martin and the Annual Scientific Assembly Committee have again prepared an exciting program that has all of your EAST favorites plus some innovative twists. The Injury Control and Violence Prevention Committee and volunteers again arrived early on Tuesday, January 15, 2019 for the Injury Prevention Outreach Program, now in its 7th year. The Pre-meeting Leadership Development and Fellow/Resident Workshops remained popular. Pre-courses that were previously offered for a fee are now Short Courses and are included as part of the primary scientific meeting registration to add more value to your meeting. The Short Courses offer in-depth content on boosting your research program, building an injury prevention program, and optimizing surgical and trauma quality.

Social programming and special sessions will punctuate cutting edge scientific sessions. The Raymond Alexander and Cox-Templeton Paper Competitions allow us to recognize exceptional work by residents and fellows and in the area of injury prevention respectively. Powerful plenaries on equity and burnout and suicide will round out afternoons that include challenging cases posed to our Master Surgeon Panel, a session on strategies to avoid opiates, all new EAST Practice Management Guidelines, and a video session rich with technical tips and tricks on a variety of topics in acute care surgery. The Society of Trauma Nurses will also walk you through the new TQIP Imaging Guidelines.

Dr. Andy Peitzman will discuss the life of a surgeon in the Oriens Keynote Address on Thursday morning before we hear the Oriens Essayists share why they aspire to a career in trauma surgery. Dr. Juan Ochoa will deliver the Scott B. Frame, MD Memorial Lecture on Friday morning, reflecting on experience in scientific study of surgical nutrition and sharing strategies for funding tomorrow's clinical studies.

We've had a very productive year in EAST thanks to all of you and the leadership of our committee and division chairs. Members are strongly encouraged to attend the business meeting where you'll hear exciting updates on membership, committee work and organizational finances.

The social program is packed, starting with Wednesday's Opening Reception. On Thursday morning, come network at the 'No Suit, No Problem' session. There are receptions on Thursday for everyone who donated to the Development Fund this year (there's still time to get an invitation!) and a reception with our STN partners. On Friday, dodgeball is back with all the proceeds benefiting the Development Fund. We tailgate Friday afternoon. I'm sure Austin's music scene will find many an EAST member and guest two-stepping into Friday night as we've left the evening open for you to enjoy this wonderful host city.

It has been my greatest honor serving as your President. Your friendship, collaboration and commitment to our patients inspire me and make EAST so special. I look forward to seeing you during the meeting. Again, welcome to Austin!

Andrew C. Bernard, MD, 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

2018 Board of Directors

Andrew C. Bernard, MD, FACS, President
Elliott R. Haut, MD, PhD, FACS, President-Elect
Bruce A. Crookes, MD, FACS, Past President
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Mayur B. Patel, MD, MPH, FACS, Director
Mark J. Seamon, MD, FACS, Director
Jason W. Smith, MD, PhD, FACS, Director
Alison M. Wilson, MD, FACS, Director

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

Oscar D. Guillamondegui, MD, MPH, FACS

2018 Divisions, Committee & Ad Hoc Task Forces

Development Committee
Babak Sarani, MD, FACS, Committee Chair
Alexander L. Eastman, MD, MPH, FACS, Vice Chair

Division of Education
Matthew J. Martin, MD, FACS, Division Chair
Annual Scientific Assembly Committee – Matthew J. Martin, MD, FACS, Committee Chair
Online Education Committee – David S. Morris, MD, FACS, Committee Chair

Division of Member Services
Jeffrey A. Claridge, MD, MS, FACS, Division Chair
Member Recruitment and Retention Committee – Jeffrey A. Claridge, MD, MS, FACS, Committee Chair

Division of Patient Care and Resources
Mayur B. Patel, MD, MPH, FACS, Division Chair
Emergency General Surgery Committee – D. Dante Yeh, MD, FACS, Committee Chair
Guidelines Committee – John J. Como, MD, MPH, FACS, Committee Chair
Injury Control & Violence Prevention Committee – Joseph V. Sakran, MD, MPH, MPA, FACS, Committee Chair
Quality, Safety, & Outcomes Committee – Jose Pascual Lopez, MD, PhD, FACS, Committee Chair

Division of Professional Development
Alison M. Wilson, MD, FACS, Division Chair
Career Development Committee – Brad Dennis, MD, FACS, Committee Chair
Mentoring Committee – Paula Ferrada, MD, FACS, Committee Chair
Military Committee – Daniel J. Bonville, DO, FACS & Daniel J. Grabo, MD, FACS, Committee Chairs
Seniors Committee – William C. Chiu, MD, FACS, Committee Chair

Division of Publications
Mark J. Seamon, MD, FACS, Division Chair
Manuscript & Literature Review Committee – Mark J. Seamon, MD, FACS, Committee Chair

Division of Research
Jason W. Smith, MD, PhD, FACS, Division Chair
Multicenter Trials Committee – Jeffry Nahmias, MD, MHPE, FACS, Committee Chair
Research-Scholarship Committee – Robert D. Winfield, MD, FACS, Committee Chair

Equity, Quality, & Inclusion in Trauma Surgery Practice Ad Hoc Task Force
Tanya L. Zakrison, MD, MPH, FACS, Ad Hoc Task Force Chair
Brian H. Williams, MD, FACS, Ad Hoc Task Force Co-Chair

Visit “About EAST” on the EAST website, www.east.org,
for listings of EAST Committees.

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*
2015	Stanley J. Kurek	*Resilience*
2016	Nicole A. Stassen	*Pay it Forward*
2017	Bruce A. Crookes	*It is a Sin to be Good When You Were Sent to be Great: Quality in Trauma Care*

FOUNDING MEMBERS

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

*Deceased

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
Carl Boyd	Recorder/Program Chair
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

1993

Michael Rhodes	President
Carl Boyd	President Elect
C. William Schwab	Past President
William F. Fallon, Jr.	Secretary/Treasurer
John A. Morris, Jr.	Recorder/Program Chair
Christopher Born	Director at Large
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

1994

Carl Boyd	President
James Hassett	President Elect
Michael Rhodes	Past President
William F. Fallon, Jr.	Secretary/Treasurer
John A. Morris, Jr.	Recorder/Program Chair
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Sylvia Campbell	Director at Large
Thomas Cogbill	Director at Large
Paul Cunningham	Director at Large
Brad Cushing	Director at Large
James Hurst	Director at Large
J. Wayne Meredith	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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James Hassett	President
William F. Fallon, Jr.	President Elect
Carl Boyd	Past President
David Reath	Secretary/Treasurer
John A. Morris, Jr.	Recorder/Program Chair
Thomas Cogbill	Director at Large
Brad Cushing	Director at Large
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
Steven R. Shackford	Director at Large

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William F. Fallon, Jr.	President
John A. Morris, Jr.	President Elect
James Hassett	Past President
David Reath	Secretary/Treasurer
Paul Cunningham	Recorder/Program Chair
Philip S. Barie	Director at Large
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

1997

John A. Morris, Jr.	President
Timothy C. Fabian	President Elect
William F. Fallon, Jr.	Past President
David Reath	Secretary/Treasurer
Paul Cunningham	Recorder/Program Chair
Nabil Atweh	Director at Large
Philip S. Barie	Director at Large
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
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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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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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Eric Frykberg*	President Elect
David Reath	Past President
Blaine Enderson	Secretary/Treasurer
Michael F. Rotondo	Recorder/Program Chair
Jack Bergstein	Director at Large
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
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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

2015

Stanley Kurek, Jr.	President
Nicole Stassen	President-Elect
Kimberly Davis	Past President
Bruce Crookes	Treasurer
Elliott Haut	Secretary
Andrew Bernard	Recorder
Joseph DuBose	Director at Large
Samir Fakhry	Director at Large
Oscar Guillamondegui	Director at Large
Babak Sarani	Director at Large
Kevin Schuster	Director at Large
Deborah Stein	Director at Large

2016

Nicole Stassen	President
Bruce Crookes	President-Elect
Stanley Kurek, Jr.	Past President
A. Britton Christmas	Treasurer
Elliott Haut	Secretary
Andrew Bernard	Recorder
William Chiu	Director at Large
Jeffrey Claridge	Director at Large
Babak Sarani	Director at Large
Kevin Schuster	Director at Large
Jason Smith	Director at Large
Deborah Stein	Director at Large

2017

Bruce Crookes	President
Andrew Bernard	President-Elect
Nicole Stassen	Past President
A. Britton Christmas	Treasurer
Elliott Haut	Secretary
William Chiu	Director at Large
Jeffrey Claridge	Director at Large
Matthew Martin	Director at Large
Mayur Patel	Director at Large
Mark Seamon	Director at Large
Jason Smith	Director at Large
Deborah Stein	Director at Large

PAST MEETINGS

January 13-16, 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
January 12-16, 2016	*JW Marriott San Antonio*	San Antonio, TX
January 10-14, 2017	*The Diplomat Beach Resort*	Hollywood, FL
January 9-13, 2018	*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 Tactical 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

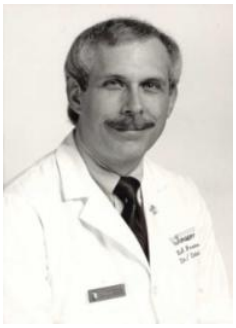
I was asked by President Rotondo to make a brief presentation of a significance which will become apparent shortly. Yesterday, I was surprised to discover that 5% of Active EAST members have been deployed to war in Iraq/Afghanistan in the past year alone. But, let me share with you a story of a 22 y.o. Lance Corporal in the USMC who was injured in 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. Lance Corporal Paul Bartolome (pictured below) who made this presentation himself at the 25th EAST Annual Scientific Assembly on January 13, 2012 at Disney's Contemporary Resort in Lake Buena Vista, Florida.

Lance Corporal Paul Bartlome addressing the audience (L) and receiving the tourniquet that was used to save his life as described above (R) from the 25th EAST President Erik S. Barquist, MD, FACS



Scott B. Frame, MD Memorial Lecture

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
2017 Michael F. Rotondo, MD, FACS
2018 Steven R. Shackford, MD, FACS
2019 Juan B. Ochoa, MD, FACS

The Raymond H. Alexander MD Resident Paper Competition

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 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 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, EAST is 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 is able to award on an annual basis, the John M. Templeton, Jr., MD Injury Prevention Research Scholarship, 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 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, the Cox-Templeton Injury Prevention Paper Competition, and the John M. Templeton, Jr., MD Military Call to Service Scholarship.

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)
2016 COL Brian J. Eastridge, MD, FACS
2017 COL Kirby R. Gross, MD, FACS
2018 Raymond Fang, MD, FACS Colonel (ret), USAF, MC, FS

Eastern Association for the Surgery of Trauma (EAST)
32nd Annual Scientific Assembly
OVERALL SCHEDULE

TUESDAY, JANUARY 15, 2019

7:30 am-6:00 pm	Registration	**JW Grand South Foyer**
7:30 am-6:00 pm	Speaker Preparation Room	**407**
7:30 am-4:00 pm	EAST Information Table *Stop by for membership information or to make a contribution to the EAST Development Fund!*	**JW Grand South Foyer**
7:00 am-5:00 pm	EAST Community Outreach 2019 *Buses depart JW Marriott at 7:15 am*	**Westlake High School Austin, Texas**

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 Committee*	**408-409**
12:30 pm-4:30 pm	Pre-Scientific Assembly Guidelines Committee Meeting (30 ppl.)	**212**
6:00 pm-9:00 pm	Exhibit Set-up	**JW Grand Ballrooms 1-4**

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

1:30 pm-5:00 pm	**Bridging the Gap: A Chief Residents and Fellows Workshop** *Presented by the EAST Career Development Committee*	**402-403**
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	**502-503**

Industry Events

6:00 pm-8:00 pm	EAST Think Group hosted by ACell	**405 (Boardroom)**
6:00 pm-8:00 pm	EAST Think Group hosted by Surgical Theater, LLC	**211**
6:00 pm-9:00 pm	Portola Pharmaceuticals Industry Education Symposium	**209 & 210**

WEDNESDAY, JANUARY 16, 2019

7:00 am-11:00 am	Manuscript and Literature Review Committee Meeting (30 ppl.)	**201-202**

Short Courses - Space is limited, pre-registration required.

8:00 am-11:45 am	**EAST Short Course #1 The Insider's Guide to Kickstarting Your Research Career: What No One Ever Tells You About Becoming a Surgeon-Scientist** *Presented by the EAST Research-Scholarship Committee*	**502-503**
8:00 am-11:45 am	**EAST Short Course #2 How to Strategically Design, Implement, & Expand an Injury Prevention Program** *Presented by the EAST Injury Control & Violence Prevention Committee*	**408-409**
8:00 am-11:45 am	**EAST Short Course #3 Developing a Trauma Quality & Safety Program** *Presented by the EAST Quality, Safety, & Outcomes Committee*	**402-403**
6:30 am-5:45 pm	Registration	**JW Grand South Foyer**
6:30 am-5:45 pm	Speaker Preparation Room	**407**
7:00 am-11:00 am	Exhibit Set-up	**JW Grand Ballrooms 1-4**
12:00 pm-4:30 pm	EAST Information Table *Stop by for membership information or to contribute to the EAST Development Fund!*	**JW Grand South Foyer**
12:00 pm-4:45 pm	Exhibits	**JW Grand Ballrooms 1-4**
12:00 pm-12:30 pm	**Opening Ceremony - Flag Ceremony and Opening Remarks**	**JW Grand Ballrooms 6-8**

WEDNESDAY, JANUARY 16, 2019 (CONTINUED)

12:30 pm-2:30 pm	**Scientific Session I: Raymond H. Alexander, MD Resident Paper Competition** *(Papers 1-6)* Moderators: Andrew C. Bernard, MD & Rachel L. Warner, DO *(2018 Clinical Science Paper Recipient)*	**JW Grand Ballrooms 6-8**
2:30 pm-2:45 pm	Afternoon Break - Visit the exhibit hall!	**JW Grand Ballrooms 1-4**
2:45 pm-4:25 pm	**Scientific Session II: Raymond H. Alexander, MD Resident Paper Competition** *(Papers 7-11)* Moderators: Elliott R. Haut, MD, PhD & John P. Kuckelman, DO *(2018 Basic Science Paper Recipient)*	**JW Grand Ballrooms 6-8**
4:30 pm-5:30 pm	**Opening Keynote - Presidential Address** ***EAST: A Legacy of Inclusion*** **Andrew C. Bernard, MD, FACS**	**JW Grand Ballrooms 6-8**
5:40 pm-6:40 pm	**EAST Annual Business Meeting - Open to All EAST Members**	**JW Grand Ballrooms 6-8**
8:00 pm-10:00 pm	HCA Pop-up Meeting	**405 (Boardroom)**

EAST Receptions & Special Events

6:45 pm-7:45 pm	EAST Development Donor & Exhibitor Appreciation Reception *(By invitation only)*	**502-503**
6:45 pm-8:45 pm	Opening Reception - Ticketed Event *(RSVP Requested)*	**Griffin Hall**
8:30 pm-10:00 pm	President's Private Reception *(By invitation only)*	**Corner Restaurant** **City Limits Dining Room**

THURSDAY, JANUARY 17, 2019

6:30 am-5:00 pm	Registration	**JW Grand South Foyer**
6:30 am-5:00 pm	Speaker Preparation Room	**407**
7:00 am-5:00 pm	EAST Information Table *Stop by for membership information or to contribute to the EAST Development Fund!*	**JW Grand South Foyer**
7:00 am-8:10 am	**No Suit, No Problem: Fostering Relationships & Building Careers** Networking & Attendee Continental Breakfast *Presented by the EAST Career Development Committee* *Supported by an unrestricted grant from Envision Physician Services*	**JW Grand Ballroom 5**
7:45 am-4:00 pm	Exhibits	**JW Grand Ballrooms 1-4**
8:00 am-9:15 am	Continental Breakfast provided in the Exhibit Hall	**JW Grand Ballrooms 1-4**
8:15 am-9:00 am	**EAST Annual Oriens Presentations** *Presented by the EAST Career Development Committee* *Supported by an unrestricted grant from the Polk Family Charitable Foundation* 8:20 am-8:50 am Keynote Address – *The Yin and Yang of Life as a Surgeon* Speaker: Andrew B. Peitzman, MD, FACS 8:50 am-9:00 am - 2019 EAST Oriens Essay Presentations Resident Winner – Danby Kang, MD Fellow Winner – Lisa M. Kodadek, MD	**JW Grand Ballrooms 6-8**
9:00 am-10:00 am	**Parallel Plenary Session** Engage the Masters Expert Panel Session *Presented by the EAST Career Development Committee* *Moderators: Eric Bradburn, DO, Stefan Leichtle, MD, Gregory Peck, DO & Ayodele Sangosanya, MD*	**JW Grand Ballrooms 6-8**
9:00 am-10:00 am	**Parallel Plenary Session** From Burnout to Suicide: How Do We Protect Ourselves & Each Other? *Presented by the EAST Mentoring Committee* Moderator: Thomas Duncan, DO	**JW Grand Ballroom 5**
10:00 am-10:15 am	Morning Break - Refreshments provided in the Exhibit Hall	**JW Grand Ballrooms 1-4**

THURSDAY, JANUARY 17, 2019 (CONTINUED)

10:15 am-12:15 pm	**Scientific Session III-A: Clinical Trauma & Resuscitation** *(Papers 12-17)* Moderators: A. Britton Christmas, MD & Bruce Crookes, MD	**JW Grand Ballrooms 6-8**
10:15 am-12:15 pm	**Scientific Session III-B: Cox-Templeton Injury Prevention Paper Competition** *(Papers 18-23)* Moderators: Joseph V. Sakran, MD, MPH, MPA & Tanya L. Zakrison, MD. MPH *(2018 Recipient)*	**JW Grand Ballroom 5**
12:15 pm-1:30 pm	Past Presidents Luncheon *(By invitation only)*	**Brazos Room**
12:15 pm-1:30 pm	Lunch on your own	
12:30 pm-1:30 pm	**EAST Committee & Task Force Meetings**	
	Career Development Committee (17 ppl.)	**502**
	Development Committee (11 ppl.)	**405 (Boardroom)**
	Equity, Quality, & Inclusion in Trauma Surgery Practice Ad Hoc Task Force (24 ppl.)	**403**
	Guidelines Committee (31 ppl.)	**409**
	Injury Control & Violence Prevention Committee (26 ppl.)	**408**
	Member Recruitment & Retention Committee (16 ppl.)	**504**
	Military Committee (20 ppl.)	**503**
	Online Education Committee (21 ppl.)	**402**
	Multicenter Trials Committee (17 ppl.)	**406**
	Seniors Committee (15 ppl.)	**505**
1:30 pm-2:30 pm	**Parallel Plenary Session** EAST Master Class Surgical Video Session *Presented by the EAST Annual Scientific Assembly Committee* Moderators: Matthew Lissauer, MD & Adrian Maung, MD	**JW Grand Ballrooms 6-8**
1:30 pm-2:30 pm	**Parallel Plenary Session** Scientific Papers That Should Have Change Your Practice *Presented by the EAST Manuscript and Literature Review Committee* Moderator: Damien Carter, MD	**JW Grand Ballroom 5**
2:30 pm-3:30 pm	**Quick Shots Parallel Session I** *(Quick Shots 1-10 Presented)* Moderators: William Chiu, MD & Jeffrey Claridge, MD, MS	**JW Grand Ballrooms 6-8**
2:30 pm-3:30 pm	**Quick Shots Parallel Session II** *(Quick Shots 11-20 Presented)* Moderators: Jason Smith, MD, PhD & Alison Wilson, MD	**JW Grand Ballroom 5**
3:30 pm-3:45 pm	Afternoon Break - Visit the exhibit hall!	**JW Grand Ballrooms 1-4**
3:45 pm-5:00 pm	**EAST Presidential Plenary Session** #EAST4ALL: An Introduction to the EAST Equity, Quality, & Inclusion in Trauma Surgery Practice Ad Hoc Task Force *Presented by the EAST Equity, Quality, & Inclusion in Trauma Surgery Practice Ad Hoc Task Force* Moderators: Tanya Zakrison, MD, MPH & Brian Williams, MD	**JW Grand Ballrooms 6-8**
3:45 pm-5:00 pm	**Parallel Plenary Session** Integration of a Best Practice Radiology Guideline in the Trauma Population *Presented by the Society of Trauma Nurses (STN)* Moderator: Joan Pirrung, MSN, APRN, ACNS-BC	**JW Grand Ballroom 5**

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

1:30 pm-5:45 pm	**Advanced Practitioners in Trauma Workshop** Addressing Professional and Clinical Development When Caring for the Acutely Injured Patient *Presented by EAST and Society of Trauma Nurses (STN)*	**201-202**
5:00 pm-6:15 pm	**Quick Shots Parallel Session III** *(Quick Shots 21-32 Presented)* Moderators: Daniel Bonville, DO & Robert Winfield, MD	**JW Grand Ballrooms 6-8**

THURSDAY, JANUARY 17, 2019 (CONTINUED)

5:00 pm-6:15 pm	**Quick Shots Parallel Session IV** *(Quick Shots 33-44 Presented)* Moderators: Brad Dennis, MD & Paula Ferrada, MD	**JW Grand Ballroom 5**

EAST Receptions & Special Events

6:00 pm-8:00 pm	Society of Trauma Nurses (STN) Networking Reception *(By invitation only)*	**Brazos Foyer & Room**
6:30 pm-9:30 pm	EAST President's Reception & Dinner *(By invitation only)*	**Osteria Pronto Restaurant**

Industry Events

6:15 pm-8:15 pm	DePuy Synthes Industry Education Symposium	**203 & 204**
6:15 pm-9:15 pm	Z-Medica Industry Education Symposium	**408 & 409**

FRIDAY, JANUARY 18, 2019

6:30 am-10:00 am	Registration	**JW Grand South Foyer**
6:30 am-1:00 pm	Speaker Preparation Room	**407**
7:00 am-12:00 pm	EAST Information Table *Stop by for membership information or to contribute to the EAST Development Fund!*	**JW Grand South Foyer**
6:30 am-10:00 am	Exhibits	**JW Grand Ballrooms 1-4**
6:45 am-8:15 am	Continental Breakfast provided in the Exhibit Hall	**JW Grand Ballrooms 1-4**
7:00 am-7:45 am	**EAST Awards Ceremony & Recognition & Gavel Exchange** *Open to all meeting attendees* • EAST Milestone Donors Recognition • EAST Mentor Recognition • EAST Executive Leadership Coaching and Mentoring Program Recognition • Raymond H. Alexander, MD Resident Paper Competition • Best Manuscript Award • EAST Oriens Award • Military Recognitions • John P. Pryor, MD Distinguished Service in Military Casualty Care Award • Military • John M. Templeton, Jr., MD Military Call to Service Scholarship • Cox-Templeton Injury Prevention Paper Award • 2019 John M. Templeton, Jr., MD Injury Prevention Research Scholarship • 2019 Trauma Research Scholarship • 2019 Multicenter Trials Junior Investigator Award • 2018 Health Policy and Management Scholarship Recipient • 2019 Society of Trauma Nurses/EAST Nurse Fellow Recipient • 2019 Leadership Development Workshop Scholarship Recognition	**JW Grand Ballrooms 6-8**
7:45 am-8:45 am	**Parallel Plenary Session** There are No Narcotics Left; Now What? Contemporary Options for Pain Management *Presented by the EAST Guidelines Committee* Moderator: Babak Sarani, MD	**JW Grand Ballrooms 6-8**
7:45 am-8:45 am	**Quick Shots Session V** *(Quick Shots 45-54 Presented)* Moderators: Daniel Grabo, MD & David Morris, MD	**JW Grand Ballroom 5**
8:45 am - 9:45 am	**Scott B. Frame, MD Memorial Lecture** ***The Business of Research: An Exploration Into the Experiences Gained from a Career in Academia & Industry*** **Juan B. Ochoa, MD, FACS, FCCM**	**JW Grand Ballrooms 6-8**
9:45 am-10:00 am	Morning Break - Last call in the Exhibit Hall!	**JW Grand Ballrooms 1-4**
10:00 am-2:00 pm	Exhibit Tear-down	**JW Grand Ballrooms 1-4**

FRIDAY, JANUARY 18, 2019 (CONTINUED)

10:00 am-12:00 pm **Scientific Session IV-A: Critical Care** **JW Grand Ballrooms 6-8**
(Papers 24-29)
Moderators: Jose Pascual, MD, PhD & Alexander Eastman, MD, MPH

10:00 am-12:00 pm **Scientific Session IV-B: Emergency General Surgery & Trauma Systems** **JW Grand Ballroom 5**
(Papers 30-35)
Moderators: Jeffry Nahmias, MD, MHPE & D. Dante Yeh, MD

12:00 pm-1:15 pm Lunch on your own

12:15 pm-1:15 pm **EAST Committee & Task Force Meetings**

EAST Exempt Purpose Task Force (8 ppl.)	**401**
Annual Scientific Assembly Committee (15 ppl.)	**405 (Boardroom)**
Emergency General Surgery Committee (28 ppl.)	**406**
Manuscript & Literature Review Committee (30 ppl.)	**409**
Mentoring Committee (14 ppl.)	**504**
Research-Scholarship Committee (11 ppl.)	**505**
Quality, Safety, & Outcomes Committee (17 ppl.)	**408**

1:15 pm-3:15 pm **Practice Management Guidelines (PMGs) Plenary Session** **JW Grand Ballroom 5**
Presented by the EAST Guidelines Committee
Moderators: John J. Como, MD, MPH and Deborah Stein, MD, MPH

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

Injury Prevention
- Orthogeriatrics Management- Kaushik Mukherjee, MD, MSCI
- Alcohol-Related Trauma Recidivism Prevention: Hospital-Based Screening in Adult Populations – Lisa Kodadek, MD
- Prevention of Firearm Related Injuries with Gun Buyback Programs & Community-Based Violence Prevention Programs – Stephanie Bonne, MD

Surgical Critical Care
- Diaphragmatic Pacing in Spinal Cord Injury Patients – Jennifer Knight Davis, MD
- Antimotility Agents in Diarrhea – Nikolay Bugaev, MD

Trauma
- Preperitoneal Packing for Pelvic Fracture Hemorrhage – Nikolay Bugaev, MD
- Management of Duodenal Trauma – Krista Haines, DO
- Presumptive Antibiotics for Tube Thoracostomy in Trauma – Cory Vatsaas, MD

1:15 pm-3:15 pm **You Have Entered the Twilight Zone:** **502-503**
Late Career & Retirement Success for Surgeons
Presented by the EAST Seniors Committee
Moderator: Ronald I. Gross, MD

EAST Receptions & Special Events

3:30 pm-6:30 pm Annual EAST Development Committee Fundraiser **Griffin Hall**
Dodgeball Tournament & Tailgate Party

SATURDAY, JANUARY 19, 2019

7:00 am-8:30 am EAST Board of Directors Meeting **502-503**
(By invitation only)

Eastern Association for the Surgery of Trauma (EAST)
32nd Annual Scientific Assembly
SCIENTIFIC SESSIONS

WEDNESDAY, JANUARY 16, 2019

8:00 am-11:45 am Short Courses – Pre-registration Required

The Insider's Guide to Kickstarting Your Research Career: What No One Ever Tells You About Becoming a Surgeon-Scientist
Presented by the EAST Research-Scholarship Committee
Location: Room 402-403, 4th Floor
Moderator: Robert D. Winfield, MD
Speakers:
Brandon Bruns, MD – Understanding local hiring practices
Rachael A. Callcut, MD, MSPH – What features does my ideal fit possess?
Michael W. Cripps, MD – What is my area of focus going to be?
Daniel N. Holena, MD, MSCE – Compensation/Rewards
Bellal Joseph, MD – Time and work commitment
David King, MD – Running an effective lab/team meetings
Jose L. Pascual, MD, PhD – What are my strengths and weaknesses?
Heena P. Santry, MD, MS – What do I need from a program to be successful & how do I negotiate it?
D. Dante Yeh, MD – Utilizing unpaid volunteers
Robert D. Winfield, MD – Handling difficult situations
Tanya L. Zakrison, MD, MPH – What am I trying to achieve?

How to Strategically Design, Implement, & Expand a Hospital-Based Injury Prevention Program
Presented by the EAST Injury Control & Violence Prevention Committee
Location: Room 408-409, 4th Floor
Moderator: Shea Gregg, MD
Speakers:
Ann Dyke, BHScN, MN, RN – How to increase the scale of geriatric injury prevention
Angela Fiege, MD – Rachael's first week: Turning tragedy into prevention by beginning a novel intervention program targeting young adults
Michaela Graham, MPH – Applying a public health framework to injury prevention program development and implementation
Melissa Hockaday, MSN, ACNP-BC, TCRN – Model program principles and development
Katie Hokanson – Statewide intervention strategies and how hospital programs can combine efforts
Laurie Punch, MD – Life outside of violence: City-wide multi-agency effort to offer high-level violence prevention & increase data sharing

Developing a Trauma Quality & Safety Program
Presented by the EAST Quality, Safety, & Outcomes Committee
Location: Room 502-503, 5th Floor
Operationalizing the Trauma PI Plan:
Oscar Guillamondegui, MD, MPH – Multidisciplinary Teams
Jorie Klein, RN, BSN – Data Collection & Training

Trauma Registry: Essentials of Trauma Registries & Other Data Resources
Joan Pirrung, MSN, APRN, ACNS-BC – Trauma Registry
Elliott R. Haut, MD, PhD – Audits & National Benchmarks

Trauma Metrics: TQIP
Kevin Schuster, MD, MPH – Interpretation & Variance Identification
Bruce Crookes, MD – Using Data to Change Practice

Trauma Quality & Safety Committee
Christopher Dente, MD – Membership-Multidisciplinary
Sean Elwell, MSN, RN, NE-BC, TCRN, EMT – Creating the PI Agenda

Trauma Peer Review
Jose Diaz, MD – Peer Review: Institutional Integration & Risk Management
Glen Tinkoff, MD – Just Culture: Confidentiality & Peer Protection

12:00 pm-12:30 pm **Flag Presentation and Opening Remarks**
Location: JW Grand Ballrooms 6-8

SCIENTIFIC SESSION I – RAYMOND H. ALEXANDER, MD RESIDENT PAPER COMPETITION
Presiding: Andrew C. Bernard, MD & Rachel L. Warner, DO
12:30 pm-2:30 pm
Location: JW Grand Ballrooms 6-8

12:30 pm	#1	PERCEIVED LOSS OF SOCIAL SUPPORT AFTER NON-NEUROLOGIC INJURY NEGATIVELY IMPACTS RECOVERY Presenter: Bryan Carr, MD Discussant: Stephanie Bonne, MD
12:50 pm	#2	COLD-STORED WHOLE BLOOD PLATELET FUNCTION IS PRESERVED IN INJURED CHILDREN WITH HEMORRHAGIC SHOCK Presenter: Christine M. Leeper, MD Discussant: Randall S. Burd, MD
1:10 pm	#3	EFFICACY OF INTERMITTENT VERSUS STANDARD REBOA IN A LETHAL SOLID ORGAN INJURY MODEL Presenter: John P. Kuckelman, DO Discussant: Joseph J. DuBose, MD
1:30 pm	#4	ASSOCIATION BETWEEN ENHANCED OVERNIGHT OPERATING ROOM ACCESS AND MORTALITY FOR TRUE LIFE-THREATENING SURGICAL DISEASE Presenter: Vijaya T. Daniel, MD, MPH Discussant: Kimberly A. Davis, MD, MBA
1:50 pm	#5	REGIONAL DISPARITIES IN ACCESS TO VERIFIED BURN CENTER CARE IN THE UNITED STATES Presenter: Heather E. Carmichael, MD Discussant: Laura S. Johnson, MD
2:10 pm	#6	THE BRAIN TRAUMA OUTCOME SCORE (BTOS): ESTIMATING MORTALITY AFTER A TRAUMATIC BRAIN INJURY Presenter: Mohammad Hamidi, MD Discussant: Deborah M. Stein, MD, MPH

2:30 pm-2:45 pm Break – Refreshments in the Exhibit Area

SCIENTIFIC SESSION II – RAYMOND H. ALEXANDER, MD RESIDENT PAPER COMPETITION

Presiding: Elliott R. Haut, MD, PhD & John P. Kuckelman, DO

2:45 pm-4:25 pm

Location: JW Grand Ballrooms 6-8

2:45 pm	#7	HOW LOW CAN YOU GO: ACHIEVING POST-OPERATIVE OUTPATIENT PAIN CONTROL WITHOUT OPIOIDS Presenter: Alex Bulanov, DO Discussant: Andrew C. Bernard, MD
3:05 pm	#8	AN INFECTIOUS PULMONARY INSULT POST-TBI WORSENS SUBSEQUENT SPATIAL LEARNING AND NEUROLOGICAL OUTCOMES Presenter: Christina Jacovides, MD Discussant: Matthew E. Lissauer, MD
3:25 pm	#9	PREPERITONEAL BALLOON TAMPONADE AND RESUSCITATIVE BALLOON OCCLUSION OF THE AORTA: ALTERNATIVES TO OPEN PACKING FOR PELVIC FRACTURE-ASSOCIATED HEMORRHAGE Presenter: Woo Do, MD Discussant: Ronald B. Tesoriero, MD
3:45 pm	#10	FUNCTIONAL RECOVERY AND POSTTRAUMATIC STRESS DISORDER AFTER INJURY: EDUCATION IS AN IMPORTANT PREDICTOR Presenter: Juan P. Herrera-Escobar, MD Discussant: Joseph V. Sakran, MD, MPH, MPA
4:05 pm	#11	EARLY INSULIN THERAPY ABROGATES STRESS ASSOCIATED HYPERGLYCEMIA EFFECTS ON THE GLYCOCALYX-ENDOTHELIAL VASCULAR BARRIER Presenter: Jonathan Martin, MD Discussant: Alicia M. Mohr, MD

End of Raymond H. Alexander, MD Resident Paper Competition

4:30 pm-5:30 pm **Opening Keynote – Presidential Address**
EAST: A Legacy of Inclusion
Andrew C. Bernard, MD, FACS
Location: JW Grand Ballrooms 6-8

5:40 pm-6:40 pm **EAST Annual Business Meeting –** *Open to all EAST Members*
Location: JW Grand Ballrooms 6-8

THURSDAY, JANUARY 17, 2019

7:00 am-8:10 am
No Suit, No Problem Networking Breakfast
Presented by the EAST Career Development Committee
Location: JW Grand Ballroom 5

8:15 am-9:00 am
EAST Annual Oriens Presentations
Presented by the EAST Career Development Committee
Supported by an unrestricted grant from the Polk Family Charitable Foundation
Location: JW Grand Ballrooms 6-8
8:20 am-8:50 am Keynote Address
The Yin and Yang of Life as a Surgeon
Andrew B. Peitzman, MD, FACS

8:50 am-9:00 am 2019 EAST Oriens Essay Presentations
Resident Winner – Danby Kang, MD
Fellow Winner – Lisa M. Kodadek

9:00 am-10:00 am **Parallel Plenary Sessions**

Engage the Masters
Presented by the EAST Career Development Committee
Location: JW Grand Ballrooms 6-8
Moderators: Eric Bradburn, DO, Stefan Leichtle, MD, Gregory Peck, DO, & Ayodele Sangosanya, MD
Masters: Amy J. Goldberg, David H. Livingston, MD, & Kenneth L. Mattox, MD
Case Presentations:
Gabrielle E. Hatton, MD – Austere Environment Case
Megan T. Quintana, MD – Trauma Case
Charles Fredericks, MD – Emergency General Surgery Case

From Burnout to Suicide: How Do We Protect Ourselves & Each Other?
Presented by the EAST Mentoring Committee
Location: JW Grand Ballroom 5
Moderator: Thomas Duncan, DO
Speakers:
Sharmila Dissanaike, MD - Risk Factors associated with healthcare related burnout/depression
Joseph Sakran, MD, MPH, MPA - Treatment options for individuals facing healthcare related burnout/depression
Michael Sise, MD - Tools/preventive strategies for healthcare providers facing burnout/depression

10:00 am-10:15 am Morning Break – Visit the Exhibit Hall – JW Grand Ballrooms 1-4

PARALLEL SCIENTIFIC SESSION III-A – Clinical Trauma & Resuscitation
Presiding: A. Britton Christmas, MD & Bruce Crookes, MD
10:15 am-12:15 pm
Location: JW Grand Ballrooms 6-8

10:15 am	# 12	BETTER UNDERSTANDING THE UTILIZATION OF DAMAGE CONTROL LAPAROTOMY: A MULTI-INSTITUTIONAL QUALITY IMPROVEMENT PROJECT Presenter: John A. Harvin, MD Discussant: Bryce R.H. Robinson, MD, MS
10:35 am	#13	A SINGLE-CENTER PROSPECTIVE RANDOMIZED STUDY COMPARING THE EFFECTIVENESS OF 14 FRENCH PERCUTANEOUS CATHETERS(PIGTAIL) VERSUS 28-36 FRENCH CHEST TUBE IN THE MANAGEMENT OF TRAUMATIC HEMOTHORAX/HEMOPNEUMOTHORAX Presenter: Zachary M. Bauman, DO, MHA Discussant: Mark J. Seamon, MD
10:55 am	#14	PREDICTORS OF POST-TRAUMATIC RETAINED HEMOTHORAX: RESULTS OF AN EAST MULTI-INSTITUTIONAL TRIAL Presenter: Sarah A. Moore, MD Discussant: Narong Kulvatunyou, MD
11:15 am	#15	ANTICOAGULATION THERAPY IN PATIENTS WITH TRAUMATIC BRAIN INJURY (ACT-TBI): AN EAST MULTICENTER PROSPECTIVE STUDY Presenter: Kazuhide Matsushima, MD Discussant: Bellal Joseph, MD
11:35 am	#16	SAFETY PROFILE AND IMPACT OF LOW-TITER GROUP O WHOLE BLOOD FOR EMERGENCY USE IN TRAUMA Presenter: James Williams, BS Discussant: Lucy Z. Kornblith, MD
11:55 am	#17	PROLONGED PRE-HOSPITAL TREATMENT WITH ADENOSINE, LIDOCAINE, AND MAGNESIUM HAS INFERIOR SURVIVAL COMPARED TO CURRENT TACTICAL COMBAT CASUALTY CARE RESUSCITATION IN A PORCINE MODEL OF HEMORRHAGIC SHOCK Presenter: Remealle A. How, MD Discussant: Matthew J. Eckert, MD

PARALLEL SCIENTIFIC SESSION III-B – COX-TEMPLETON INJURY PREVENTION PAPER COMPETITION

Presiding: Joseph V. Sakran, MD, MPH, MPA & Tanya L. Zakrison, MD, MPH

10:15 am – 12:15 pm

Location: JW Grand Ballroom 5

10:15 am	#18	USING THE TRAUMA REGISTRY TO GUIDE YOUR INJURY PREVENTION PROGRAMS Presenter: Christopher A. Missler, RN, BSN Discussant: Sean Elwell, MSN, RN, NE-BC, TCRN, EMT
10:35 am	#19	DETERMINING THE INCIDENCE OF DISTRACTON AMONG TRAUMA PATIENTS IN ALL MODES OF TRANSPORTATION Presenter: Brittany Le, BS Discussant: Jamie J. Coleman, MD
10:55 am	#20	PREVENTING TEEN DISTRACTED DRIVING: A PROGRAM FROM INITIATION THROUGH TO EVALUATION Presenter: Peter Ehrlich, MD, MSc, H BSc Discussant: Shannon M. Foster, MD
11:15 am	#21	FALL PREVENTION INITIATIVE: A FALL SCREENING PILOT STUDY IN THE AMBULATORY SETTING Presenter: Susan Kartiko, MD, PhD Discussant: Linda Ding, MD
11:35 am	#22	GOOGLE STREET VIEW ASSESSMENT OF ENVIRONMENTAL SAFETY FEATURES AT THE SCENE OF PEDESTRIAN INJURY Presenter: Patrick D. Isola, BSChem Discussant: Hee Soo Jung, MD
11:55 am	#23	BICYCLE LANES: ARE WE RUNNING IN CIRCLES OR CYCLING IN THE RIGHT DIRECTION? Presenter: James Palmer, MS Discussant: Amy Stewart, MD

End of Cox-Templeton Injury Prevention Paper Competition

12:15 pm-1:30 pm **Lunch on your own**

1:30 pm-2:30 pm **Parallel Plenary Sessions**

EAST Master Class Surgical Videos Session

Presented by the EAST Annual Scientific Assembly Committee

Location: JW Grand Ballrooms 5

Moderators: Matthew Lissauer, MD & Adrian Maung, MD

- The Bigger They Are: Video Tips & Techniques for Managing Acute Care Surgery Emergencies in the Post-Bariatric Surgery Patient – Dominic M. Forte, MD, Madigan Army Medical Center
- From IPOM to TAR: Complex Minimally Invasive Abdominal Wall Reconstruction is in the Armamentarium of the Acute Care Surgeon – Andrea Pakula, MD, Kern Medical Center
- Successful Management of Injuries to the Portal Triad – Kennith Conley Coleman, MD, West Virginia University
- Ultrasound in Trauma Resuscitation & Critical Care with Continuous Hemodynamic Trans-Esophageal Echocardiographic Guidance – Timothy Nowack, MD, Mercer University School of Medicine
- The Future is Now: Utilization of Evolving Technology in Trauma Care – Eugene F. Reilly, MD, Reading Trauma Center

1:30 pm-2:30 pm **Parallel Plenary Sessions**

Scientific Papers That Should Have Changed Your Practice
Presented by the EAST Manuscript & Literature Review Committee
Location: JW Grand Ballroom 5
Moderator: Damien Carter, MD
Speakers:
Gerard Baltazar, DO – Surgical Critical Care Manuscripts from 2018
Vanessa Ho, MD, MPH – Trauma Manuscripts from 2018
Nathan Mowery, MD – Emergency General Surgery from 2018

QUICK SHOTS PARALLEL SESSION I
Presiding: William C. Chiu, MD & Jeffrey A. Claridge, MD, MS
2:30 pm- 3:30 pm
Location: JW Grand Ballrooms 6-8

2:30 pm	#1	EAST & AAST MEMBER ATTITUDES ON FIREARM INJURY PREVENTION AND ADVOCACY Presenter: Deborah Kuhls, MD
2:36 pm	#2	MASS SHOOTINGS IN AN URBAN TRAUMA SYSTEM: A SILENT EPIDEMIC Presenter: Jessica Beard, MD, MPH
2:42 pm	#3	INCREASED COSTS OF TRAUMA ACTIVATION FOR MINIMALLY INJURED PATIENTS Presenter: Michael T. Scott, MD
2:48 pm	#4	OXYGEN MICROBUBBLES CORRECT ACUTE HYPOXIA IN A RAT MODEL OF SMOKE INHALATION INJURY Presenter: Keely Buesing, MD
2:54 pm	#5	CORRELATION BETWEEN PTT AND XA VALUES IN AN ICU Presenter: Lauren Steward, MD
3:00 pm	#6	SUCCESSFUL MANAGEMENT OF SELECT RADIOGRAPHIC INTRACRANIAL INJURIES IN A RURAL TRAUMA CENTER WITHOUT NEUROSURGEON COVERAGE USING A MODIFIED BRAIN INJURY GUIDELINE Presenter: Mathew Edavettal, MD, PhD
3:06 pm	#7	INTRODUCTION OF A COLLABORATIVE PALLIATIVE CARE INITIATIVE ON AN ACUTE CARE SURGERY SERVICE Presenter: Tess H. Aulet, MD
3:12 pm	#8	UNDERTRIAGE DESPITE USE OF GERIATRIC-SPECIFIC TRAUMA TEAM ACTIVATION GUIDELINES: WHO ARE WE MISSING? Presenter: Ram V. Anantha, MD, MSc
3:18 pm	#9	ATRIAL FIBRILLATION AND A FALL: RISK SCORES DO NOT ACCURATELY STRATIFY FOR STROKE OR BLEED IN ELDERLY FALL VICTIMS Presenter: Bryan Carr, MD
3:24 pm	#10	EARLY ANALYSIS OF LEVEL IV TRAUMA CENTERS WITHIN AN ORGANIZED TRAUMA SYSTEM Presenter: Tawnya Vernon, BA

Quick Shots Parallel Session II
Presiding: Jason W. Smith, MD, PhD & Alison M. Wilson, MD
2:30 pm-3:30 pm
Location: JW Grand Ballroom 5

2:30 pm	#11	VALIDATION OF THE AMERICAN ASSOCIATION FOR THE SURGERY OF TRAUMA (AAST) EMERGENCY GENERAL SURGERY SCORE FOR ACUTE APPENDICITIS: A POST-HOC SECONDARY ANALYSIS Presenter: Georgia Vasileiou
2:36 pm	#12	A COMPARATIVE STUDY ON THE EFFICACY OF HYPERTONIC SALINE BOLUS OR CONTINUOUS INFUSION FOR THE TREATMENT OF CEREBRAL EDEMA AND ELEVATED INTRACRANIAL PRESSURE FOLLOWING TRAUMATIC BRAIN INJURY Presenter: Matthew Lamb, MD
2:42 pm	#13	A NOVEL USE OF THE TRAUMA REGISTRY: INCIDENTAL FINDINGS IN THE TRAUMA PATIENT Presenter: Jordan Shealy, MD
2:48 pm	#14	A NOVEL PROTOCOL TO MAINTAIN CONTINUOUS ACCESS TO THAWED PLASMA AT A RURAL TRAUMA CENTER Presenter: Cara Hannigan, MD
2:54 pm	#15	GENDER DIFFERENCES IN NATIONWIDE OUTCOMES AND HOSPITALIZATION COSTS FOR INTIMATE PARTNER VIOLENCE Presenter: Tanya L. Zakrison, MD, MPH
3:00 pm	#16	LIMITATIONS OF AVAILABLE BLOOD PRODUCTS FOR MASSIVE TRANSFUSION DURING MASS CASUALTY EVENTS AT US LEVEL I TRAUMA CENTERS Presenter: James Williams, BS
3:06 pm	#17	YOUNG LIVES CUT SHORT-THE RELATIONSHIP BETWEEN FIREARMS AND PEDIATRIC SUICIDE Presenter: Robert J. McLoughlin, MD
3:12 pm	#18	PREDICTING LENGTH OF STAY FOR TRAUMA AND EMERGENCY GENERAL SURGERY PATIENTS Presenter: Benjamin Stocker, MD
3:18 pm	#19	COMPARING REALITY TO CONSENSUS: REPORTED OPIOID USE VS. CLINICIAN CONSENSUS RECOMMENDATIONS Presenter: Kortney A. Robinson, MD
3:24 pm	#20	HIGHER INJURY SEVERITY SCORE IS ASSOCIATED WITH INFLAMMATORY STATE AND SEVERE ANEMIA Presenter: Elizabeth S. Miller, MD

3:30 pm-3:45 pm Afternoon Break – Visit the Exhibit Hall – JW Grand Ballrooms 1-4

3:45 pm-5:00 pm **Parallel Plenary Sessions**

EAST Presidential Plenary Session - #EAST4All: An Introduction to the EAST Equity, Quality, & Inclusion in Trauma Surgery Practice Ad Hoc Task Force
Presented by the EAST Equity, Quality, & Inclusion in Trauma Surgery Practice Ad Hoc Task Force
Location: JW Grand Ballrooms 6-8
Moderators: Tanya L. Zakrison, MD, MPH & Brian Williams, MD
Speakers:
Patricia Byers, MD & Kimberly Joseph, MD – Testimonial: Implicit Gender Bias in Early Career
Bellal Joseph, MD & William Lynn Weaver, MD – Testimonial: Racial Bias & Early Career
Sandra DiBrito, MD, PhD & Paula Ferrada, MD - Testimonial: Gender Identity & Sexual Orientation Bias

Stephanie Bonne, MD & Rishi Rattan, MD – Sticky Floors & Glass Ceilings in Trauma: How Gender Disparity & Unconscious Bias Affects Trauma Teams & Leadership in Trauma

D'Andrea Joseph, MD, Haytham Kaafarani, MD & Ariel Santos, MD – Racial Inequity in Trauma Surgery: How Racism or Country of Origin Bias Prevents Trauma Teams from Thriving

Brian Williams, MD, Robert Winfield, MD & Tanya Zakrison, MD, MPH – How EAST is Taking a Leadership Role in Identifying & Mitigating Discrimination & Bias to Encourage Diversity in our Profession

Integration of a Best Practice Radiology Guideline in the Trauma Population
Presented by the Society of Trauma Nurses (STN)
Location: JW Grand Ballroom 5
Moderator: Elizabeth Seislove, RN, MSN, CCRN
Speakers:
Mark Bernstein, MD – Principles of the Development of the Radiology Best Practice Guideline & Application to Practice
Gail Tominaga, MD – Review of the TQIP Radiology Best Practice Guideline
Jorie Klein, RN, BSN – Implementation of the Radiology Guideline

PARALLEL QUICK SHOTS SESSION III
Presiding: Daniel J. Bonville, DO & Robert D. Winfield, MD
5:00 pm – 6:15 pm
Location: JW Grand Ballrooms 6-8

5:00 pm	#21	PLATELET INHIBITION IN SEVERELY-INJURED CHILDREN IS ASSOCIATED WITH TRAUMATIC BRAIN INJURY Presenter: Christine M. Leeper, MD
5:06 pm	#22	CRITICAL TRAUMATIC BRAIN INJURY IS ASSOCIATED WITH WORSE COAGULOPATHY Presenter: Daniel Cucher, MD, MS
5:12 pm	#23	ABDOMINAL SEATBELT SIGN: EXCLUSION OF HOLLOW VISCOUS INJURY IS EASIER THAN PREDICTION Presenter: Patrick Delaplain, MD
5:18 pm	#24	SAVE 2.0: SIMULATION TEAM-TRAINING FOR PENETRATING INJURIES Presenter: Emily J. Onufer, MD, MPH
5:24 pm	#25	INJURIES RESULTING FROM "AIR GUNS" AT FIVE PEDIATRIC LEVEL I TRAUMA CENTERS Presenter: Nadja Apelt, MD
5:30 pm	#26	USE OF HELICOPTERS FOR RETRIEVAL OF TRAUMA PATIENTS: A GEOSPATIAL ANALYSIS Presenter: Weston A. Smedley, BSc

5:36 pm #27 UNPLANNED READMISSION AFTER TRAUMATIC INJURY: A LONG-TERM NATIONWIDE ANALYSIS
Presenter: Hiba Ezzeddine, MD

5:42 pm #28 RISK FACTORS FOR INTENSIVE CARE UNIT ADMISSION FOR TRAUMA PATIENTS ADMITTED TO THE FLOOR: A TQIP ANALYSIS
Presenter: Michael Mazzei, MD, MS

5:48 pm #29 EFFECT OF HEMORRHAGE CONTROL ADJUNCTS IN SEVERE PELVIC FRACTURE: A MULTI-INSTITUTIONAL STUDY
Presenter: Juan Duchesne, MD

5:54 pm #30 INTEGRATING COMORBIDITIES IN TRAUMA INJURY SEVERITY SCORING SYSTEM: DOES IT MATTER?
Presenter: Adel Elkbuli, MD, MPH

6:00 pm #31 ELECTRONIC MONITORING OF PRACTICE MANAGEMENT GUIDELINES: THE FUTURE OF COMPLIANCE
Presenter: Abby McCall, PA-C

6:06 pm #32 EXPRESSION OF HIGH MOBILITY GROUP BOX 1 PROTEIN IN A POLYTRAUMA MODEL TREATED WITH ECLS AT GROUND LEVEL AND HIGH ALTITUDE
Presenter: Jae Choi, PhD, DVSc

PARALLEL QUICK SHOTS SESSION IV
Presiding: Brad Dennis, MD & Paula Ferrada, MD
5:00 pm-6:15 pm
Location: JW Grand Ballroom 5

5:00 pm #33 PHENYLEPHRINE PROTECTS THE ENDOTHELIAL GLYCOCALYX IN A CELLULAR MODEL FOR SHOCK
Presenter: Jessica Friedman, MD

5:06 pm #34 DEVELOPMENT OF A CLINICAL TRACHEOSTOMY SCORE TO IDENTIFY SPINAL CORD INJURY PATIENTS REQUIRING PROLONGED VENTILATOR SUPPORT
Presenter: Dane Scantling, DO, MPH

5:12 pm #35 A SYSTEMATIC APPROACH FOR TRAUMA TEAM MEMBERS (TTMS) TO COPE AFTER MASS CASUALTY INCIDENTS (MCIS)
Presenter: Mayur Narayan, MD, MPH, MBA, MHPE

5:18 pm #36 QUANTIFYING GEOGRAPHIC BARRIERS TO TRAUMA CARE: URBAN-RURAL VARIATION IN PREHOSPITAL MORTALITY
Presenter: Molly P. Jarman, PhD, MPH

5:24 pm #37 ORGAN DONATION AFTER TRAUMA; A 30 YEAR REVIEW
Presenter: Adam M. Ackerman, MD

5:30 pm #38 ANALYSIS OF AN AMERICAN COLLEGE OF SURGEONS COMMITTEE ON TRAUMA (ACS-COT) APPROVED PILOT PROJECT TO INCREASE PROVIDER COMMUNICATION DURING INTER-HOSPITAL TRAUMA PATIENT TRANSFERS
Presenter: Brian Fletcher, MS, RN, ACNP-BC

5:36 pm #39 PATHWAY TO SUCCESS: IMPLEMENTATION OF AN INDEPENDENT MULTIPROFESSIONAL ACUTE TRAUMA HEALTHCARE TEAM DECREASES LENGTH OF STAY IN SEVERE TRAUMATIC BRAIN AND SPINAL CORD INJURY PATIENTS REQUIRING TRACHEOSTOMY
Presenter: Alvin Perry, MD

THURSDAY, JANUARY 17, 2019 continued

5:42 pm #40 MANAGEMENT AND OUTCOMES OF MODERN WARTIME CERVICAL CAROTID INJURY
Presenter: Patrick F. Walker, MD

5:48 pm #41 THE BEERS CRITERIA: NOT JUST FOR GERIATRICS ANYMORE? ANALYSIS OF BEERS MEDICATIONS IN NON-GERIATRIC TRAUMA PATIENTS AND THEIR ASSOCIATION WITH FALLS
Presenter: Adam Maerz, MD

5:54 pm #42 PREVENTABLE DEATH AND INTERPERSONAL VIOLENCE IN THE UNITED STATES: WHO CAN BE SAVED?
Presenter: Heather E. Carmichael, MD

6:00 pm #43 MAINTAINING THE HIGH: ILLICIT DRUG USE IS PREDICTIVE OF DELIRIUM AND MORTALITY IN THE ICU
Presenter: Vaidehi Agrawal, PhD

6:06 pm #44 TRANEXAMIC ACID ADMINISTRATION AND NEUROLOGIC OUTCOMES IN A COMBAT SETTING: IS TXA IDEAL FOR TBI?
Presenter: Douglas R. Morte, MD

FRIDAY, JANUARY 18, 2019

7:00 am-7:45 am **EAST Awards Ceremony & Recognition**
Location: JW Grand Ballrooms 6-8

7:45 am- 8:45 am **Parallel Plenary Session & Quick Shots Session V**

There are No Narcotics Left: Now What? Contemporary Options for Pain Management
Presented by the EAST Guidelines Committee
Location: JW Grand Ballrooms 6-8
Moderator: Babak Sarani, MD
Speakers:
Jonathan Messing, ACNP – Managing Patient Expectations & Alternatives to Conventional Medicine
Tom Scott, MD – Operative Management of Injury with the Goal of Lessing Pain & Role of Intraoperative Blocks
Kristen Conrad-Schnetz, DO - Improving Pain Control through Peer Recovery and the Trauma Survivors Network

QUICK SHOTS SESSION V – Clinical Science & Trauma Critical Care
Presiding: Daniel J. Grabo, MD & David S. Morris, MD
7:45 am-8:45 am
Location: JW Grand Ballroom 5

7:45 am #45 ARTIFICIAL NEURAL NETWORKS CAN PREDICT TRAUMA VOLUME AND ACUITY: A MULTICENTER STUDY
Presenter: Brad Dennis, MD

7:51 am #46 CITATION RATES OF INJURED INTOXICATED DRIVERS - HAVE WE IMPROVED OVER TIME?
Presenter: Michelle Yen, BA

7:57 am #47 HYPOBARIA WITH AND WITHOUT VIBRATION REDUCED WHITE BLOOD CELL COUNT AND INFLAMMATORY CYTOKINES 48 HOURS AFTER SIMULATED AEROMEDICAL EVACUATION IN BLAST TBI RATS
Presenter: Debra Malone, MD

8:03 am #48 REDEFINING MINIMAL TRAUMATIC BRAIN INJURY (mTBI): A NOVEL CT CRITERIA TO PREDICT INTERVENTION
Presenter: Michael R. Arnold, MD

8:09 am #49 HIGH-PERFORMANCE ACUTE CARE HOSPITALS: EXCELLING ACROSS MULTIPLE EMERGENCY GENERAL SURGERY OPERATIONS IN THE GERIATRIC PATIENT
Presenter: Michael P. DeWane, MD

8:15 am #50 TWO URGENCY CATEGORIES, SAME OUTCOME: NO DIFFERENCE AFTER "THERAPEUTIC" VS "PROPHYLACTIC" FASCIOTOMY
Presenter: Megan T. Quintana, MD

8:21 am #51 DRIVING BIOLOGY: THE EFFECT OF STANDARDIZED WOUND MANAGEMENT ON WOUND BIOMARKER PROFILES
Presenter: Christopher J. Dente, MD

8:27 am #52 ELDERLY PATIENTS PRESENTING TO A LEVEL I TRAUMA CENTER WITH A POLST FORM: A PROPENSITY-MATCHED ANALYSIS
Presenter: Jessica Ballou, MD

8:33 am #53 LAPAROSCOPIC VS OPEN COLECTOMY FOR COLONIC VOLVULUS: A NSQIP DATABASE REVIEW
Presenter: Jordan M. Kirsch, DO

8:39 am #54 ESTABLISHING THE LIMITS OF AGGRESSIVE RESUSCITATION IN PATIENTS WITH GUNSHOT WOUNDS TO THE BRAIN - AN EAST MULTICENTER STUDY
Presenter: Leigh A. Robinson, MD

8:45 am-9:45 am **Closing Keynote – Scott B. Frame, MD Memorial Lecture**
The Business of Research: An Exploration Into the Experiences Gained from a Career in Academia & Industry
Juan B. Ochoa, MD, FACS, FCCM
Location: JW Grand Ballrooms 6-8

PARALLEL SCIENTIFIC SESSION IV-A –Critical Care
Presiding: Jose Pascual, MD, PhD & Alexander Eastman, MD, MPH
10:00 am-12:00 pm
Location: JW Grand Ballrooms 6-8

10:00 am #24 INFECTION AFTER PENETRATING BRAIN INJURY: AN EASTERN ASSOCIATION FOR THE SURGERY OF TRAUMA MULTICENTER TRIAL
Presenter: Laura Harmon, MD
Discussant: Mayur B. Patel, MD, MPH

10:20 am #25 A CONCOMITANT LONG BONE FRACTURE WORSENS TRAUMATIC BRAIN INJURY RECOVERY: A TIME DEPENDENT PROCESS
Presenter: Yujin Suto, MD, PhD
Discussant: Jeffrey J. Skubic, DO

10:40 am #26 OPTIMIZING ENERGY EXPENDITURE AND PULMONARY MECHANICS TO DECREASE VENTILATOR AND ICU DAYS
Presenter: Darwin Ang, MD, PhD, MPH
Discussant: Martin Avery, MD

11:00 am #27 MULTI-ORGAN FAILURE IN ARDS: EFFECTS OF ADJUNCT TREATMENTS ON END-ORGAN DAMAGE AND HISTOLOGICAL INJURY SEVERITY
Presenter: Jae Choi, PhD, DVSc
Discussant: Matthew E. Kutcher, MD

11:20 am #28 EXTERNAL VALIDATION OF A NOVEL DIGITAL SIGNATURE TO DETECT EARLY RESPIRATORY DETERIORATION OF ICU PATIENTS
Presenter: Rachael Callcut, MD, MSPH
Discussant: David Meyer, MD, MS

11:40 am #29 THE ACUTE INFLAMMATORY RESPONSE AFTER TRAUMA IS HEIGHTENED BY FRAILTY: A PROSPECTIVE EVALUATION OF INFLAMMATORY AND ENDOCRINE SYSTEM ALTERATIONS IN FRAILTY
Presenter: James Palmer, MS
Discussant: Scott C. Brakenridge, MD, MSCS

PARALLEL SCIENTIFIC SESSION IV-B – Emergency General Surgery& Trauma Systems
Presiding: Jeffry Nahmias, MD, MHPE & D. Dante Yeh, MD
10:00 am-12:00 pm
Location: JW Grand Ballroom 5

10:00 am	#30	MULTICENTER STUDY OF THE TREATMENT OF APPENDICITIS IN NORTH AMERICA: ACUTE, PERFORATED, AND GANGRENOUS (MUSTANG) – AN EAST MULTICENTER STUDY Presenter: D. Dante Yeh, MD Discussant: Rachael A. Callcut, MD, MSPH
10:20 am	#31	RE-EXAMINING "NEVER LETTING THE SUN RISE OR SET ON A BOWEL OBSTRUCTION" IN THE ERA OF ACUTE CARE SURGERY Presenter: Adrian Diaz, MD, MPH Discussant: Brian Yorkgitis, PA-C, DO
10:40 am	#32	ESCALATION OF MORTALITY AND RESOURCE UTILIZATION IN EMERGENCY GENERAL SURGERY TRANSFER PATIENTS Presenter: David D. Keeven Discussant: Nina Glass, MD
11:00 am	#33	THE AFTERMATH OF FIREARM VIOLENCE: SURVIVAL IS NOT "GOOD ENOUGH" Presenter: Michael Vella, MD Discussant: Robyn Richmond, MD
11:20 am	#34	LOCATION, LOCATION, LOCATION: UTILIZING NBATS-2 IN TRAUMA SYSTEM PLANNING Presenter: Jennings H. Dooley, BS Discussant: Shelby Resnick, MD
11:40 am	#35	DEFINING GEOGRAPHIC EMS COVERAGE IN TRAUMA SYSTEMS Presenter: Joshua B. Brown, MD, MSc Discussant: Farheen A. Qurashi, MD

1:15 pm-3:15 pm
Practice Management Guidelines (PMGs) Plenary Session
Presented by the EAST Guidelines Committee
Location: JW Grand Ballroom 5
Moderator: John J. Como, MD, MPH
PMGs scheduled to be presented (*subject to change*):

Injury Prevention
- Orthogeriatrics Management- Kaushik Mukherjee, MD, MSCI
- Alcohol-Related Trauma Recidivism Prevention: Hospital-Based Screening in Adult Populations – Lisa Kodadek, MD
- Prevention of Firearm Related Injuries with Gun Buyback Programs & Community-Based Violence Prevention Programs – Stephanie Bonne, MD

Pediatric Trauma
- Screening for Child Abuse in Young Children Presenting with Fractures – Ian Mitchell, MD

Surgical Critical Care
- Antimotility Agents in Diarrhea – Nikolay Bugaev, MD

Trauma
- Preperitoneal Packing for Pelvic Fracture Hemorrhage – Nikolay Bugaev, MD
- Management of Duodenal Trauma – Krista Haines, DO
- Presumptive Antibiotics for Tube Thoracostomy in Trauma – Cory Vatsaas, MD

FRIDAY, JANUARY 18, 2019 continued

1:15 pm-3:15 pm
You Have Entered the Twilight Zone: Late Career & Retirement Success for Surgeons
Presented by the EAST Seniors Committee
Location: Room 502-503, 5th Floor
Moderator: Ronald I. Gross, MD
Speakers:
Susan Briggs, MD – From Home Base to Foreign Lands
John Fortune, MD – A Surgeon's Transition from Active Clinical Practice: When & Why
Kimball Maull, MD – Staying Relevant & Enjoying Life – It IS Possible
Ronald Stewart, MD – The Finances of Surviving as a Surgeon – Before & After Practice

3:15 pm Scientific Program Adjourns

Paper #1
January 16, 2019
12:30 pm

PERCEIVED LOSS OF SOCIAL SUPPORT AFTER NON-NEUROLOGIC INJURY NEGATIVELY IMPACTS RECOVERY

Bryan Carr, MD*, Sarah Severance, MD, Teresa Maria Bell, PhD,
Ben L. Zarzaur, MD, MPH, FACS*
Indiana University

Presenter: Bryan Carr, MD

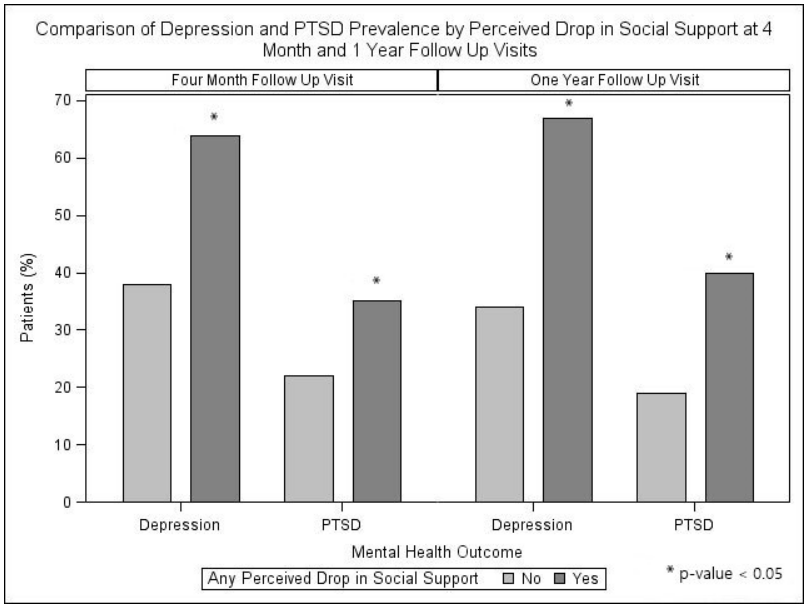
Discussant: Stephanie Bonne, MD, Rutgers New Jersey Medical School

Objectives: Traumatic injury is not only physically devastating, but also psychologically isolating, potentially leading to poor quality of life (QOL), depression and post-traumatic stress disorder (PTSD). Perceived social support (PSS) is associated with better outcomes in some populations. It is unknown if changes in PSS during recovery influence long-term outcomes following non-neurologic injury. We hypothesized that a single drop in PSS would be associated with lower QOL.

Methods: Patients =18 years old admitted to a Level 1 trauma center with injury severity score of >10, and no traumatic brain or spinal cord injury were enrolled. Demographic and injury data were collected at admission. Depression, PTSD, and Medical Outcomes Study Short Form 36 Mental Composite Score (SF-36 MCS) screenings were obtained during the initial hospitalization, 1, 2, 4, and 12 months post-injury. The Multidimensional Scale of PSS (MSPSS) was also administered at these time points. Patients with high MSPSS (>5) at baseline were included and patients that ever reported a score = 5 (DROP) were compared to those that remained high (STABLE). Outcomes were assessed at 4 and 12 months. $P<0.05$ was considered significant.

Results: 404 patients were included. 100 (35.7%) met DROP criteria at 4mo, and 104 (42.8%) at 1yr. There were no differences in gender, race, or mechanism of injury. DROP patients were less likely to have a significant other ($p=0.012$ at 4mo, $p<0.001$ at 1yr) or employment ($p=0.016$ at 4mo, $p=0.026$ at 1yr) compared to STABLE patients. At 4mo and 1yr, DROP patients were more likely to have PTSD, depression (Figure), and a lower SF-36 MCS ($p<0.001$, $p<0.001$).

Conclusions: Patients who perceive a drop in social support during the first year of recovery have poorer psychological outcomes. Identifying these socially frail patients provides an opportunity to develop targeted interventions and improve post-injury mental health



Prevalence of Depression and PTSD in patients who perceived a loss in social support at 4 months and 1 year after major trauma compared to those who did not.

Paper #2
January 16, 2019
12:50 pm

COLD-STORED WHOLE BLOOD PLATELET FUNCTION IS PRESERVED IN INJURED CHILDREN WITH HEMORRHAGIC SHOCK

Christine M. Leeper, MD, Mark Yazer, MD, Darrell Triulzi, MD,
Cladis Franklyn, MD, Richard Saladino, MD, Barbara A. Gaines, MD*
Children's Hospital of Pittsburgh

Presenter: Christine M. Leeper, MD

Discussant: Randall S. Burd, MD, Children's National Medical Center

Objectives: Recent data demonstrate the safety of uncrossmatched cold-stored whole blood (WB) transfusion in pediatric trauma patients. The hemostatic capabilities of platelets within the cold-stored WB unit has been demonstrated via in vitro studies and animal models. However, in vivo platelet function has not been evaluated in pediatric recipients of cold-stored WB transfusions

Methods: Injured children ≥3 years old and ≥15kg with hemorrhagic shock received up to 20 cc/kg of cold-stored, low titer (<50) anti-A and –B, leukoreduced, group O- WB during initial resuscitation. Patients were included if 1) they received WB and no conventional platelets, and 2) platelet count and TEG maximum amplitude (MA) were measured both before and after transfusion. These data and clinical outcomes (mortality, ICU LOS, hospital LOS and ventilator days) were compared to a cohort of pediatric trauma patients who received uncrossmatched red blood cells (RBC) and conventional warm-stored platelets (n=14)

Results: 22 children were included in the study; 14 in the component cohort and 8 in the WB cohort. Neither median post-transfusion platelet count (129 vs 135, p=0.32) nor function (TEG MA 59.5mm vs 60.2mm, p=0.92) differed significantly between whole blood and conventional platelet groups. Median (IQR) weight-adjusted platelet transfusion volume in the historical cohort was 4.1 (2.5-8.8) mL/kg vs 2.6 (2.0-4.3) mL/kg in the WB cohort (p=0.21). There was no difference between groups in age, race, mechanism of injury, ISS, and severe TBI. Further, outcomes including mortality, ICU LOS, hospital LOS and ventilator days were not significantly different between groups (all p>0.76)

Conclusions: The use of cold-stored uncrossmatched WB platelets in severely-injured children yields equivalent platelet counts and function as compared to conventional warm-stored platelet transfusion. Larger cohorts are required to confirm these findings.

Paper #3
January 16, 2019
1:10 pm

EFFICACY OF INTERMITTENT VERSUS STANDARD REBOA IN A LETHAL SOLID ORGAN INJURY MODEL

John P. Kuckelman, DO, Michael Derickson, MD, Morgan R. Barron, MD,
Cody Phillips, DO, Donald Moe, MD, Joseph Kononchik, PhD,
Shannon Marko, DVM, Matthew J. Eckert, MD*, Matthew J. Martin, MD, FACS*
Madigan Army Medical Center

Presenter: John P. Kuckelman, DO

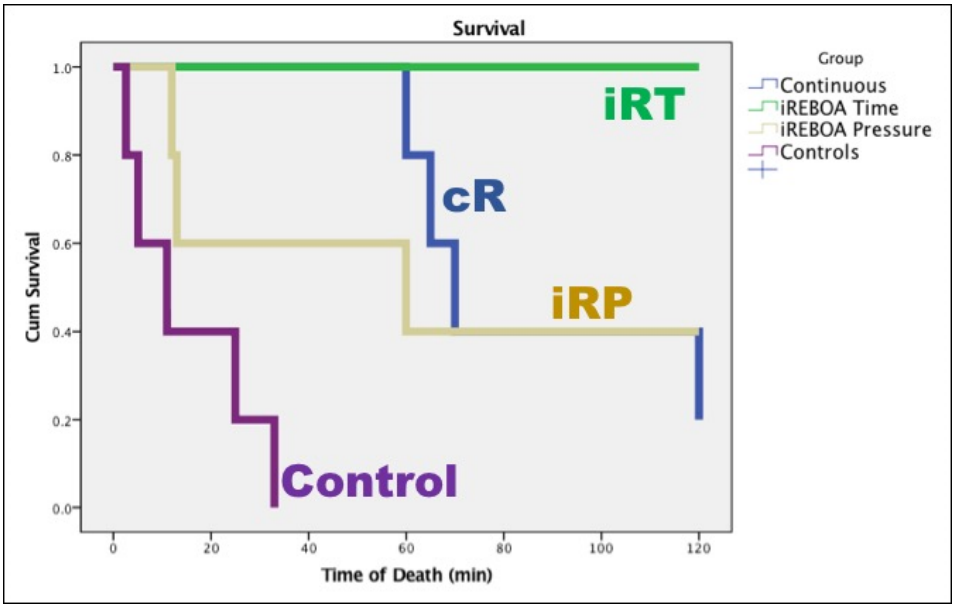
Discussant: Joseph J. DuBose, MD, United States Air Force

Objectives: High-grade solid organ injury is a major cause of mortality in trauma. Use of Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) can be effective but is limited by ischemia-reperfusion injury. Intermittent balloon inflation/deflation has been proposed as an alternative, but the safety and efficacy prior to operative hemorrhage control is unknown.

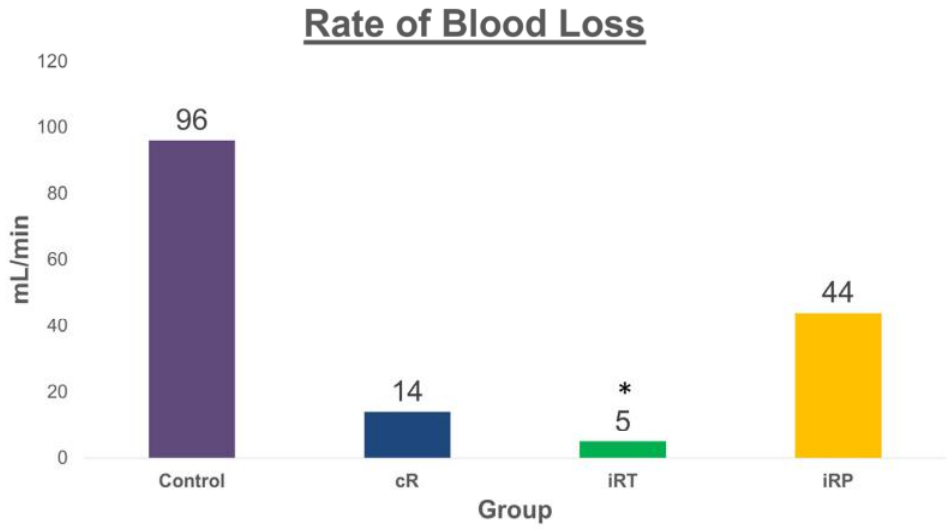
Methods: 20 male swine underwent standardized high-grade liver injury, then randomization to controls (N=5), 60-min continuous REBOA (cR, n=5), and either a time-based (10min inflation/3min deflation, iRT=5) or pressure-based (10min inflation if MAP<40 during deflation, iRP=5) intermittent schedule. Experiments were concluded after 120min or death (MAP<20).

Results: Improved overall survival was seen in the iRT group when compared to cR (see Figure 1, $p<0.01$). Bleeding rate in iRT (5.9mL/min) was significantly lower vs cR and iRP (see Figure 2, $p=0.02$). Both iR groups had higher final hematocrit (26% vs 21%) compared to cR ($p=0.03$). Although overall survival was lower in the iRP group, animals surviving to 120 min with iRP had decreased end organ injury (ALT 33 vs 40 in the iRT group, $p=0.03$) and lower lactate levels (13 vs 17) compared to the iRT group ($p=0.03$). No differences were seen between groups in terms of coagulopathy based on rotational thromboelastometry.

Conclusions: Intermittent REBOA is a potential viable adjunct to improve survival in lethal solid organ injury while minimizing the ischemia-reperfusion seen with full REBOA. The time-based intermittent schedule had the best survival and prolonged duration of tolerable zone 1 placement. Although the pressure-based schedule was less reliable in terms of survival, when effective it was associated with decreased acidosis and end-organ injury.



Survival curve comparison between the four groups.



Rate of total blood loss compared between the two groups.

Paper #4
January 16, 2019
1:30 pm

ASSOCIATION BETWEEN ENHANCED OVERNIGHT OPERATING ROOM ACCESS AND MORTALITY FOR TRUE LIFE-THREATENING SURGICAL DISEASE

Vijaya T. Daniel, MD, MPH, Amy Rushing, MD*, Angela M. Ingraham, MD, MS*, Kevin Ricci, MD, Anghela Paredes, MD, Adrian Diaz, MD, MPH, Didem Ayturk, MS, Holly Baselice, MPH, Scott Strassels, PharmD, PhD, Heena P. Santry, MD, MS, BA*
Ohio State University Wexner Medical Center

Presenter: Vijaya T. Daniel, MD, MPH

Discussant: Kimberly A. Davis, MD, MBA, Yale School of Medicine

Objectives: Few diseases truly require emergency surgery today. We investigated the relationship between access to OR and outcomes for patients with life-threatening emergency general surgery diseases (LT-EGS) at US hospitals.

Methods: In 2015, we surveyed 2,811 US hospitals on EGS practices, including how OR access is assured (e.g., OR staffing, block-time). 1,690 hospitals (60%) responded. We anonymously linked survey data to 2015 Statewide Inpatient Sample data (16 states) using American Hospital Association identifiers. We measured mortality for adults admitted with diagnoses (e.g., necrotizing fasciitis, perforated viscus, strangulated hernia) typically requiring emergency operation. Univariate and multivariable regression analyses, clustered by treating-hospital and adjusted for patient factors, were performed to examine hospital-level OR access variables.

Results: Overall, 5,197 patients were admitted with LT-EGS. The median age was 62 years (IQR 50, 75), with the majority having = 2 comorbidities (59%). 46% had =1 major complication and 7% died. The majority got care at hospitals lacking EGS block-time but with policies to ensure emergency access to the OR (Table 1). In multivariable analyses, overnight on-call, compared to in-house surgeons (ORs 1.6, 95% CI 1.19, 2.06), anesthesiologists (1.3, 95% CI 1.01, 1.73), and recovery room nurses (1.4, 95% CI 1.09, 1.88), were significant predictors of mortality. On-call vs. in-house OR nurses (OR 1.3 95% CI 0.99, 1.68) and scrub techs (OR 1.3 95% CI 0.98, 1.66) approached significance. Care by overnight surgeons without critical care coverage vs. those with critical care coverage was also a predictor of mortality (OR 1.5 95% CI 1.13, 1.95).

Conclusions: Greater OR availability is associated with decreased mortality. These findings have implications for the creation of EGS patient triage criteria and Acute Care Surgery Centers of Excellence.

Resource, Policy, or Procedure	% of Patients Exposed
Block Time for EGS	
None	60.0
0-1 days	3.8
2-4 days	4.7
≥5 days	31.5
Tiered System For Booking Emergent Surgical Cases	83.4
On-Call EGS Surgeon Free of Other Clinical Duties	26.6
In-house Overnight EGS Surgeon	
Always/Often	53.2
Sometimes	8.8
Rarely/Never	38.0
Overnight Scrub Technicians	
On-call	40.7
In-house	59.2
Overnight OR nurses	
On-call	41.0
In-house	59.0
Overnight Recovery Room Nurses	
On-call	64.8
In-house	33.4
Overnight Anesthesiologist	
On-call	39.2
In-house	58.3
EGS Surgeon Covering ICU Care	
Always/Often	41.0
Sometimes	12.6
Rarely/Never	46.4

Table 1. Hospital-level Resources, Policies, and Procedures to Assure Access to Surgical Care

Paper #5
January 16, 2019
1:50 pm

REGIONAL DISPARITIES IN ACCESS TO VERIFIED BURN CENTER CARE IN THE UNITED STATES

Heather E. Carmichael, MD, Arek Wiktor, MD, FACS, Robert McIntyre, MD, FACS, Anne L. Lambert Wagner, MD*, Catherine Velopulos, MD, MHS, FACS*
University of Colorado, Aurora

Presenter: Heather E. Carmichael, MD

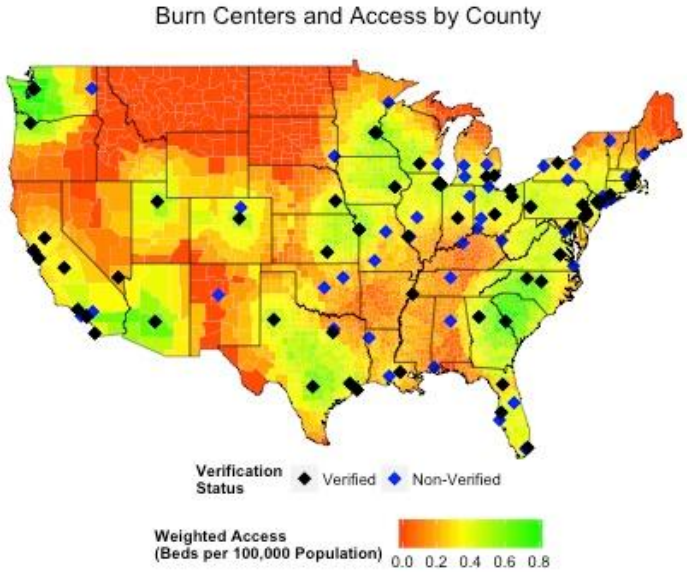
Discussant: Laura S. Johnson, MD
The Burn Center at MedStar Washing Hospital Center & Georgetown University School of Medicine

Objectives: Burn injuries result in 50,000 annual admissions. Despite joint referral criteria from the American College of Surgeons (ACS) and American Burn Association (ABA), many severely injured patients are not treated at verified centers with specialized care. Only one study explores regional variation in access to burn centers, focusing on flight or driving distance without considering the size of the population accessing that center. We hypothesize that disparities exist in access to verified centers, measured at a population level. We aim to identify a subset of non-verified centers that would most impact access to the highest level of burn care, if verified.

Methods: We collected ABA data for all verified and non-verified adult burn centers and geocoded their locations. We used county-level population data and a two-step floating catchment method, described in the primary care literature, to determine weighted access in terms of total beds available locally per population. We compared regions, as defined by the ABA, in terms of overall access. Low access was calculated to be less than 0.3 beds per 100,000 people using a conservative estimate.

Results: We identified 113 centers, 59 verified and 54 non-verified. Only 2.9% of the population lives in areas with no access (no verified center in 300 miles); however, 24.7% live in areas with low access. Significant regional disparities exist, with 37.3% of the population in the Southern Region having low access as compared to just 10.5% in the Northeastern Region. We identified 8 non-verified centers that would most impact access in areas with no or low access.

Conclusions: We found significant disparities in access to verified center burn care and determined non-verified centers with the greatest potential to increase access, if verified. Our future directions include identifying barriers to verification, such as lack of fellowship-trained burn surgeons or lack of hospital buy-in.



Map of weighted access measure to verified burn centers (beds available locally per population) at the county level. Locations of verified (black) and non-verified (blue) centers are shown.

Centers with greatest impact on populations with no access	Population affected
Center #1 (Western Region)	2.2 million
Center #2 (Western Region)	1.5 million
Center #3 (Western Region)	1.4 million
Total impact	***5.1 million (1.6% of US population)***
Centers with greatest impact on populations with low access	Population affected
Center #4 (Southern Region)	6.4 million
Center #5 (Southern Region)	6.1 million
Center #6 (Southern Region)	5.7 million
Center #7 (Southern Region)	5.4 million
Center #8 (Southern Region)	5.3 million
Total impact	***28.9 million (9.4% of US population)***

Summary of total population that could gain access if 8 high-impact centers (3 in areas with no access to burn care and 5 in areas with low access to burn care) were to become verified.

Paper #6
January 16, 2019
2:10 pm

THE BRAIN TRAUMA OUTCOME SCORE (BTOS): ESTIMATING MORTALITY AFTER A TRAUMATIC BRAIN INJURY

Mohammad Hamidi, MD, Muhammad Zeeshan, MD, Herb A. Phelan III, MD, FACS*, Terence O'Keeffe, MD, MSPH*, El Rasheid Zakaria, MD, Ph.D, Andrew L. Tang, MD*, Lynn Gries, MD, Narong Kulvatunyou, MD*, Ashley Northcutt, MD, Bellal Joseph, MD*
The University of Arizona

Presenter: Mohammad Hamidi, MD

Discussant: Deborah M. Stein, MD, MPH
R Adams Cowley Shock Trauma, University of Maryland School of Medicine

Objectives: Following Traumatic Brain Injury (TBI), a tool to predict the probability of mortality is required. The aim of this study is to develop a TBI specific tool, the Brain Trauma Outcome Score (BTOS) to predict mortality.

Methods: We performed 2-year analysis of all adult TBI patients in the TQIP. Measurements included age, ISS, transfusion within 1st 24 hours of injury, and GCS. Geriatric Trauma Outcome Score (GTOS=age+[ISSx25]+22[if RBC given]) and BTOS (GTOS?GCS) were calculated. AUROC was performed to determine the discriminatory power of GTOS and BTOS for mortality.

Results: For development model, we included 43627 TBI patients. Mean age was 53?21y, median ISS was 17[14-22], and median GCS was 14[12-15]. In-hospital mortality was 8.9%, and 6.5% received transfusion within 24h of injury. AUROC for predicting mortality was significantly higher for BTOS (0.881 [0.876-0.886]) compared to GTOS (0.766 [0.758-0.773]) (**Fig1a**). For external validation, we included 54063 TBI patients. Mean age was 54?21, median ISS was 17[14-21], and median GCS was 15[12-15]. Mortality rate was 7.6%, and 5.1% received transfusion. AUROC for predicting mortality was significantly higher for BTOS (0.901 [0.896-0.0.907]) compared to GTOS (0.767 [0.759-0.774]) (**Fig1b**). With increase in the BTOS score, the probability of mortality also increases in both developing and validating models (**Fig 2**).

Conclusions: Prognostication of traumatic brain injury outcomes is important. A novel prognostic model, the Brain Trauma Outcome Score can accurately predict in-hospital mortality in all TBI patients. BTOS is easy to calculate, and its predictive utility warrants further prospective validation.

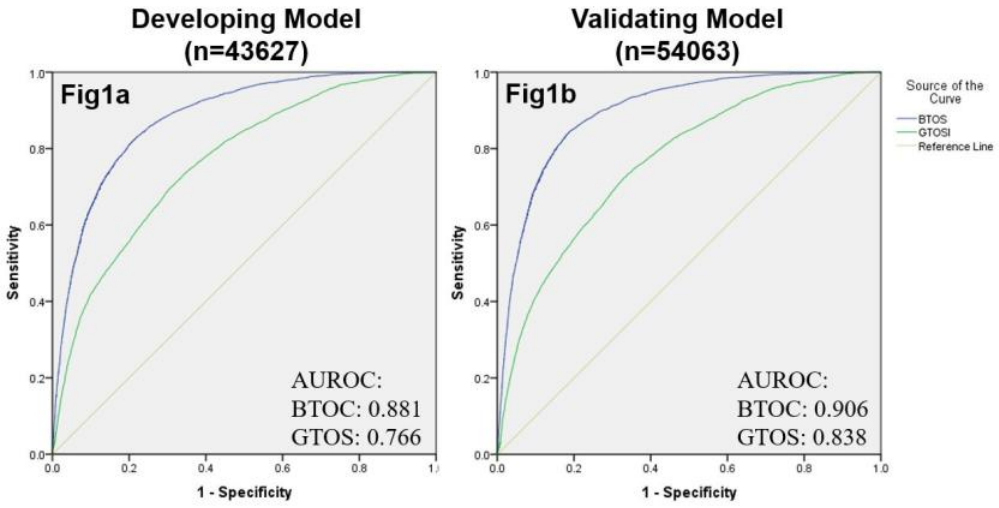


Figure 1a & 1b

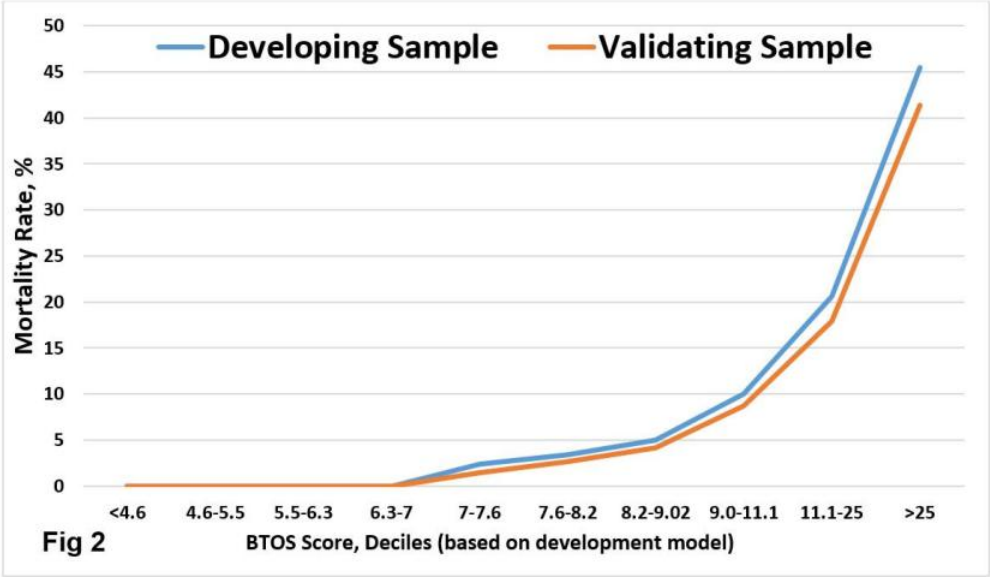


Figure 2

Paper #7
January 16, 2019
2:45 pm

HOW LOW CAN YOU GO: ACHIEVING POST-OPERATIVE OUTPATIENT PAIN CONTROL WITHOUT OPIOIDS

Alex Bulanov, DO, Fady Elabbasy, MD, Vasiliy Sim, MD, Asaf A. Gave, MD*, Samuel Hawkins, MD*, Melissa Panzo, MSN, RN, Leen Khoury, Stephen Cohn, MD*
Staten Island University Hospital

Presenter: Alex Bulanov, DO

Discussant: Andrew Bernard, MD, University of Kentucky College of Medicine

Objectives: Post-operative outpatient opioid over-prescription has played a significant role in the opioid epidemic. An average outpatient opioid prescription range is 150-350 oral morphine equivalent (OME) for a laparoscopic cholecystectomy or appendectomy, with 75 OME (10 pills of 5mg of oxycodone) being the lowest recommendation. Our hypothesis was that the addition of non-opioids to the outpatient pain control regimen would decrease the need for opioids.

Methods: In this prospective observational pilot study we prescribed a 3-day regimen of ibuprofen and acetaminophen to patients after uncomplicated cholecystectomies and appendectomies. An additional opioid prescription for 5 pills of 5mg oxycodone (37.5 OME) was given for breakthrough pain. During their post-operative visit we surveyed the adherence to the pain control regime, use of opioids, and adequacy of pain control.

Results: There were a total of 27 patients, 40% female. Most (74%) of surgeries were performed non-electively. The VAS pain score at home was significantly better than upon discharge (3.0 vs 5.4, p 0.02). The average number of opioid pills taken was 1.6 and 55% of patients did not take any opioids. All patients reported that their pain was adequately controlled. Nobody required additional prescriptions or visits the Emergency Department.

Conclusions: This study demonstrated that opioids can be eliminated in at least half of the patients, and that 5 pills of 5mg oxycodone is sufficient for outpatient pain control when a 3- day course of ibuprofen and acetaminophen is prescribed.

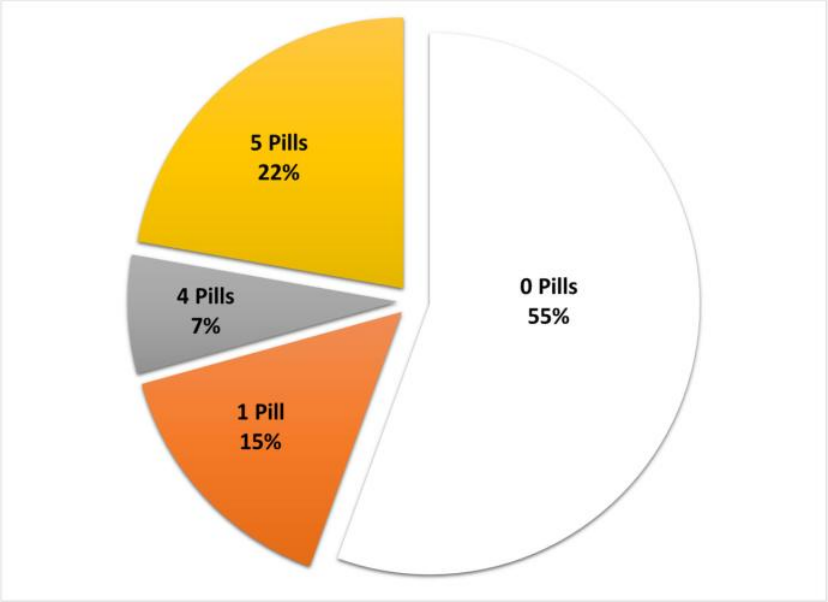


Figure 1: Number of oxycodone pills used at home for breakthrough pain in the post-operative period.

Paper #8
January 16, 2019
3:05 pm

AN INFECTIOUS PULMONARY INSULT POST-TBI WORSENS SUBSEQUENT SPATIAL LEARNING AND NEUROLOGICAL OUTCOMES

Christina Jacovides, MD*, Syed Ahmed, MD, Yujin Suto, MD, PhD, Andrew Paris, MD, Ryan Leone, Jordan McCarry, Melpo Christofidou-Solomidou, PhD, Lewis J. Kaplan, MD, FACS, FCCM, FCCP*, Douglas Smith, MD, Daniel N. Holena, MD, MSCE*, C. William Schwab, MD*, Jose L. Pascual, MD, PhD, FRCS(C), FACS, FCCM*
University of Pennsylvania

Presenter: Christina Jacovides, MD

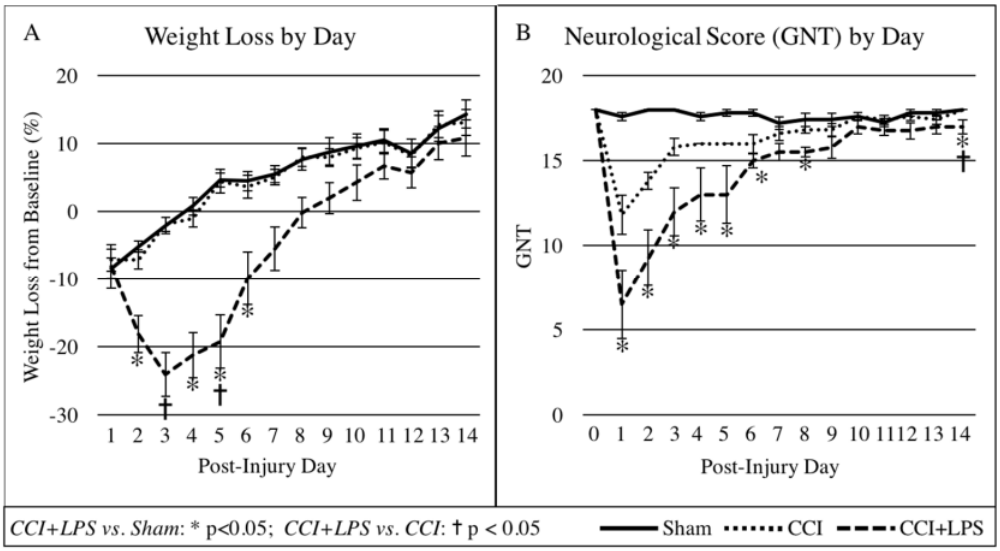
Discussant: Matthew E. Lissauer, MD, Rutgers-Robert Wood Johnson Medical School

Objectives: Severe traumatic brain injury (TBI) patients are at high risk for early aspiration and pneumonia. How pneumonia impacts neurological recovery after TBI is not clearly delineated. We hypothesized that, independent of the cerebral injury, pneumonia after TBI delays and worsens neurological recovery and cognitive outcomes.

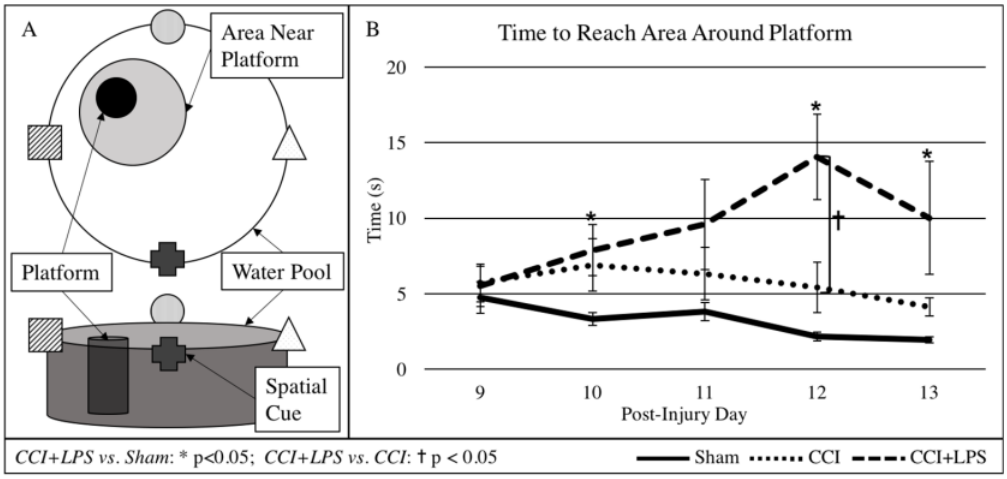
Methods: Seventeen CD1 male mice were randomized to sham craniotomy or severe TBI (controlled cortical impact (CCI) - velocity 6m/s, depth 1.0mm) +/- intratracheal instillation of lipopolysaccharide (LPS-2mg/kg in 0.1ml saline) as a pneumonia bioeffector. Neurological function by Garcia Neurologic Test (GNT) and body weight loss were recorded daily for 14 days. On days 6-14, animals underwent Morris Water Maze (MWM) learning and memory testing with cued trials (platform visible), spatial learning trials (platform invisible, spatial cues present), and probe (memory) trials (platform removed, spatial clues present). Intergroup differences were determined using Kruskal-Wallis test with Bonferroni correction ($p<0.05$).

Results: CCI+LPS mortality was 43% (3/7) compared to 0% in Sham and CCI. Weight loss was greatest in the CCI+LPS group (maximum 24% on Day 3 vs. 8% [Sham], 7% [CCI], both on Day 1 - Fig1A). GNT was lowest in CCI+LPS during the first week (Fig1B). MWM testing demonstrated greater spatial learning impairment in the CCI+LPS group vs. Sham or CCI groups (Fig2B). Cued learning and long-term memory were worse in CCI+LPS and CCI compared to Sham.

Conclusions: A pneumonia bioeffector insult after TBI worsens neurological outcomes in a rodent model. Not only is spatial learning impaired, but animals are more debilitated and have worse neurologic performance. Understanding the adverse effects of pneumonia on TBI recovery is the first step in optimizing pulmonary care for brain-injured patients.



Body weight loss and neurological score were significantly worse in CCI+LPS animals for up to one-week post-injury.



Spatial cues guide animals to a hidden underwater platform. CCI+LPS animals take longer to reach the area around the platform than both CCI and Sham animals.

Paper #9
January 16, 2019
3:25 pm

PREPERITONEAL BALLOON TAMPONADE AND RESUSCITATIVE BALLOON OCCLUSION OF THE AORTA: ALTERNATIVES TO OPEN PACKING FOR PELVIC FRACTURE-ASSOCIATED HEMORRHAGE

Woo S. Do, MD, Dominic M. Forte, MD, Rowan R. Sheldon, MD, Jessica B. Weiss, MD, Morgan R. Barron, MD, Kyle K. Sokol, MD, George E. Black, MD, Sara R. Hegge, DVM, MPH, Matthew J. Eckert, MD*, Matthew J. Martin, MD, FACS*
Madigan Army Medical Center

Presenter: Woo S. Do, MD

Discussant: Ronald B. Tesoriero, MD, R Adams Cowley Shock Trauma

Objectives: To compare the efficacy of preperitoneal balloon tamponade (PPB) and resuscitative endovascular balloon occlusion of the aorta (REBOA) against open preperitoneal packing (OP) in a realistic animal model of pelvic fracture-associated hemorrhage.

Methods: 39 swine underwent creation of open-book pelvic fracture and iliac vascular injury. Animals were randomized to no intervention (n=7), OP (n=10), PPB (n=9), zone 1 REBOA (n=7), and zone 3 REBOA (n=6) at a MAP<40mmHg from uncontrolled hemorrhage. Hemodynamics, lab values, survival time (up to 1h), peak preperitoneal pressure (PPP), and blood loss were compared. In a subset of animals, the intervention was taken down or removed to assess post-intervention survival.

Results: Prior to injury, no difference was measured between groups for weight, hemodynamics, lactate, and hematocrit (all p=NS). The injury was uniformly lethal without intervention, with survival time (mean) of 5m, PPP of 14mmHg, blood loss of 960g, bleed rate of 450g/min, and peak lactate of 2.6mmol/L. Survival time (m) was extended to 44 with OP, 60 with PPB, and 60 with REBOA ($p<0.01$). PPP (mmHg) was 19 with OP, 23 with PPB, 10 with zone 1 REBOA, and 6 with zone 3 REBOA ($p<0.05$). Blood loss (g) was 850 with OP, 930 with PPB, 610 with zone 1 REBOA, and 370 with zone 3 REBOA ($p<0.01$). Peak lactate (mmol/L) was 3.3 with OP, 4.3 with PPB, 13.4 with zone 1 REBOA, and 5.3 with zone 3 REBOA ($p<0.01$). Only 33% of zone 1 REBOA animals survived the initial 10m after balloon deflation, compared to 60% for OP, 67% for PPB, and 100% for zone 3 REBOA ($p<0.01$).

Conclusions: PPB and zone 3 REBOA are rapid and more effective alternatives to OP for early control of lethal pelvic fracture-associated hemorrhage and can be performed outside of the operating room. Zone 1 REBOA offers extended survival time but with fatal ischemia-reperfusion when deflated.

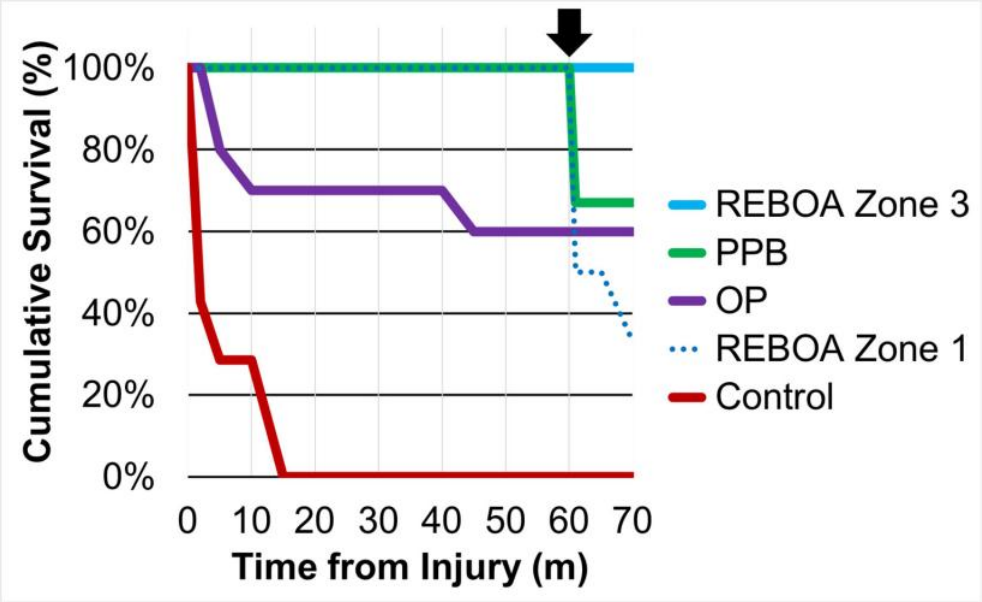


Figure 1: Comparison of cumulative survival (up to 60 minutes) by intervention arm. Black arrow = reversal of intervention. OP = open packing. PPB = preperitoneal balloon. REBOA = resuscitative balloon occlusion of the aorta.

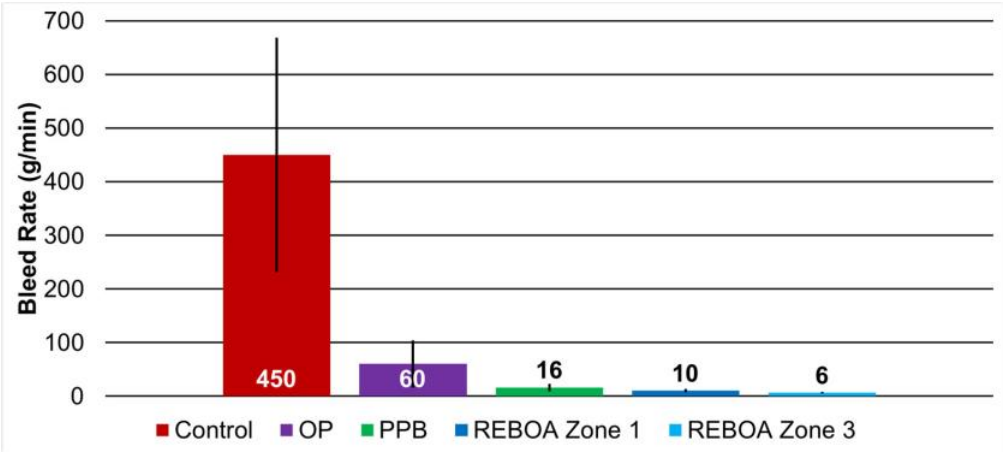


Figure 2: Comparison of bleed rate (mean) by intervention arm. Error bars represent 95% confidence intervals. OP = open packing. PPB = preperitoneal balloon. REBOA = resuscitative balloon occlusion of the aorta.

Paper #10
January 16, 2019
3:45 pm

FUNCTIONAL RECOVERY AND POSTTRAUMATIC STRESS DISORDER AFTER INJURY: EDUCATION IS AN IMPORTANT PREDICTOR

Juan P. Herrera-Escobar, MD, Rachel Rivero, BS, Syeda Al Rafai, MD,
Jonathan Scott, MD, MPH, Michel Apoj, BS, George Velmahos, MD, PhD, MSEd,
Ali Salim, MD*, George Kasotakis, MD, MPH*,
Adil H. Haider, MD, MPH*, Deepika Nehra, MD,
Brigham and Women's Hospital

Presenter: Juan P. Herrera-Escobar, MD

Discussant: Joseph V. Sakran, MD, MPH, MPA, Johns Hopkins University

Objectives: Lower socioeconomic status is known to be associated with higher morbidity and mortality following injury. However, the impact of individual socioeconomic measures on long-term outcomes after trauma is unknown. The objective of the current study is to determine the impact of individual socioeconomic measures on long-term physical and mental health outcomes after traumatic injury

Methods: Trauma patients with moderate to severe injuries, admitted to three Level-I trauma centers were contacted between 6- and 12-months post-injury to evaluate: functional status, return to work, and Post-Traumatic Stress Disorder (PTSD). Socioeconomic status was determined by educational level and income. Low educational level was defined as high school education or lower and low income as living in a zip code area where the median income per household was lower than the national median ($57,617). Adjusted logistic regression models were built to determine the association between educational level and income on each of the long-term outcomes

Results: A total of 1,022 patients were followed during a two-year period. 50% had a low educational level and 31% were categorized in the low-income group. Mean age and injury severity score were 58 (SD: 21.9) and 14.5 (SD: 7.4) respectively, with most patients (94%) suffering blunt injuries. After adjusting for potential confounders, low educational level, but not low-income level, was associated with poor long-term outcomes (Table)

Conclusions: Low educational level is strongly associated with worse long-term outcomes after traumatic injury whereas a household income below the national median is not. The impact of different socioeconomic measures on long-term outcomes after trauma cannot be assumed to be interchangeable

Outcomes	Low vs. high education	Low educational level adjusted OR [95% CI]	Low vs. high income	Low income adjusted OR [95% CI]
Functional limitation	**44% vs. 27%***	**2.32 [1.73-3.10] ***	37% vs. 35%	1.09 [0.79-1.50]
Return to work	**57% vs. 29%***	**4.33 [2.74-6.85] ***	**50% vs. 39%***	1.54 [0.97-2.44]
PTSD	**35% vs. 14%***	**2.72 [1.86-3.98] ***	**32% vs. 19%***	1.24 [0.83-1.84]

*Significant result ($p<0.05$)

Adjusted for age, sex, ISS, injury type, ventilator use, intensive care unit use, head injuries, extremities injuries, length of stay, and site.

Paper #11
January 16, 2019
4:05 pm

EARLY INSULIN THERAPY ABROGATES STRESS ASSOCIATED HYPERGLYCEMIA EFFECTS ON THE GLYCOCALYX-ENDOTHELIAL VASCULAR BARRIER

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Wayne State University

Presenter: Jonathan Martin, MD

Discussant: Alicia M. Mohr, MD, University of Florida

Objectives: Early hyperglycemia is associated with increased morbidity and mortality in critically injured patients and insulin therapy to achieve euglycemic conditions may improve outcomes. The mechanisms are uncertain. Both hemorrhagic shock (HS) and hyperglycemia cause endothelial glycocalyx (EG) and endothelial cellular (EC) damage which contribute to impaired tissue perfusion and organ failure. We hypothesized that early Insulin (Ins) therapy would mitigate the adverse effects of stress related hyperglycemia on EG and EC injury. This was studied using a microfluidic device in a biomimetic *in vitro* model.

Methods: Human umbilical vein endothelial cell (HUVEC) monolayers were perfused at a constant shear rate in the microchannels of a microfluidic device well plate. Cells in the experimental group were exposed to hypoxia/reoxygenation and epinephrine to mimic HS followed by the addition of glucose at 80 or 200 mg/dl. Insulin was then added at 0- 60 minutes later. EG shedding was indexed by hyaluronic acid (HA) and syndecan-1 (syn-1) and EC injury by soluble thrombomodulin (sTM) and angiopoietin-1 and -2 concentrations in the perfusate. HUVEC intracellular reactive oxygen species (ROS) and inducible nitric oxide synthase (iNOS) production were measured by fluorescence. Statistical significance was inferred at $P < 0.05$. All data are expressed as mean ± SD.

Results: See Figure 1. Biomarkers of EG shedding and EC injury were decreased following Ins administration in the Glu-200 groups.

Conclusions: Our *in vitro* model of the microcirculation demonstrated that acute hyperglycemia exacerbated HS related EG and EC injury. These effects were blunted by early insulin administration. The mechanism appears to involve a reduction in ROS production and iNOS activation. Our study supports early insulin therapy in severely injured patients with stress related hyperglycemia.

	HLA (ng/mL)	Syn-1 (ng/mL)	sTM (pg/mL)	Ang 2/1	ROS (Fluorescence Intensity)	iNOS (Fluorescence Intensity)
HUVEC + Glu-80	13.6±1.4	23.3±2.9	26.2±2.5	0.31±0.1	69.6±11.0	31.3±7.3
HUVEC + Glu-200	44.2±3.9*	32.5±4.4*	47.4±2.8*	0.76±0.1*	92.1±19.2	43.6±9.1
HUVEC + Epi + H/R + Glu-80	89.3±5.8*	99.9±5.8*	105.1±9.1*	2.24±0.2*	131.8±16.8*	78.1±10.5*
HUVEC + Epi + H/R + Glu-200	152.6±7.8*	133.2±6.3*	156.8±8.2*	2.74±0.3*	160.9±17.6*	92.0±12.8*
HUVEC + Epi + H/R + Glu-200 + insulin time 0	131.3±6.4*#	110.8±5.5*#	129.9±8.1*#	1.38±0.1*#	107.9±15.5*#	64.6±5.2*#

N = 5 for each group; ***p< 0.05** vs. HUVEC + Glu-80; **#p<0.05** vs. HUVEC + Epi + H/R + Glu-200

Paper #12
January 17, 2019
10:15 am

BETTER UNDERSTANDING THE UTILIZATION OF DAMAGE CONTROL LAPAROTOMY: A MULTI-INSTITUTIONAL QUALITY IMPROVEMENT PROJECT

John A. Harvin, MD*, John P. Sharpe, MD, MS, Martin A. Croce, MD*, Michael Goodman, MD*, Timothy A. Pritts, MD, PhD*, Elizabeth Dauer, MD*, Benjamin Moran, MD*, Rachel Rodriguez, MD*, Ben L. Zarzaur, MD, MPH, FACS*, Laura Kreiner, MD*, Jeffrey A. Claridge, MD, MS, FACS*, John B. Holcomb, MD*
University of Texas Health Science Center

Presenter: John A. Harvin, MD

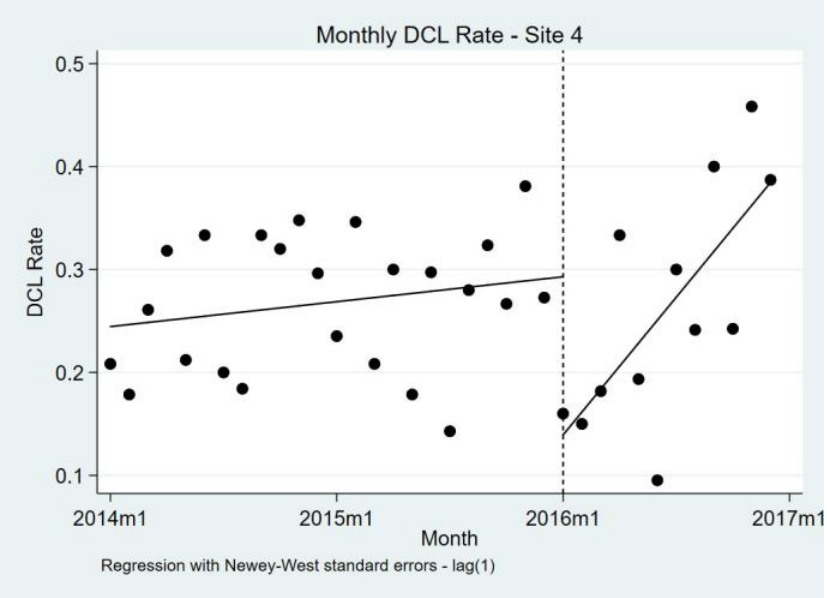
Discussant: Bryce R.H. Robinson, MD, MS, Harborview Medical Center

Objectives: Rates of damage control laparotomy (DCL) vary widely and consensus on appropriate indications does not exist. The purposes of this multi-center quality improvement (QI) project were to safely decrease the use of DCL, to identify the ideal rate of DCL at each institution, and to identify indications where consensus exists.

Methods: In 2016, six US Level 1 trauma centers performed a year-long, prospective QI project utilizing a single QI tool: audit and feedback. Each emergent trauma laparotomy was prospectively reviewed. DCL cases were adjudicated based upon majority vote of faculty members as being appropriate or potentially safe for definitive laparotomy. The rate of DCL for 2014-2015 was retrospectively collected and used as a control. To account for secular trends of DCL, interrupted time series was used to measure the effectiveness of the QI intervention. Ideal DCL rate was calculated using only DCLs voted appropriate by majority vote.

Results: During 2016, 872 emergent laparotomies were performed: 639 (73%) definitive laparotomies, 209 (24%) DCLs, and 24 (3%) intraoperative deaths. One center (Site 4) had a significant initial reduction in the rate of DCL, but this reduction did not last the duration of the study period (Figure). The other centers had no significant change in the rate of DCL (Table). Common indications for which consensus existed were packing (103/115 [90%] appropriate) and hemodynamic instability (33/40 [83%] appropriate). The only common indication for which consensus lacked was second look (16/32 [50%] appropriate).

Conclusions: A single faceted QI intervention failed to decrease the rate of DCL at six US Level 1 trauma centers. However, opportunities for improvement in safely decreasing the rate of DCL were present. Second look laparotomy appears to lack consensus as an indication for DCL and may represent a target to achieve an ideal rate of DCL.



Monthly rates of damage control laparotomy (DCL) from 2014-2016. The quality improvement intervention began January 1, 2016. While there was an initial drop in the use of DCL, this was not sustained for the duration of the year.

Site	Pre QI DCL Rate	QI DCL Rate	p value		Ideal DCL Rate	Difference between Actual and Ideal
1	37%	34%	0.305		27%	7%
2	23%	20%	0.771		16%	4%
3	27%	25%	0.822		18%	8%
4	27%	27%	<0.001		21%	6%
5	12%	19%	0.848		15%	4%
6	21%	16%	0.886		13%	3%

Paper #13
January 17, 2019
10:35 am

A SINGLE-CENTER PROSPECTIVE RANDOMIZED STUDY COMPARING THE EFFECTIVENESS OF 14 FRENCH PERCUTANEOUS CATHETERS(PIGTAIL) VERSUS 28-36 FRENCH CHEST TUBE IN THE MANAGEMENT OF TRAUMATIC HEMOTHORAX/HEMOPNEUMOTHORAX

Zachary M. Bauman, DO, MHA*, Narong Kulvatunyou, MD*, Lynn Gries, MD, Randall S. Friese, MD*, Bellal Joseph, MD*, Terence O'Keeffe, MD, MSPH*, Andrew L. Tang, MD*, Peter Rhee, MD, MPH, FACS, FCCM*
The University of Arizona

Presenter: Zachary M. Bauman, DO, MHA

Discussant: Mark J. Seamon, MD, Hospital of the University of Pennsylvania

Objectives: The traditional treatment of traumatic hemothorax/hemopneumothorax (HTX/HPTX) has been the insertion of a large-bore 32-40 French(F)chest tube(CT). In our retrospective study, 14F percutaneous catheter (PC)(pigtail) has been shown to be equally effective. In this randomized study, we hypothesized that PCs worked as equally well as CTs in the management of patients with traumatic HTX/HPTX(NCT02553434)

Methods: We performed a prospective randomized study comparing 14F PCs to 28-36F CTs in the management of patients with traumatic HTX/HPTX. We excluded patients that required emergent placement and who refused to participate. The PCs were placed at bedside by the trauma team using a modified Seldinger technique. The primary outcomes were initial output(IO) and failure rate. Secondary outcomes included tube days, intensive care unit and hospital length of stay, and insertion perception experience (IPE)score. Failure rate was defined as a retained HTX or a recurrent PTX requiring a second intervention. IPE score was an ordinal scale from 1-5,1 was a tolerable experience and 5 was the worst experience. For statistical analysis, we used the unpaired Student *t* test,χ^2 test, and the Wilcoxon rank-sum test; we defined significance by $P<0.05$.

Results: After exclusion, 43 patients were enrolled. The baseline characteristics between the two groups were similar. Outcomes are summarized(table)and there were no significant difference in primary and secondary outcomes except IPE in which PC patients rated their experiences as more tolerable.

Conclusions: In patients with traumatic HTX/HPTX, we found that 14F PCs were as equally effective as the traditional 28-36F CTs, but PC patients rated their tube IPE as more tolerable. A future larger multi-center randomized study is needed to confirm these preliminary findings.

	Pigtail Catheter (n = 20)	Chest Tube (n = 23)	*P*
Age (years), mean ± SD	62 ± 13	55 ± 18	0.16
Gender (male), %	85	96	0.23
Blunt trauma, %	95	74	0.06
Chest AIS, median (IQR)	3.5 (3, 4)	4 (3, 4)	0.89
ISS, mean ± SD	17.5 ± 6.6	15.8 ± 5.9	0.40
No. of rib fractures, median (IQR)	5 (2,5, 7)	4 (1, 6)	0.50
Flail, %	9	0	0.18
Day (from injury) tube inserted, median (IQR)	2.5 (1, 5)	1 (1, 2)	0.18
Initial output (ml), median (IQR)	**650 (375, 1087)**	**400 (240, 700)**	**0.06**
Failure rate, %	**10**	**17**	**0.49**
Tube days, median (IQR)	4 (3, 5.5)	4 (2, 7)	0.79
Insertion perception experience (IPE) score, median (IQR)	**1 (1, 2)**	**3 (3, 4)**	**0.001**
VATS, %	5	9	0.64
Ventilator day, median (IQR)	0 (0, 0.5)	0 (0, 0)	0.30
ICU day, median (IQR)	0 (0, 3.5)	0 (0, 3)	0.86
Hospital length of stay, median (IQR)	6.5 (4.5, 10)	7 (3, 9)	0.54
f			

Table

Paper #14
January 17, 2019
10:55 am

PREDICTORS OF POST-TRAUMATIC RETAINED HEMOTHORAX: RESULTS OF AN EAST MULTI-INSTITUTIONAL TRIAL

Sarah A. Moore, MD*, Priya S. Prakash, MD*, Sarah A. Moore, MD*,
Joao B. Rezende-Neto, MD, PhD, FACS*, Sandy Trpcic, Julie A. Dunn, MS, MD*, Brittany Smoot,
Donald H. Jenkins, MD, FACS*, Tatiana Cardenas, MD, Kaushik Mukherjee, MD, MSCI*,
Xian Luo-Owen, PhD, Jeffrey Wild, MD*, Katelyn Young, BS, Thomas J. Schroeppel, MD*,
Raul Coimbra, MD, PhD, FACS, Jeanne Lee, MD, FACS, David J. Skarupa, MD, FACS*,
Michel Sabra, MD, Matthew M. Carrick, MD*, Barbara Shaffer, Forrest O. Moore, MD, FACS*,
Jeanette Ward, MS-CR, Thomas Geng, DO, FACS, David Lapham, DO, Alice Piccinini, MD, Kenji Inaba, MD,
Christopher Dodgion, MD, MSPH, MBA*, Tim Schwartz, DO*, Kelly Lightwine, MPH, Jennifer Burris, MD,
Vaidehi Agrawal, PhD, Mark J. Seamon, MD, FACS*, Jeremy W. Cannon, MD, SM, FACS*
University of Pennsylvania

Presenter: Sarah A. Moore, MD

Discussant: Narong Kulvatunyou, MD, University of Arizona

Objectives: The natural history of traumatic hemothorax (HTX) remains unclear, and the effect of both patient characteristics and interventions has not been fully characterized. The aim of this study was to describe the outcomes of HTX following both blunt and penetrating injury and to delineate factors that predict progression to a retained hemothorax (RH). We hypothesize that an initial large volume HTX predicts the development of RH.

Methods: We conducted a prospective, observational multi-institutional study of adult trauma patients diagnosed with a HTX of any size. HTX volumes were calculated by computed tomography (CT) using Mergo's formula (Figure). RH was defined as blood-density fluid identified on follow-up CT any time after initial diagnosis or any HTX requiring secondary intervention.

Results: 17 trauma centers contributed 985 patients with 1033 hemothoraces. 271 (26.2%) patients developed RH. On univariate analysis, patients who developed RH were more likely be male, to have a penetrating injury, pulmonary contusion, and HTX seen on initial chest x-ray. Patients who progressed to RH presented with higher initial heart rate, creatinine, INR and lactate, and lower hematocrit. The average chest Abbreviated Injury Score (AIS) was higher in patients with RH, and the volume of the initial HTX as measured on CT was larger. Initial tube thoracostomy size was not significantly different among patients who developed RH. After controlling for significant differences between groups, independent predictors of RH included lower presenting hematocrit, higher chest AIS, and larger initial HTX volume on CT (Table).

Conclusions: Retained hemothorax occurs commonly after chest trauma and is independently associated with anemia, severe chest injury, and larger initial HTX volume. The role of early re-imaging and early surgical intervention should be evaluated in patients with multiple risk factors for RH.

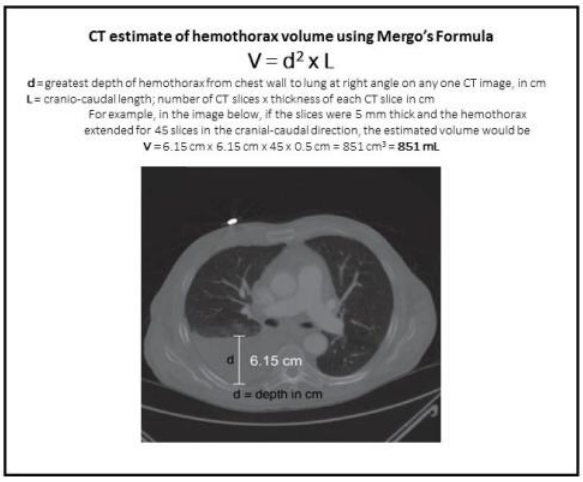


Figure. CT Estimate of Hemothorax Volume Using Mergo's Formula

	Odds Ratio (95% Confidence Interval)	*p* value
Gender	0.54 (0.28-1.03)	0.06
Penetrating Mechanism	0.99 (0.53-1.86)	0.98
Pulmonary Contusion	0.99 (0.59-1.68)	0.98
Visible on Initial CXR	1.32 (0.78-2.23)	0.31
Heart Rate (bpm)	1.00 (0.99-1.01)	0.98
Decreasing Hematocrit (%)	1.05 (1.01-1.05)	0.03*
INR	0.83 (0.49-1.43)	0.51
Lactate (mmol/L)	0.96 (0.86-1.07)	0.45
Chest AIS	1.43 (1.03-1.99)	0.03*
Volume on CT (per 100 mL)	1.08 (1.01-1.16)	0.04*

Table. Multivariate Analysis of Risk Factors for Retained Hemothorax.

Paper #15
January 17, 2019
11:15 am

ANTICOAGULATION THERAPY IN PATIENTS WITH TRAUMATIC BRAIN INJURY (ACT-TBI): AN EAST MULTICENTER PROSPECTIVE STUDY

Kazuhide Matsushima, MD*, Stefan W. Leichtle, MD, FACS*, Jeffrey Wild, MD*, Katelyn Young, BS, Grace Chang, MD*, Cara Diaz Lomangino, ACNP, Jeniffer Massetti, ACNP, Nina Glass, MD*, David H. Livingston, MD*, Karen O'Bosky, MD, Julie Chan, MD, PhD, Daniel C. Cullinane, MD*, Kelly A. Rippey, MD*, Jyoti Sharma, MD, Jeffry Nahmias, MD, MHPE, FACS*, Areg Grigorian, MD, Steven Allen, MD*, Scott B. Armen, MD, FACS, FCCM*, John D. Berne, MD*, Dalier Mederos, MD, Jose L. Pascual, MD, PhD, FRCS(C), FACS, FCCM*, Shelby Resnick, MD*, Omar Bholat, MD, COL, MC, USAR*, Lauren Ostry, MD, Luis J. Garcia, MD*, Rafael Ramos Vecchio, MD, Eleanor S. Winston, MD*, Andrew F Sabour, BS, Demetrios Demetriades, MD, PhD, FACS
LAC+USC Medical Center

Presenter: Kazuhide Matsushima, MD

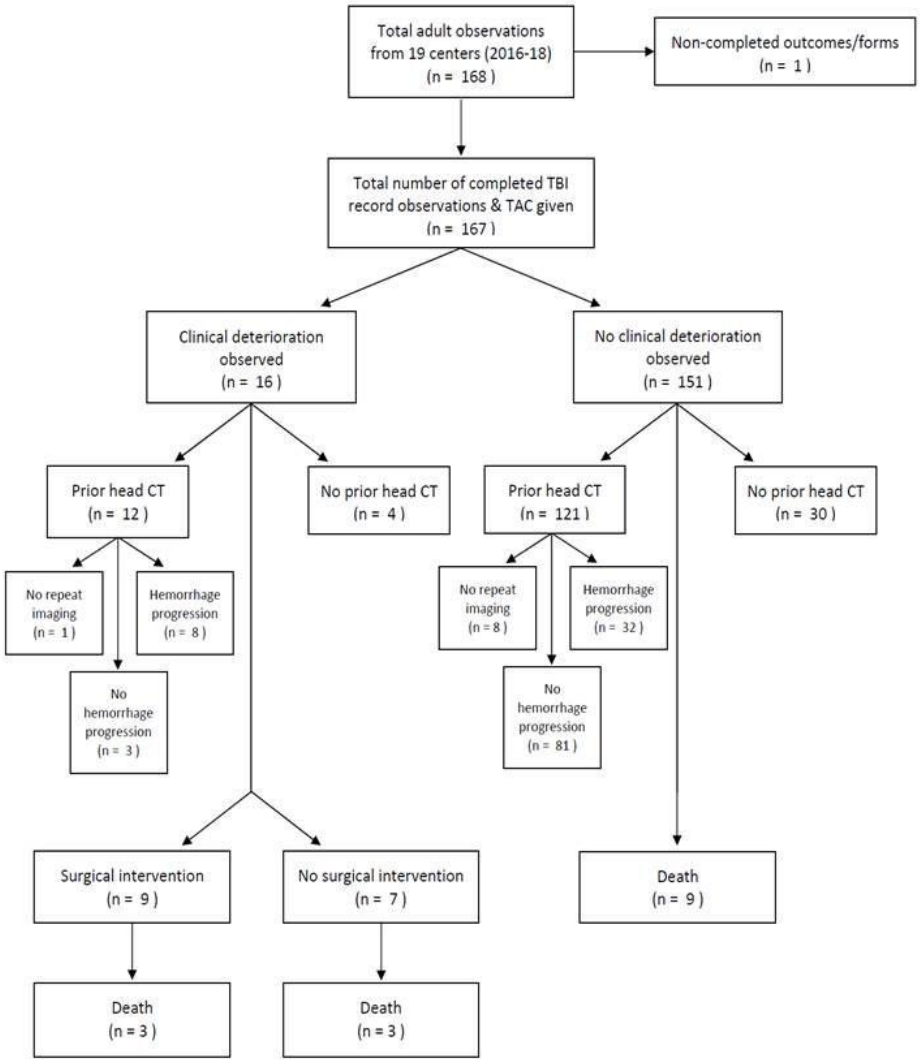
Discussant: Bellal Joseph, MD, University of Arizona

Objectives: Trauma care providers often face a dilemma between the risks of bleeding on anticoagulation therapy (ACT) versus thromboembolic events in patients with traumatic brain injury (TBI). The aims of this study were 1) to describe the current practice of ACT in patients with TBI and their outcomes, and 2) identify factors significantly associated with the progression of TBI following ACT.

Methods: This is a multicenter prospective observational study sponsored by the EAST. We included CT-proven TBI patients (age =18 years) who received ACT within 30 days after hospital admission. Our primary outcome was the incidence of clinically significant progression of TBI (decrease in Glasgow Coma Scale <2, required higher level of care, or neurosurgical interventions) on ACT. Logistic regression analysis was performed to identify factors significantly associated with clinical deterioration following ACT.

Results: A total of 168 patients from 19 centers were enrolled over 22 months. Atrial fibrillation and venous thromboembolism were the most common pre- and post-injury indications for ACT, respectively. Overall, 16 patients (9.6%) experienced clinical significant progression of TBI after ACT and 9 (5.4%) patients subsequently required neurosurgical interventions. ACT was initiated significantly earlier for patients with clinical pregression (4.5 days vs. 11 days, p=0.015). In a multiple logistic regression model, fewer days to ACT was significantly associated with clinically significant TBI progression (OR: 1.087 each day, 95% CI: 1.005-1.173, p=0.037)

Conclusions: This study showed that clinically significant progression of TBI was observed in approximately 10% of study population. While our results suggest that early ACT is associated with higher risk of TBI progression, balance between bleeding and thromboembolic risks should be carefully evaluated in each case before initiating ACT.



Patient flow diagram

Paper #16
January 17, 2019
11:35 am

SAFETY PROFILE AND IMPACT OF LOW-TITER GROUP O WHOLE BLOOD FOR EMERGENCY USE IN TRAUMA

James Williams, BS, Nicholas Merutka, BS, David Meyer, MD, MS*,
Yu Bai, MD, PhD, Samuel Prater, MD, Charles E. Wade, PhD,
Joseph D. Love, DO, FACS*, Bryan A. Cotton, MD, MPH
University of Texas Health Science Center at Houston

Presenter: James Williams, BS

Discussant: Lucy Z. Kornblith, MD, University of California San Francisco

Objectives: Several US trauma centers have begun incorporating uncrossmatched, group O whole blood into civilian trauma resuscitation. We set out to evaluate the safety profile, transfusion reaction event rates, and impact of low-titer group O whole blood (LTO-WB) at our center.

Methods: In November 2017, we added cold-stored LTO-WB to each of our helicopters and our emergency department (ED) refrigerator, alongside that of existing RBCs and plasma. We collected information on all trauma patients receiving prehospital or ED transfusion of uncrossed, emergency release blood products between 11/01/17 and 05/31/18. Patients were divided into those who received any LTO-WB and those who only received RBC and or plasma (COMP). Serial hemolysis panels (potassium, creatinine, total bilirubin, LDH, and haptoglobin) and PaO2/FiO2 (P/F) ratios were obtained at 3-hrs, 24-hrs, and 48-hrs. Statistical analysis was performed using STATA 12.1, with statistical significance set at $p<0.05$.

Results: 161 patients received LTO-WB, 95 patients received COMP. There were no differences in age, sex, or mechanism. While ISS was similar (median 28 vs. 23; p=0.209), LTO-WB had higher chest AIS (3 vs. 2; p=0.027). LTO-WB had higher prehospital pulse (109 vs. 98; p=0.023) and lower blood pressure (110 vs. 129; p=0.058). LTO-WB patients presented with higher lactate (5.1 vs. 3.4; $p<0.001$). LTO-WB received less post-ED blood products (0 vs. 3; p=0.001). There was no difference in mortality (LTO-WB 26%, COMP 22%; p=0.373). There was one transfusion reaction in the COMP group (none in LTO-WB). There was no difference in hemolysis values at different time points, with the exception of improved bilirubin and P/F in the LTO-WB group (**TABLE**). Controlling for age, ISS, and prehospital physiology, LTO-WB was associated with a 80% reduction in post-ED transfusions (OR 0.19; 0.07-0.41).

Conclusions: LTO-WB appears to be a safe alternative to 1:1 component therapy in emergency release settings and is associated with a reduction in post-ED transfusions.

	LTO-WB patients (n=161)	COMP patients (n=95)	p-value
Median admission creatinine	1.2 (1.1, 1.5)	1.2 (0.9, 1.6)	0.609
Median ICU creatinine	1.1 (0.8, 1.5)	1.0 (0.8, 1.3)	0.102
Median 24-hr creatinine	0.9 (0.7, 1.3)	0.9 (0.7, 1.4)	0.541
Median 48-hr creatinine	0.8 (0.6, 1.2)	0.9 (0.7, 1.1)	0.398
Median admission K+	3.8 (3.3, 4.3)	3.7 (3.4, 4.3)	0.921
Median ICU K+	4.1 (3.7, 4.4)	4.2 (3.8, 4.5)	0.626
Median 24-hr K+	4.1 (3.8, 4.4)	4.1 (3.8, 4.5)	0.475
Median 48-hr K+	4.0 (3.6, 4.3)	4.1 (3.8, 4.5)	0.062
Median admission bilirubin	N/A	N/A	
Median ICU bilirubin	0.9 (0.6, 1.4)	1.0 (0.5, 2.1)	0.872
Median 24-hr bilirubin	0.6 (0.4, 1.0)	1.1. (0.7, 2.8)	0.010
Median 48-hr bilirubin	0.5 (0.4, 0.8)	1.1 (0.4, 3.0)	0.068
Median admission LDH	N/A	N/A	
Median ICU LDH	449 (276, 584)	274 (69,480)	0.263
Median 24-hr LDH	389 (263, 485)	532 (301, 581)	0.396
Median 48-hr LDH	356 (223, 518)	462 (339, 533)	0.544
Median admission haptogobin	N/A	N/A	
Median ICU haptogobin	60 (35, 103)	68 (42, 94)	0.871
Median 24-hr haptogobin	72 (30, 118)	81 (29, 134)	0.718
Median 48-hr haptogobin	118 (62, 165)	167 (73, 211)	0.478
Median admission P/F ratio	344 (230, 480)	393 (239, 532)	0.247
Median ICU P/F ratio	351 (230, 481)	401 (246, 532)	0.127
Median 24-hr P/F ratio	372 (312, 473)	333 (240, 422)	0.069
Median 48-hr P/F ratio	322 (247, 413)	277 (230, 358)	0.168

SERIAL HEMOLYSIS PANEL LAB VALUES AND P/F RATIOS

Paper #17
January 17, 2019
11:55 am

PROLONGED PRE-HOSPITAL TREATMENT WITH ADENOSINE, LIDOCAINE, AND MAGNESIUM HAS INFERIOR SURVIVAL COMPARED TO CURRENT TACTICAL COMBAT CASUALTY CARE RESUSCITATION IN A PORCINE MODEL OF HEMORRHAGIC SHOCK

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Naval Medical Research Unit San Antonio

Presenter: Remealle A. How, MD

Discussant: Matthew J. Eckert, MD, Madigan Army Medical Center

Objectives: ALM (adenosine+lidocaine+magnesium) is a cardioplegic agent shown to improve survival by improving cardiac function, tissue perfusion, and coagulopathy in animal models of shock. This study's objective was to determine if pre-hospital ALM treatment in hemorrhagic shock would improve survival compared to current Tactical Combat Casualty Care (TCCC) resuscitation beyond the Golden Hour.

Methods: Swine were randomized to: (1) TCCC, (2) vehicle control (VC), (3) 2cc/kg ALM+drip, (4) 4cc/kg ALM+drip, (5) 4cc/kg ALM+delayed drip. Animals underwent pressure-controlled hemorrhage to MAP of 30mmHg (T=0) at which time treatment was administered. After 120 minutes of simulated prehospital care (T=120) blood product resuscitation commenced. Physiologic variables were recorded and labs (chemistry, thromboelastography) were drawn at specified time points.

Results: TCCC demonstrated superior survival to all other agents (Figure1). VC and ALM groups had lower MAPs and SBPs compared to TCCC (Figure2). Except for VC, lactate levels remained similar with correction of base deficit after pre-hospital resuscitation in all groups. Compared to baseline values, TCCC demonstrated significant hypocoagulability (Figure3). Creatinine remained elevated for VC and all ALM groups.

Conclusions: ALM is inferior to current hextend-based resuscitation for survival from prolonged hemorrhagic shock in this model. In survivors, ALM groups had lower blood pressures and increasing creatinine levels but provided a protective effect on coagulopathy compared to TCCC. ALM does not appear to be a suitable low volume replacement to current TCCC standards. The reduced coagulopathy compared to TCCC warrants future studies of ALM, perhaps as an in-hospital therapeutic adjunct.

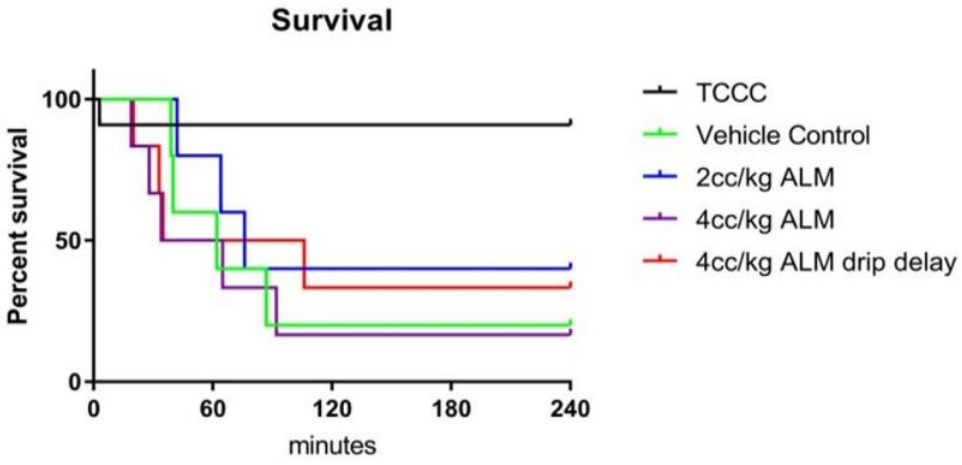

Figure 1

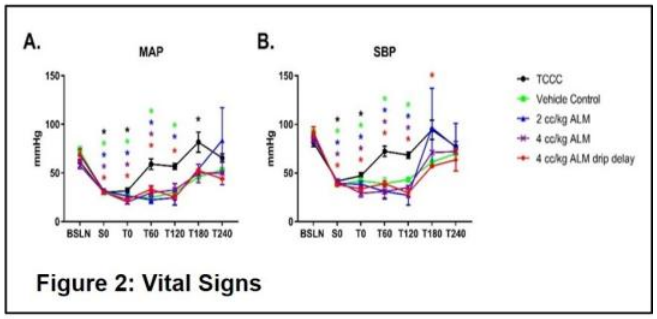

Figure 2: Vital Signs

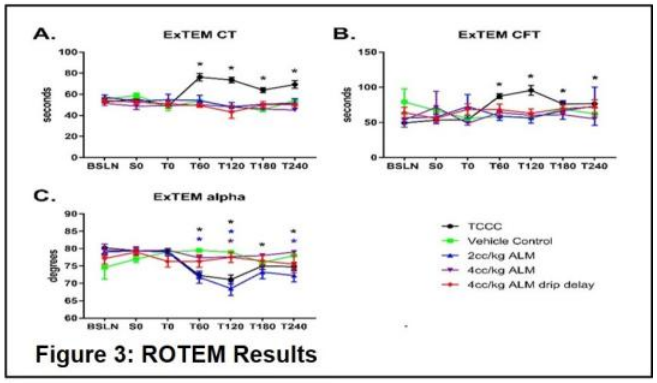

Figure 3: ROTEM Results

Scientific Session III-B Cox-Templeton Injury Prevention Paper Competition

Paper #18
January 17, 2019
10:15 am

USING THE TRAUMA REGISTRY TO GUIDE YOUR INJURY PREVENTION PROGRAMS

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Presenter: Christopher A. Missler, RN, BSN

Discussant: Sean Elwell, MSN, RN, NE-BC, TCRN, EMT
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Objectives: In 2016, we started receiving trauma patients and looking at data and we identified a problem related to diving injuries and high cervical fractures. A spinal cord injury can cost anywhere from $350,000 - $1.1 million for the first year alone depending on the severity and continued costs can range from $42,000- $200,000 in following years.

Methods: Using our 2016 registry data we identified high-risk areas and one cluster pattern. We found 2% of the total injuries were water related but had highest mortality of 16%. 28% were identified with high cervical fractures. 71% required ICU admission, 71% required operative intervention. 57% were discharged home and 43% went to rehab.

After the cluster was identified a “Think Before You Dive” mantra with posters, signage, and koozies were developed. A trifold with water safety tips; magnets with the diving message, rip current safety, and beach flag safety meanings were too. We collaborated with local businesses to display the signage and pass out pamphlets. Hotels and condos placed magnets in their rooms. One large time share company placed a hard stop in their registration process to acknowledge of these warnings.

Results: We compared the data for effectiveness and noted a 100% reduction in cervical spine injuries in the cluster area and reductions of: 24% in all water related incidents, 75% in morality, 60% in ICU admits, 60% in operative intervention, 60% in spinal cord injuries. The injuries noted came from areas not targeted by the program. Using the Economic Impact of SCI published in the *Journal Topics in Spinal Cord Injuries Rehabilitation*, the 2016 estimated cost was $3.4 million which decreased to $2.1 million in 2017.

Conclusions: Trauma registry data should be analyzed with ongoing frequency to aid in identifying opportunities to target injury prevention initiatives with the greatest impact. Pre and post analysis should be used to determine the effectiveness of the intervention.

Severity of Injury	Average Yearly Expenses (in 2015 dollars) First Year	Each Subsequent Year	Estimated Lifetime Costs by Age At Injury (discounted at 2%) 25 years old	50 years old
High Tetraplegia (C1–C4) AIS ABC	$1,065,980	$185,111	$4,729,788	$2,599,411
Low Tetraplegia (C5–C8) AIS ABC	$770,264	$113,557	$3,455,879	$2,125,674
Paraplegia AIS ABC	$519,520	$68,821	$2,312,846	$1,517,851
Motor Functional at Any Level AIS D	$347,896	$42,256	$1,580,148	$1,115,312

Data Source: Economic Impact of SCI published in the journal *Topics in Spinal Cord Injury Rehabilitation*, Volume 16, Number 4, in 2011.
ASIA Impairment Scale (AIS) is used to grade the severity of a person's neurological impairment following spinal cord injury.

Economic Impact of SCI published in the *Journal Topics in Spinal Cord Injuries Rehabilitation*

Example of signage on floating structure.

Paper #19
January 17, 2019
10:35 am

DETERMINING THE INCIDENCE OF DISTRACTION AMONG TRAUMA PATIENTS IN ALL MODES OF TRANSPORTATION

Brittany Le, BS, Cesar Figueroa, MD, Viktor Gabriel, MD, Craig Anderson, MPH, PhD, Shahram Lotfipour, MD, Wirachin Hoonpongsimanont, MD, MS, Cristobal Barrios, MD*
University of California, Irvine

Presenter: Brittany Le, BS

Discussant: Jamie J. Coleman, MD, Denver Health Medical Center/University of Colorado

Objectives: The use of distracting technology is an increasing source of risk for injury among trauma patients. Both drivers and pedestrians show increased unsafe behavior. The data for prevalence and risk for distraction in trauma has varied widely. Our hypothesis is that distraction is more highly prevalent and widely distributed among all mechanisms of injury and variety of trauma patients.

Methods: A 10 question survey of adult trauma victims at a Level I trauma center regarding distraction at time of event was performed, examining age, gender, ethnicity, education level, mode of injury and role in the accident (driver, passenger, pedestrian, bicyclist, motorcyclist). Logistic regression was performed to identify risk factors for distraction.

Results: From June 2016 to January 2018, 866 patients were surveyed, and 408 (47.1%) patients reported their role in the traffic accident. The prevalence of distraction was 20.7% among drivers, 11.6% among passengers, 20.9% among pedestrians, 32.4% among bicyclists, and 9.30% among motorcyclists. Only gender and level of education showed statistically significant differences. Male gender (OR=2.06; CI 1.16-3.65, p=0.013) and presence of advanced degree (OR=2.48; CI=1.00-6.12, p=0.049) increased risk for distraction. Motorcyclist role during collision (OR=0.32; CI=0.10-0.97; p=0.045) was a lowered risk of distraction. Furthermore, mechanical falls (OR=4.82; CI 0.86-26.91; p=0.073) and bicyclists (OR=3.01; CI 0.86-10.50; p=0.084) trended towards being at greater risk for distraction.

Conclusions: Distraction is prevalent among all victims of traffic accidents, not just drivers. Males and patients with advanced degrees are more likely to be distracted. In contrast, motorcyclists are less likely to be distracted. Further studies to assist in determining effective interventions and public safety efforts aimed at specific at-risk groups beyond motor vehicle drivers are warranted.

Paper #20
January 17, 2019
10:55 am

PREVENTING TEEN DISTRACTED DRIVING: A PROGRAM FROM INITIATION THROUGH TO EVALUATION

Peter Ehrlich, MD, MSc, H BSc*, Beth Costello, MS, Amy Randall, MSN, RN
University of Michigan

Presenter: Peter Ehrlich, MD, MSc, H BSc

Discussant: Shannon M. Foster, MD, Reading Trauma Center, Tower Health

Objectives: Distracted driving (DD) is a public health threat to the driver, passenger and others on the road. We initiated DD program where the objective was to attract parents to a website to download/order a parent tool box to reduce risk of DD. Traditional, digital media and focus groups were used to engage parents. We report the cost effectiveness of media strategy, program reach and usefulness of the tool box.

Methods: An evidence based interactive DD website was developed which provided a parent tool box (phone bag, contract, brochure). Two different digital media strategies were used. The first used all forms of traditional media platforms with no social media. The second used targeting, social media, ?calls to action" and seasonal pushes. Fifteen parent(P) and 15 teen (T) pair focus groups were used to assess usefulness of the website and tool box. Analytics, downloads/orders during each media strategy are reported as well the results of the parent /teen focus groups.

Results: There were 89,602 visits (> 2 minutes) to site. 54.5% were female and 45.5% were male. The tool box was downloaded/ordered from 10 different countries and 50 states. The first media campaign was Aug-15 to Feb-16 and the second between Mar-16 and Feb-17. Digital, targeted and social media(yr2) was more effective the general media(yr1). In yr2 website click through rate increased from 0.25% to 0.79%, time at website increased from 2.33 min to 5.29 min ($p > 0.05$), 500% more pages were viewed and downloads/orders increased from 15 to 37 month ($p > 0.05$). Mobile ads were more effective then desktop ads. The focus groups reported the: website was *"very useful"* in 9/15-P vs 10/15- T; the contract 10/15- P vs 6/15-T, bag 3/15-P and 4/15-T; and brochure 10/15-P vs 7/15 - T.

Conclusions: In this study targeted digital and social media combined with seasonal ads was effective in attracting parents to a website, holding their attention
and increased downloads/orders of a tool box.

Paper #21
January 17, 2019
11:15 am

FALL PREVENTION INITIATIVE: A FALL SCREENING PILOT STUDY IN THE AMBULATORY SETTING

Susan Kartiko, MD, PhD*, Elan Jeremitsky, MD*, Erin Jarosz, OTR/L, Ida Konderwicz, RN, BSN, CEN, Michael W. Cripps, MD, FACS*, Christian T. Minshall, MD, PhD*
Baystate Medical Center

Presenter: Susan Kartiko, MD, PhD

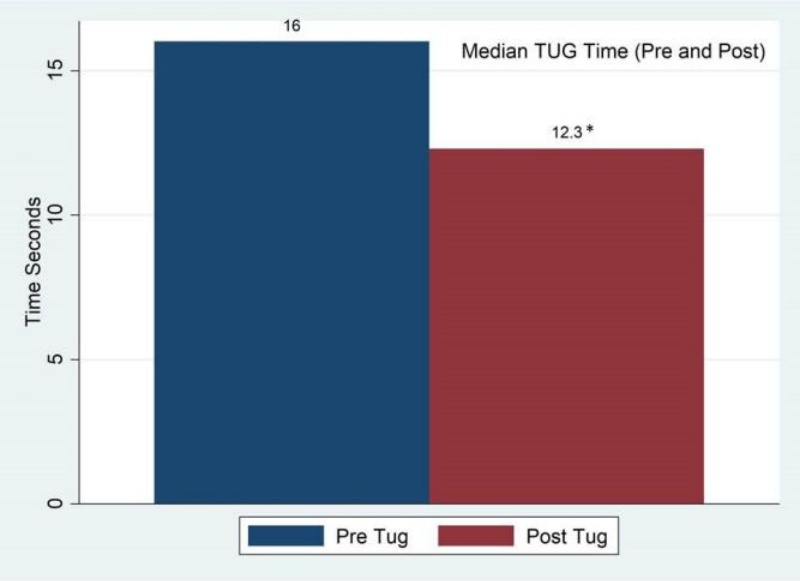
Discussant: Linda Ding, MD, University of South Alabama

Objectives: Falling is the most common cause of trauma in the geriatric population. To identify patients that were at-risk for falling, we implemented a provider-directed fall prevention screening initiative in the ambulatory setting of a large tertiary care referral center. The CDC created a 12-questions toolkit (STEADI) to identify patients that are at-risk for falling. The implementation of a 12 point fall screening questionnaire is cumbersome and time consuming. Instead, we used 3 provider-directed questions from the CDC?s STEADI toolkit. The purpose of the pilot is to determine if this screening initiative effectively identifies patients that are at risk for falling.

Methods: Patients = 55 yr who live in the community were screened using the 3 questions from 6/2017-6/2018. Patients who answered yes to any of the 3 questions were identified as at risk for falling and referred to the Fall Prevention Initiative Physical Therapy Program (FPIPTP). The FPIPTP is a program that establishes a quantifiable Fall Risk using the Time Up and Go test (TUG) which then initiates PT treatments designed to improve, gait, balance and core strength to prevent future falls. The Wilcoxon signed rank test was used to determine significance ($p<0.05$).

Results: We identified 60 patients with a median age of 77 yrs (IQR 67,83) using the provider-directed questions to be high risk for falling. The initial median TUG score in this group of patients is 16 sec (12.7, 21), which is consistent with a high fall-risk (time > 12 sec). After completing the FPIPTP, the median TUG score significantly improved to 12.3 sec (10, 16, $p<0.05$).

Conclusions: We conclude that a provider can use the 3 specific questions from the STEADI toolkit to effectively identify patients (=55 yr) that are at risk for falling. Additionally, the FPIPTP is able to significantly improve the TUG score in this group. We will need to confirm this conclusion with a larger population study.



The median TUG time before and after the Fall Prevention Initiative Physical Therapy Program

Paper #22
January 17, 2019
11:35 am

GOOGLE STREET VIEW ASSESSMENT OF ENVIRONMENTAL SAFETY FEATURES AT THE SCENE OF PEDESTRIAN INJURY

Patrick Isola, James N. Bogert, MD,Jordan A. Weinberg, MD*, Sharjeel Israr, MD, Kristina Chapple, PhD, Thomas Gillespie, MD
Creighton University School of Medicine - Phoenix Campus

Presenter: Patrick Isola

Discussant: Hee Soo Jung, MD, University of Wisconsin

Objectives: The number of pedestrian fatalities in the United States has grown substantially faster than all other traffic deaths. Structures designed to increase separation of pedestrians from motor vehicles include sidewalks, countdown signals, and refuge islands. Google Street View has been proposed as a tool for the assessment of pedestrian street safety. The purpose of this study was to use Google Street View to evaluate for the presence of pedestrian safety structures at the location of pedestrian-auto collisions.

Methods: Pedestrians struck by motor vehicles were identified from the registry of a level 1 trauma center in a large U.S. city from January 2013 to June 2018. Clinical and demographic data including geographic location of injury, age, gender, intoxication, injury severity score, and outcomes were collected. Each injury location was then assessed systematically with Google Street View. A composite pedestrian safety score was derived for each location according to the aggregate of six safety features (Figure 1). Patients were stratified by score (4 or less vs. 5 or more).

Results: 633 patients with known location of injury were identified. Average age was 41, 31% were female, and average ISS was 15. 53% were intoxicated. 406 patients were injured in locations with score of 4 or less and were more likely to have severe (ISS>25) injury (23% vs. 15%, p=0.017) and had higher mortality (14% vs. 8%, p=0.041). Patients injured in locations with score of 5 or more were significantly more likely to have been intoxicated (82% vs 37%, p<0.0001).

Conclusions: Pedestrian-friendly features as identified with Google Street View were associated with both lower injury severity and mortality. Nevertheless, the protective effect of these features require an alert and attentive pedestrian as evidenced by the significantly greater proportion of intoxicated patients injured in areas of relatively high safety.

Figure 1: Image from Google Street View demonstrating the six safety features evaluated. A: High-visibility crosswalk. B: Traffic signal. C: Refuge Island. D: Number of lanes. E: Countdown pedestrian signal. F: Sidewalk.

Paper #23
January 17, 2019
11:55 am

BICYCLE LANES: ARE WE RUNNING IN CIRCLES OR CYCLING IN THE RIGHT DIRECTION?

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Jessica Friedman, MD, Chrissy Guidry, MD*, Patrick McGrew, MD*,
Rebecca W. Schroll, MD*, Clifton McGinness, MD, Danielle Tatum, PhD,
Juan C. Duchesne, MD, FACS, FCCP, FCCM*
Tulane University School of Medicine

Presenter: Alison A. Smith, MD, PhD

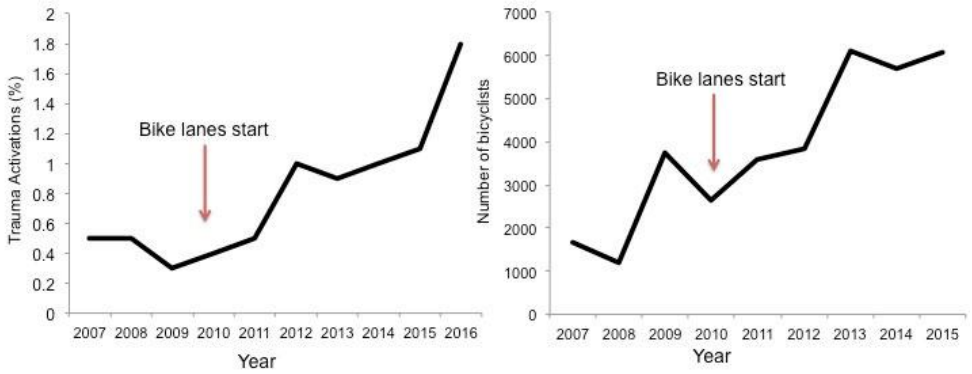
Discussant: Amy Stewart, MD, Advocate Lutheran General Hospital

Objectives: The number of urban bicyclists has grown exponentially across the United States. Bike lanes were created to promote a safe environment for both motorist and cyclists, but few studies have specifically addressed the outcomes of these interventions. The aim of this study was to analyze the effect of bike lanes on bicycle usage and safety in a major urban city.

Methods: A retrospective chart review of consecutive adult trauma patients presenting at an urban level 1 trauma center due to motor vehicle versus bicycle collisions from 1/1/07-1/28/17 was performed. Cohorts were stratified into pre- and post-bicycle lane implementation for analysis.

Results: Bicycle use during the study period increased almost three fold (1672 vs. 6060, $p<0.0001$). There was also a spike in the percent of yearly trauma activations for bicyclists (0.5% vs. 1.8%, $p<0.0001$). A total of 184 patients brought to the trauma center were identified. Significant differences in the pre-bike lane and post-bike lane groups for average ISS (12.7+1.7 vs 8.0+0.6 $p = 0.0134$), GCS on arrival (12.6+0.7 vs 13.9+0.2, $p = 0.0171$), proportion of head and face injuries (59.4% to 38.8%, $p = 0.047$), and patients requiring surgical intervention (100% to 55.9%, $p <0.0001$).

Conclusions: As bicycle lanes become increasing popular in US cities, it is important to review the success of this intervention on improving safety. Preliminary results from this study suggest that the implementation of urban bike lanes improved bicyclist safety. Further studies should focus on specific injury prevention programs, which could help to target areas such as helmet use and riding a bicycle while impaired to help improve overall safety.



The implementation of urban bicycle lanes in 2010 showed a statistically significant increase in the number of trauma activations due to bicycle related incidents and the number of cyclists also increased.

	Pre-Bike Lanes N=32	Post-Bike Lanes N=152	p value
Age, avg (SEM)	40.9±2.8	39.6±1.3	0.7
Male gender, n (%)	27 (84.3)	116 (76.3)	0.5
ISS, avg (SEM)	12.7±1.7	8.9+0.6	0.0134*
SBP on arrival, avg (SEM)	129.5±7.3	133.7±2.3	0.5
HR on arrival, HR (SEM)	93.6±3.7	87.5±1.9	0.2
GCS on arrival, avg (SEM)	12.6±0.7	13.9±0.2	0.0171*
Intoxicated, n (%)	15 (46.9)	74 (48.7)	1.0
Helmet, n (%)	0	8 (5.3)	0.4
Mortality, n (%)	1 (3.1)	3 (2.0)	0.5
Hospital LOS, avg (SEM)	9.4±2.5	5.9±0.8	0.1
ICU LOS, avg (SEM)	3.0±1.2	2.2±0.4	0.4

Study outcomes for the pre and post bike lane implementation in a major urban environment.

EAST Master Class Surgical Video Session

January 17, 2019
1:30 pm

THE BIGGER THEY ARE: VIDEO TIPS AND TECHNIQUES FOR MANAGING ACUTE CARE SURGERY EMERGENCIES IN THE POST-BARIATRIC SURGERY PATIENT

John P. Kuckelman, DO, Dominic M. Forte, MD,
Jason Bingham, MD, Matthew J. Martin, MD, FACS*
Madigan Army Medical Center

Presenter: Dominic M. Forte, MD

Background: Bariatric surgery is among the fastest growing procedures in the U.S. and worldwide. These patients may later develop a wide range of bariatric-specific complications, or common acute care surgery emergencies that are complicated by their bariatric anatomy. The majority of weight loss operations are completed in centers of excellence by bariatric focused surgeons. However, these severe complications or general surgery conditions may arise months to years later and are increasingly presenting for care at non-bariatric centers. It is increasingly common for the acute care surgeon to be called upon to evaluate and manage these problems, particularly when they require immediate surgical intervention. Thus, it is critical that modern acute care surgeons have an in-depth understanding of the anatomy of common bariatric operations, their unique complication profiles, and the optimal surgical techniques or procedures to effectively manage this patient cohort with optimal outcomes

Description: This presentation will focus on discussing several of the most common acute care surgical complications or common ACS problems in post-bariatric patients. We will provide a video series showcasing the preferred options and intraoperative techniques of high volume bariatric surgeons for common urgent or emergent post bariatric surgical complications. All videos will display successful management of the complication using relatively simple and straightforward laparoscopic or minimally invasive techniques and adjuncts. The anatomy and most common ACS problems for patients who have undergone a prior adjustable gastric band placement, roux-Y gastric bypass, and sleeve gastrectomy will be highlighted. Specific scenarios and videos of techniques will include: 1) a slipped or eroded adjustable gastric band, 2) a leak after sleeve gastrectomy, 3) internal hernias and perforated marginal ulcers after gastric bypass, and 4) management of choledocholithiasis in the patient with bariatric anatomy the precludes performance of an ERCP.

Conclusions: With the rapidly expanding field of bariatric surgery and increasing population of patients who have undergone a bariatric operation, all acute care surgeons must be prepared to evaluate and manage these patients. Complications and management decisions for emergent general surgical conditions arising after weight loss surgery are unique and often require immediate operative attention. These video scenarios demonstrate the anatomy and commonly encountered complications for the 3 most common bariatric procedures, and straightforward management and surgical approaches that can be utilized by the acute care surgeon.

January 17, 2019
1:42 pm

FROM IPOM TO TAR: COMPLEX MINIMALLY INVASIVE ABDOMINAL WALL RECONSTRUCTION IS IN THE ARMAMENTARIUM OF THE ACUTE CARE SURGEON

Andrea Pakula, MD
Kern Medical Center

Presenter: Andrea Pakula, MD

Background: Ventral hernia repairs are very common procedures and the modern acute care surgeon has to have expertise in a variety of repair techniques, including complex repairs using minimally invasive techniques (MIS). The application of robotic assisted surgery is rapidly being applied to a wide variety of general surgical cases, with ventral hernia representing the fastest growing application among general surgeons. We present two robotic assisted hernia repairs showing the progression from simple repair to a more complex reconstruction.

Description: We present two videos, the first is a robotic assisted laparoscopic ventral hernia repair with placement of intraperitoneal onlay mesh (IPOM) after primary defect closure in a patient with multiple hernia defects. The second is a robotic assisted laparoscopic complex incisional hernia repair requiring transversus abdominus myofascial release technique (TAR) with retro-rectus mesh placement and primary fascial closure in a patient with previous laparotomy.

Conclusions: The application and benefit from the enhanced 3- dimensional visualization and ergonomic benefits of robotic surgery, affords the benefits of minimally invasive surgery in cases that are often performed open. The use of robotic technology facilitated the successful repair of two hernias that acute care surgeons commonly evaluate for surgical management. The IPOM procedure was an outpatient case, and the TAR patient was discharged the day following surgery. There were no complications or recurrences at one year.

EAST Master Class Surgical Video Session

January 17, 2019
1:54 pm

SUCCESSFUL MANAGEMENT OF INJURIES TO THE PORTAL TRIAD

Kennith C. Coleman, MD, Daniel J. Grabo, MD, FACS*, James M. Bardes, MD*,
Kenji Inaba, MD, David C. Borgstrom, MD, FACS*,
Alison M. Wilson, MD, FACS*, Wallis Marsh, MD
West Virginia University

Presenter: Kennith C. Coleman, MD

Background: Although rare, injuries to the portal triad are known to be exceedingly complex, likely due to the multiple structures involved. In the most recent retrospective review of portal triad injuries, incidence over a 10-year period was only 0.08%. Overall mortality has been consistently reported around 50% with hemorrhage being the leading cause of death. Injury to the portal vein or hepatic artery resulted roughly equivalent mortality rates (60-70%) and had far worse outcomes than injury to the extrahepatic bile ducts (mortality ~ 30%.) Common complications seen were sepsis and wound infections. Patients with portal triad injuries often have additional severe concomitant injuries to the liver, pancreas, duodenum, and other intraabdominal organs. Hospital stay ranges from 13-40 days.

Most treatment guidelines for the management of portal triad injuries are derived from retrospective studies and case reports. For vascular injuries, survival rate varies greatly as to whether repair or ligation is chosen. Primary repair in a portal vein injury had a lower mortality rate than ligation (42% vs 90%) while the opposite was true for hepatic artery injuries (58% mortality for ligation vs 86% for primary repair).

Description: This video presentation will discuss key decisions, technical details and tips for success in the management of the patient with injuries to the portal triad. Each of the three key structures within the portal triad necessarily requires individual attention.

Techniques for primary repair and temporary shunt with delayed repair of the portal vein will be discussed and demonstrated with videos. In addition, the technique of damage control ligation, which is only used as a matter of last resort (mortality 90%) will be shown. Video demonstration for primary repair of injury to the hepatic artery will be shown, as will damage control ligation, which is well tolerated.

High quality video will be used to demonstrate primary repair and repair over a T-tube for MINOR injury to the common bile duct. Options for more complex injuries including temporary ligation, drainage, and interval reconstruction, often in the form of a Roux-en-Y hepatico-jejunostomy after a damage control operation, will also be shown.

Conclusions: Injury to the structures in the portal triad can be complex, especially due to other associated injuries. A knowledge of the surgical options for management of injury to structure is key to success.

EAST Master Class Surgical Video Session

January 17, 2019
2:06 pm

ULTRASOUND IN TRAUMA RESUSCITATION AND CRITICAL CARE WITH CONTINUOUS HEMODYNAMIC TRANS-ESOPHAGEAL ECHOCARDIOGRAPHIC GUIDANCE

Timothy Nowack MD, D. Benjamin Christie MD*
Mercer University School of Medicine, Navicent Health

Presenter: Timothy Nowack, MD

Background: Volume replacement strategies and resuscitation endpoints of therapy in the critical ill or injured patient continues to be a heavily debated topic despite decades of research and the ever-evolving technologies that provide for alternate methods of monitoring. Hemodynamic Transesophageal Echocardiography (hTEE), refined for the use in the Intensive Care Unit (ICU), allows for direct visualization of cardiac filling and function, enabling real-time guidance in the resuscitation of critically ill patients. The disposable, 17F hTEE probe can remain indwelling for up to 72 hours, providing continuous, unobstructed assessments of cardiac activity via the transgastric short axis, midesophageal four chamber, and superior vena cava views. With such, preload and contractility, ventricular size and function, and volume responsiveness can be accurately evaluated and trended for change over time. hTEE as a monitoring modality is becoming more pervasive in ICUs on a world-wide scale, allowing for real time visualization of resuscitation and its therapeutic effects, a better understanding of resuscitation effects on individual patients, a more rapid conclusion to patient's resuscitation needs and provides the physician more confidence and patience in guiding complex volume resuscitations.

Description: This presentation will focus on discussing practical applications of the hTEE system and its benefits in critical care management. We will review four patients at our facility admitted to the ICU due to hemodynamic instability of varying etiologies that required volume resuscitation. With the videos, we will demonstrate how hTEE can guide patient therapy, often counter-intuitively, in the critically ill using the three basic cardiac views. Specific scenarios and hTEE videos include: 1) Volume resuscitation in ARDS, 2) Volume resuscitation guided by hTEE, 3) Under-resuscitation in a "routine" trauma case, and 4) De-escalation of therapy by weaning of high-dose vasopressors using hTEE monitoring.

Conclusions: hTEE is an excellent hemodynamic monitoring modality for the intensivist and has many practical applications in the management of the critical ill or injured patients. hTEE has demonstrated patient's resuscitation needs are often underestimated and that a more tailored approach to volume delivery is achievable, a particular benefit in the older and more co-morbid patient. Future applications of hTEE include CRRT volume management, organ donor hemodynamic optimization, and post-resuscitation monitoring in trauma patient requiring Massive Transfusion Protocol. These videos demonstrate examples of the benefits of real-time cardiac monitoring, which allowed for guided resuscitation and improved patient outcomes.

January 17, 2019
2:18 pm

FUTURE IS NOW: UTILIZATION OF EVOLVING TECHNOLOGY IN TRAUMA CARE

Shannon M. Foster, MD*, Pamela K. Jones, CRNP, Eugene F. Reilly, MD*
Reading Trauma Center, Tower Health

Presenter: Eugene F. Reilly, MD

Background: Trauma care delivery and quality assurance is often inefficient and labor-intensive. High technology is a ubiquitous adjunct to people's everyday lives, but adoption lags at the bedside where it might assist healthcare providers in elevating standards of care and adhering to best practices. Trauma resuscitations in particular — involving large multidisciplinary teams caring for complex, multiply injured patients — benefit from the incorporation of evolving technology and design into the patient care arena and medical record to improve teamwork and situational awareness.

Description: A video is presented demonstrating examples of advanced technology and design incorporated into the trauma bays, simulation, performance review, and medical record of our Level II trauma center. Examples include large format patient dashboards at the head of each bed, audiovisual components to augment real-time communication and retrospective chart review both on-site and remotely, simulation in own clinical care setting, and integration of mobile and wearable devices to improve the speed, security, and fidelity of critical information.

Conclusions: Incorporating modern concepts of information technology and design into trauma resuscitation workflows is feasible and improves efficiency, information exchange, and teamwork while optimizing patient care and reducing errors.

Quick Shots Parallel Session I

Quick Shot Paper #1
January 17, 2019
2:30 pm

EAST & AAST MEMBER ATTITUDES ON FIREARM INJURY PREVENTION AND ADVOCACY

Deborah A. Kuhls, MD*, Zara Cooper, MD, MSc*,
Joseph V. Sakran, MD, MPH, MPA, FACS*, Ronald M. Stewart, MD, FACS*,
Brendan T. Campbell, MD, MPH*, Eileen M. Bulger, MD, FACS*,
Lisa Allee Barmak, MSW, LICSW*, Ashley Hink, MD, Paul J. Chestovich, MD, FACS*,
Andrew C. Bernard, MD*, Michael F. Rotondo, MD, FACS*
EAST and AAST

Presenter: Deborah A. Kuhls, MD

Objectives: The purpose of this survey was to examine EAST & AAST member attitudes and opinions regarding policy issues and initiatives related to firearm injury prevention in the US.

Methods: An anonymous online survey was distributed to all EAST & AAST members in the US. The survey domains included: injury prevention, research, patient communication, personal responsibility & freedoms related to firearms and advocacy initiatives. Stata 14.2 was used for analysis; chi-square tests compared groups, with $p<0.05$ considered significant.

Results: 1255 EAST & AAST members participated in the survey (60% response rate). The majority (97%) were physicians; 81% were white; 23% were women; 27% have military experience; and the median age was 48 (SD +/-12.1). 43% of respondents were firearm owners with an average of 8 firearms in their home. 44% of respondents indicated that personal ownership of firearms is beneficial, 20% have no strong opinion or are unsure, and 36% indicated it is harmful. 90% support that decreasing firearm injuries & death should be given a high or the highest priority by the American College of Surgeons Committee on Trauma, 91% support federal funding for firearm injury prevention research and 95% feel it is important for healthcare providers to counsel patients on firearm safety, all of which varied by presence of firearm in the home ($p < 0.001$). More than 80% of members strongly agree or agree with 10 of 15 advocacy initiatives, more than 68% agree with all advocacy initiatives and there was no difference between EAST and AAST members (Table 1). 14 of 15 advocacy initiative responses varied by presence of firearm in the home, 10 of 15 varied by gender and 5 of 15 varied by age (< 47 vs > 48 years) ($p<0.05$).

Conclusions: EAST & AAST members unequivocally agree (>90% support) on the importance of formally addressing firearm injury prevention, research funding and counseling patients about firearm safety. The membership is divided on the general benefit of firearms; however, they strongly agree on 10 of the 15 advocacy initiatives (support by > 80% of members). These results are consistent with previous surveys and demonstrate room for a strong consensus approach focused upon reducing firearm injury, disability and death in the United States.

Table 1. EAST/AAST Support and Strong Support for Firearm Injury Prevention Advocacy Initiatives

Advocacy Initiative	EAST N=597	AAST N=202	Both* N=402
Improve mental health screening and resources	97%	98%	96%
Increase penalties for providing guns illegally	95%	97%	96%
Preventing people w/ mental illness from firearm purchase	94%	98%	96%
Evidence based injury prevention programs	93%	91%	92%
Funds available for research to understand/prevent gun violence	92%	91%	91%
Preserving healthcare providers' right to counsel patients/parents on firearm safety	91%	92%	91%
Mandatory background checks license/permit for all firearm purchases	90%	90%	90%
Mandatory prosecution felons for illegal firearm purchase	89%	94%	90%
Require gun safety features (smart gun, child proof locks)	85%	84%	81%
Prevention of people on no-fly list from firearm purchase	83%	89%	84%
Restrict civilian access to military/law enforcement ammunition	78%	83%	80%
Encouraging technology to identify purchaser of firearm/ammunition	77%	80%	74%
Federal database to track firearm sales	74%	76%	72%
Restrict civilian access to military-style/assault rifles	71%	75%	74%
Require age over 21 to purchase firearms	68%	77%	69%

* Both = Member of Both EAST and AAST, **p<0.05 (There were not statistically significant differences)

Table 1. EAST/AAST Support and Strong Support for Firearm Injury Prevention Advocacy Initiatives

Quick Shot Paper #2
January 17, 2019
2:36 pm

MASS SHOOTINGS IN AN URBAN TRAUMA SYSTEM: A SILENT EPIDEMIC

Jessica H. Beard, MD, MPH*, Shelby Resnick, MD*, Zoe Maher, MD*,
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Presenter: Jessica H. Beard, MD, MPH

Objectives: Recent attention has been paid to the role trauma centers play in response to mass shooting events. While the media focuses on high-profile shootings in schools and public places, firearm injured patients (FIPs) present in clusters to urban trauma centers every day. In this study, we explored the burden of mass shootings from the urban trauma system perspective, calculating the number of FIPs brought to hospitals in a single city at clustered time intervals over an 11-year period.

Methods: We used data from the city police registry of firearm assaults from 2005-2015. Variables studied were patient demographics, injury date and time, and receiving hospital. We used rolling temporal windows to calculate the number of FIP clusters for each hospital and evaluated trends in FIP cluster rates using linear regression.

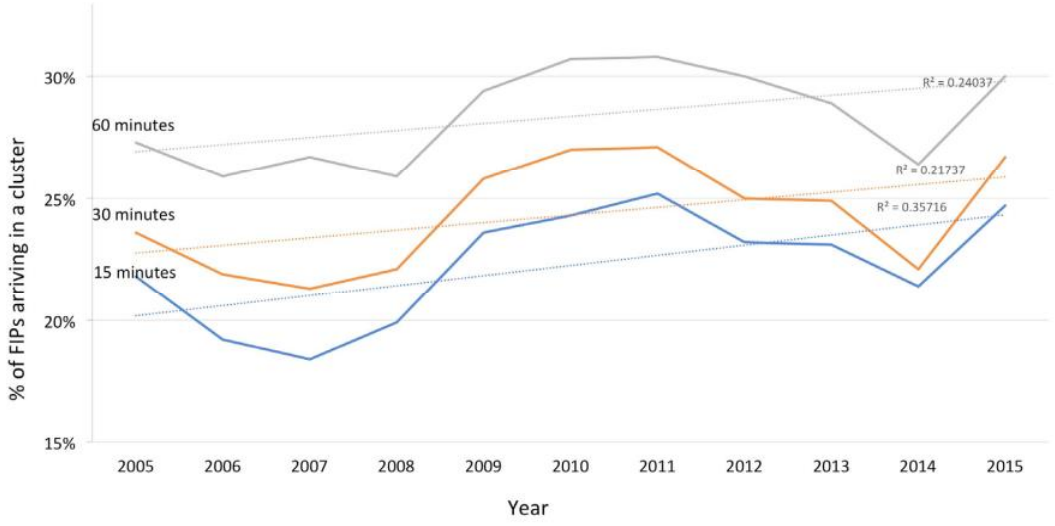
Results: Of the 14,228 FIPs included in the study, 28.3% (n=4,023) were clustered, arriving at the same hospital within 60 minutes of another FIP. Seventy-eight percent of these clustered patients (n=3,144) arrived within 15 minutes of another FIP, while 7.2% of patients in the 15 minute cluster group (n=227) arrived in clusters of = 4 FIPs. There were 54 events when = 4 FIPs presented within 15 minutes and 92 events when = 4 FIPs presented within 60 minutes of another FIP. FIP clusters occurred more frequently at night and at Level 1 trauma centers. The rate of clustered arrivals of FIPs remained steady over the course of the study.

Conclusions: Our findings indicate that FIP cluster events, which resemble mass shootings from the trauma system perspective, occur frequently in our urban context. However, little is known about the threshold at which these clustered patient arrivals result in system stress. Further research to determine the impact of FIP clusters on hospital resource utilization and patient-level outcomes is required.

FIP cluster count and temporal window	Counts of FIP cluster events			
	Level 1 trauma centers (n=9)	Level 2 trauma centers (n=3)	Non-trauma centers (n=9)	Total events
≥ 2 FIPs in 15 minutes	1331	27	59	1417
≥ 2 FIPs in 30 minutes	1450	27	62	1539
≥ 2 FIPs in 60 minutes	1677	29	64	1770
≥ 3 FIPs in 15 minutes	235	2	8	245
≥ 3 FIPs in 30 minutes	275	2	9	286
≥ 3 FIPs in 60 minutes	353	2	12	367
≥ 4 FIPs in 15 minutes	52	1	1	54
≥ 4 FIPs in 30 minutes	66	1	1	68
≥ 4 FIPs in 60 minutes	90	1	1	92

Table 1. Mass shooting events by time interval in an urban trauma system, 2005-2015

Figure 1. Trends in FIP clusters of ≥ 2 FIPs for three time intervals, 2005-2015



Quick Shot Paper #3
January 17, 2019
2:42 pm

INCREASED COSTS OF TRAUMA ACTIVATION FOR MINIMALLY INJURED PATIENTS

Michael T. Scott, MD, Waleed Abouelela, David Blitzer, MD, Timothy Murphy,
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Rutgers Robert Wood Johnson Medical School

Presenter: Michael T. Scott, MD

Objectives: In the era of value-based health care, ensuring patients receive optimal value for their health care dollar is essential. This study was designed to compare cost and outcomes for patients with minimal orthopedic injuries stratified by trauma service (TS) activation vs. other modes of hospital presentation (non-activation).

Methods: Retrospective trauma database analysis was performed at a Level 1 trauma center. Over a six year period, patients sustaining an isolated fracture to the distal upper or lower extremity were identified. Inclusion criteria included age 18-89 and **musculoskeletal AIS** = 3. Exclusion criteria included amputation and **AIS** > 1 for all other body areas. Costs and outcomes between patients who received TS activation were compared to the non-activation group. Data analyzed included age, gender, operative intervention (OR), **comorbidities**, **payor** status, costs, charges, hospital and emergency department (ED) length of stay. **Univariate** analysis and propensity score matching were used to compare groups.

Results: 982 patients were enrolled, 145 (14.8%) in the activation group. Propensity matching preliminarily matched 80 patients in each group. On **univariate** analysis, patients who received TS activation had shorter time to OR, but higher costs and charges (table 1). There was no significant difference in ED or hospital length of stay. Propensity matched cohorts demonstrated the same findings with shorter time to OR but with higher charges and costs. There was no difference in complications between groups.

Conclusions: TS activation for patients with isolated distal orthopedic injuries may not increase value. Although patients who received TS activation had reduced time to OR, this came at a greatly increased financial cost. Further study will have to determine if this provides additional value for the health care dollar. Strategies aimed at reducing overtriage without an increase in undertriage may be helpful.

Table 1:	Univariate			Propensity matched		
	TS Activation	Non-activation	p-value	TS Activation	Non-activation	p-value
Age (median years)	42 (31-54)*	52 (35-67)*	<0.01	39 (31-50)*	38 (25-50)*	ns
Number of Males	104 (71%)	407 (48%)	<0.01	58 (72%)	59 (73%)	ns
Number Needing OR	105 (72%)	675 (80%)	0.03	79 (98%)	79 (98%)	ns
Number of Complications	6 (4%)	15 (1%)	ns	3 (3%)	0 (0%)	ns
Time to OR (minutes)	445 (261-1,087)*	1191 (700-1,618)*	<0.01	431 (244-984)*	1,103 (567-1,472)*	0.01
Hospital Cost (median $)	14,695 (9,151-21,047)*	11,071 (8,042-14,739)*	<0.01	17,412 (13,439-27,714)*	11,757 (8,587-15,373)*	<0.01
Hospital Charges (median $)	71,904 (45,093-101,409)*	50,431 (34,822-69,816)*	<0.01	82,523 (63,290-124,516)*	47,332 (31,906-67,499)*	<0.01

TS-trauma service; ns-not significant (p-value >0.05); OR-operating room

**interquartile range*

Comparison between TS activation and non-activation groups of patients with minimal orthopedic injury. Not listed in the table, there were significant differences in **comorbidities** and **payor** status in **univariate** analysis. There were no differences in these variables in the propensity matched cohorts.

Quick Shot Paper #4
January 17, 2019
2:48 pm

OXYGEN MICROBUBBLES CORRECT ACUTE HYPOXIA IN A RAT MODEL OF SMOKE INHALATION INJURY

Keely Buesing, MD*, Crystal Krause, PhD, Nathan Bills, PhD, MBA,
Hannah Weber, BS, Connor Slagle, BS, Benjamin Terry, PhD, Mark Borden, PhD
University of Nebraska Medical Center

Presenter: Keely Buesing, MD

Objectives: Treatment of acute respiratory distress syndrome (ARDS) en-route is limited, and transport from injury to definitive care takes valuable time. Our lab has shown oxygenation with lipid-encapsulated oxygen microbubbles (OMBs) is an effective treatment in an animal model of thoracic trauma. Here, we develop a rat model of smoke-induced moderate to severe acute respiratory distress syndrome (ARDS), and test OMB effect on peripheral oxygen saturation (SpO_2).

Methods: Wistar rats were exposed to wood smoke (SE) for up to 6 hours/day x 7 days, and room air (RA) rats were not. Smoke concentration(mg/m^3), CO, and CO_2 levels, temperature, and relative humidity were monitored both in and outside the smoke exposure chamber. Baseline chest x-ray was obtained and after 7 days exposure to assess ARDS. Carotid artery catheters were used for blood gas (ABG) sampling. Rats received intraperitoneal (IP) OMBs or IP saline 1X/day x 3 days. SpO_2, ABG and HR were monitored before and at 20-25 min. Rats were euthanized, bronchoalveolar lavage was performed, and lung tissue harvested.

Results: SE rats exhibited decreased SpO_2 [83%±7 SD] and RA rats were at baseline at 7 days. IP OMB treatment significantly increased SpO_2 [ΔSpO_2 16%±5 SD)] versus IP saline [ΔSpO_2 -2.5%±6 SD]. Heart rate decreased in SE+IP saline treatment group [ΔHR=-30.5±6 SD BPM] and increased in SE+OMB [ΔHR=48±6 SD BPM]. Weights, serum HCO_3, Hb, total CO_2, and iCa did not change with OMB treatment.

Conclusions: OMB use for hypoxia after smoke inhalation-induced lung injury is feasible, offering a possibility for augmenting patient oxygen levels during transport, or as an alternative/bridge to ECMO. In cases where normal ventilation is not feasible due to lung damage, and where ECMO is not a feasible alternative due to sequelae of anticoagulant administration, OMBs may be the only modality available. Future studies will assess OMB infusion efficacy in the thoracic cavity.

Quick Shot Paper #5
January 17, 2019
2:54 pm

CORRELATION BETWEEN PTT AND XA VALUES IN AN ICU

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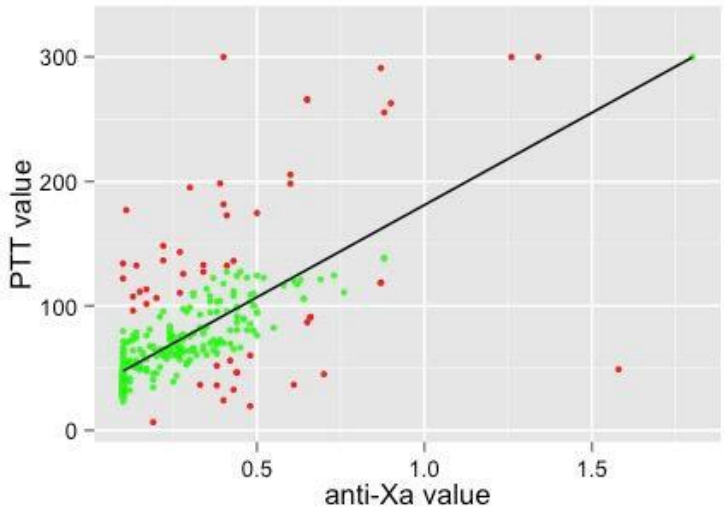
Presenter: Lauren Steward, MD

Objectives: Unfractionated heparin activity is usually measured via activated partial thromboplastin time (PTT). This indirect measure of the intrinsic coagulation pathway is altered by factor deficiencies, circulating inhibitors, liver dysfunction and hypercoagulable states. The anti–factor Xa assay (XA) is considered a more direct measure of anticoagulation. We hypothesize that poor correlation exists between PTT and XA values for some heparinized patients in a surgical intensive care unit.

Methods: We collected PTT values and XA values simultaneously for a cohort of patients therapeutically anticoagulated with heparin. We used a linear regression model to evaluate correlation between PTT and XA values and determine cases of discordance, defined as pairs with residuals > 1 SD from the regression line. Patients with at least 4 paired values were classified as “discordant" if a high proportion of their paired values were discordant (≥ 25%).

Results: We collected 353 simultaneous PTT and XA values in 47 patients. Simultaneous values showed good linear correlation (R=0.69), but with many discordant pairs (n=53, 15%). Usually PTT was high relative to expected given the XA value (n=34 of 53, 64%). There were 33 patients with at least 4 value pairs; 10 were classified as discordant and 23 as concordant. Compared to concordant patients, there were no significant differences, but there was a trend towards increased risk of bleeding complications in the discordant group (50% vs. 22%, p=0.23).

Conclusions: We found good correlation between PTT and XA values, but identified a subset of patients with poor correlation. Our study is limited by small sample size and failed to identify patient risk factors for discordance. The trend toward increased bleeding in discordant patients, while not significant, is concerning. This suggests a need for a multi-center trial to further evaluate risk factors for discordance so that these patients can be identified in the clinical setting.



Overall linear correlation between simultaneous XA and PTT values. Green values represent concordant values (n=300) while red values represent discordant values (n=53).

	Concordant Patients (n=23)	Discordant Patients (n=10)	P-value
Age in years, mean (SD)	47 (21)	58 (20)	0.16
Male sex	13 (57%)	4 (40%)	0.62
Any comorbidity	10 (44%)	7 (70%)	0.31
Chronic kidney disease	2 (9%)	3 (30%)	0.30
Coronary artery disease	4 (17%)	1 (10%)	0.99
Diabetes mellitus	2 (9%)	3 (30%)	0.30
Hyperlipidemia	5 (22%)	3 (30%)	0.95
Hypertension	7 (30.4%)	6 (60.0%)	0.23
Bleeding Complications	5 (22%)	5 (50%)	0.23
Length of stay in days, mean (SD)	34 (15)	35 (21)	0.83
Mortality	1 (4%)	1 (10%)	1

Table comparing demographics, baseline characteristics, and outcomes in individual patients with concordant versus discordant PTT and XA values.

Quick Shot Paper #6
January 17, 2019
3:00 pm

SUCCESSFUL MANAGEMENT OF SELECT RADIOGRAPHIC INTRACRANIAL INJURIES IN A RURAL TRAUMA CENTER WITHOUT NEUROSURGEON COVERAGE USING A MODIFIED BRAIN INJURY GUIDELINE

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Kylie Salvino, Danielle Stello, RN, Mathew M. Edavettal, MD, PhD, FACS*
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Presenter: Mathew M. Edavettal, MD, PhD

Objectives: It has been routine practice to consult a neurosurgeon for any radiographic intracranial injury; and for centers without this resource patients typically are transported by helicopter at a charge upwards of $49,800. Bellal, et al created the brain injury guidelines (BIG) and found that only patients requiring neurosurgical intervention were those with a BIG 3. The purpose of this study was to adopt a modified version of this guideline to treat BIG 1 & 2 by trauma surgeons in a trauma center without neurosurgeons.

Methods: In a retrospective cohort analysis, we reviewed the records of 3425 trauma registry patients during a 4 year period – 2 PRE-BIG and 2 POST-BIG adoption of a modified BIG. The only modification was the reversal of known anticoagulation before finalizing the initial BIG score. PRE-BIG, all BIG patients were transported for neurosurgical evaluation. POST-BIG, only BIG 3 patients were transported out of our facility; BIG 1 & 2 cared for by trauma surgeons with a repeat CT scan were included in this study.

Results: PRE-BIG 72 patients had scores of 36 BIG-3, 23 BIG-2 and 13 BIG-1. POST-BIG, 119 were identified; 67 BIG-3 were transported out and 52 patients were admitted - 13 were excluded. 39 patients had an initial BIG of 1 or 2 as well as repeat CT scan. Of these 39, none worsened clinically/radiographally; average LOS 1.4 days and an estimated savings of ~$1,942,200/transport charges was identified.

Conclusions: A modified brain injury guideline can be used to successfully triage intracranial injuries in a trauma center without neurosurgical coverage; admitting/treating BIG 1 & 2 and transporting BIG 3 resulting in improved resource management and reduction in transport costs. These guidelines, however, should be used in conjunction with good clinical judgment when managing patients with traumatic brain injury.

Quick Shot Paper #7
January 17, 2019
3:06 pm

INTRODUCTION OF A COLLABORATIVE PALLIATIVE CARE INITIATIVE ON AN ACUTE CARE SURGERY SERVICE

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Presenter: Tess H. Aulet, MD

Objectives: At our institution, the Acute Care Surgery (ACS) service cares for many frail patients with emergency general surgery or trauma diagnoses. These patients may not have advance care plans and often experience significant pain and suffering. The aim of this project was to provide a standardized process for referral of palliative care resources to promote patient centered and quality care.

Methods: Criteria were developed for protocol directed palliative care referral. Inpatients admitted to ACS for greater than 48 hours and met one or more of the following criteria were offered a palliative care consultation: age 85 or greater, admission from a skilled nursing facility, active malignancy, or trauma patient age 70 or greater with a ground level fall mechanism. A retrospective cohort comparison was performed between seasonally matched 6-month time periods in 2016 and 2017 before and after implementing the palliative care protocol.

Results: Sixty-nine patients met criteria for palliative care consults, 40 in 2016 and 29 in 2017. Of patients that received consults (n=20) 20% met criteria for active malignancy; 15% for skilled nursing facility; 60% for age 85 or greater; and 30% for age 70 or greater with a ground level fall. There were no differences between cohorts in criteria for consult. There was a trend toward shorter length of stay for those who received a consult in 2017 (median = 7 days) compared to 2016 (median= 9 days) (p=0.32) and in latency to consult, with a median of 5 days in 2016 and 2 days in 2017 (p=0.07).

Conclusions: Our experiences show a palliative care initiative within the ACS patient population is feasible. We identified a trend towards shorter latency to consult in 2017, achieving our aim of a more streamlined process for palliative consults. We have also demonstrated trends towards shorter length of stay after implementation of the initiative, suggesting improved health care utilization.

Quick Shot Paper #8
January 17, 2019
3:12 pm

UNDERTRIAGE DESPITE USE OF GERIATRIC-SPECIFIC TRAUMA TEAM ACTIVATION GUIDELINES: WHO ARE WE MISSING?

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Alexis Hess, MD, Andrew Nunn, MD*, Preston R. Miller III, MD*,
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Presenter: Ram V. Anantha, MD, MSc

Objectives: Implementation of geriatric-specific criteria for trauma team activation (TTA) has sought to identify severely injured elderly patients at many institutions. We sought to determine whether the addition of geriatric-specific TTA protocols (SBP<110; HR>100; anticoagulants) appropriately identified severely-injured elderly patients.

Methods: We retrospectively evaluated all severely injured (injury severity score [ISS]>15) geriatric (>= 65yo) patients admitted to our Level 1 trauma center from 2014 to 2017. Undertriage was defined as the lack of TTA despite presence of severe injuries. Our primary outcome was in-hospital mortality; secondary outcomes included early mortality and need for urgent hemorrhage control. Multivariable logistic regression analysis was performed to identify predictors of appropriate triage.

Results: Out of 1039 severely injured geriatric patients, 628 (61%) did *not* meet institutional TTA criteria. Undertriaged patients were older (79y vs 77y, p=0.001), had lower ISS (21 vs 26, p<0.0001), higher GCS (14 vs 12, p<0.0001), and higher SBP (146 vs 129 mmHg, p<0.0001) on admission. Significantly fewer undertriaged patients underwent hemorrhage control (1% vs 6%, p<0.0001). Undertriaged patients had significantly lower early mortality (1% vs 19%, p<0.0001), and in-hospital mortality (5% vs 31%, p<0.0001).

Conclusions: Implementation of geriatric-specific TTA guidelines continue to result in significant undertriage of elderly trauma patients when using ISS as a metric. However, our guidelines identify patients that need emergency intervention, and have increased mortality. These data suggest that the use of higher ISS as a marker of undertriage may not be useful or appropriate in older trauma patients.

Quick Shot Paper #9
January 17, 2019
3:18 pm

ATRIAL FIBRILLATION AND A FALL: RISK SCORES DO NOT ACCURATELY STRATIFY FOR STROKE OR BLEED IN ELDERLY FALL VICTIMS

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Presenter: Bryan Carr, MD

Objectives: Falls are the leading cause of morbidity and mortality in the elderly. Atrial fibrillation (AFIB) is present in 5% of this group and often prompts oral anticoagulation (OAC) use. Published stroke (CVA) rate with AFIB is 6.2/100 person-years, and major bleeding (MB) rate is 1.56/100 person-years. CHA_2DS_2-VASc (CHADS) and HAS-BLED (HB) scores are validated tools to assess risk of CVA and MB in AFIB patients. This study aims to identify how a fall alters the CVA and MB rates in AFIB patients. The hypothesis is fall patients are at higher risk of both CVA and MB.

Methods: Retrospective review of AFIB patients who presented to our emergency department after a fall from 2015-2017. CHADS and HB scores were calculated from admission data. All follow up information was reviewed up to 1 year. Patients were grouped based on discharge medication plan (DMP): no treatment, Anti-platelet (AP) only, OAC only, and AP+OAC. Outcomes included CVA, MB, and death by 1 year. CVA and MB rates were calculated. Kruskal-Wallis, X^2, and Fisher's exact tests were used to evaluate differences. $P<0.05$ was considered significant.

Results: 192 patients survived and were included. No differences between groups for age, sex, comorbidities, alcohol use, CHADS, and fall history existed. Mean CHADS score was 4.82, and HB score was 3.27. HB was 0.68 points lower in OAC only ($p=0.001$). Overall MB rate was 14.48/100 person-years, and CVA rate was 10.86/100 person-years (Table). There were no outcome differences between DMPs. Overall mortality at 1 year was 22.1%. CHADS did associate with CVA risk ($p=0.032$) but HB did not associate with MB risk ($p=0.170$).

Conclusions: Elderly AFIB patients who fall are at higher risk for both CVA and MB, and using current scoring tools does not accurately define this risk. Reconsideration of the score cutoffs is warranted to maximize benefit and minimize harm from our treatment recommendations.

CVA/100 person-years by CHA_2DS_2-VASc		MB/100 person-years by HAS-BLED	
1	0	**1**	16.2
2	0	**2**	9.7
3	10.5	**3**	12.3
4	10.0	**4**	16.6
5	9.1	**5**	23.3
6	7.9	**6**	29.4
7	12.0	**All Patients**	**14.48**
8	55.3		
All Patients	10.86		

Stroke/Transient Ischemic Attack (CVA) Rate and Major Bleeding (MB) Rates for each risk score in patients with AFIB who fall

Quick Shot Paper #10
January 17, 2019
3:24 pm

EARLY ANALYSIS OF LEVEL IV TRAUMA CENTERS WITHIN AN ORGANIZED TRAUMA SYSTEM

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Presenter: Tawnya Vernon, BA

Objectives: The impact of Level IV trauma center (TC) accreditation within an existing trauma network remains understudied. We sought to examine pre to post-accreditation data from Level IV TCs within a mature trauma system to determine whether TC designation affected time to and/or rate of transfer to definitive care. We hypothesized that Level IV TCs would have a decreased rate of transfer following accreditation but would likely have improved mortality

Methods: The Pennsylvania Trauma Systems Foundation (PTSF) collects pre and post-designation data from hospitals undergoing the TC accreditation process. This data from all TCs requesting Level IV designation in PTSF from 2012-2017 were analyzed. Variables of interest included patient demographics, injury severity statistics, mortality and incidence of surgical interventions pre to post-credentialing. A multilevel mixed-effects logistic regression model assessed the adjusted impact of Level IV TC accreditation on transfer rate.

Results: Five hospitals underwent Level IV credentialing from 2012-2017, providing data on 5,041 cases (Pre: 2,395 [47.5%]; Post: 2,646 [52.5%]). No significant difference in age, admission Glasgow Coma Scale score, or shock index was observed pre to post-accreditation. No difference in transfer rate was observed pre to post-credentialing in unadjusted (62.7% vs. 63.3%; p=0.68) analysis or adjusted analysis (AOR: 0.927, p=0.299). There was also a trend towards a decline in mortality post-credentialing (AOR: 0.61, p=0.091) and major surgical intervention (Pre: 10, Post: 1). Of note, a higher percentage of patients presented to TCs in private vehicle to Level IV vs. other TCs in the state (30.29% vs. 21.24%).

Conclusions: Level IV TC accreditation does not result in increased trauma patient retention rates but may improve overall mortality. It is important to continue to observe the impact of Level IV TCs on the outcome of patients within a mature trauma system.

		Transfer
Variable	**AOR** (95% CI)	*p*
Post-Accreditation	0.927 [0.804-1.069]	0.299
Age	0.973 [0.970-0.976]	<0.001
Male sex	1.437 [1.209-1.706]	<0.001
Injury Severity Score	1.057 [1.041-1.073]	<0.001
Glasgow Coma Scale Score	1.095 [1.061-1.131]	<0.001
		AUROC: 0.765

Quick Shot Paper #11
January 17, 2019
2:30 pm

VALIDATION OF THE AMERICAN ASSOCIATION FOR THE SURGERY OF TRAUMA (AAST) EMERGENCY GENERAL SURGERY SCORE FOR ACUTE APPENDICITIS: A POST-HOC SECONDARY ANALYSIS

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University of Miami Miller School of Medicine

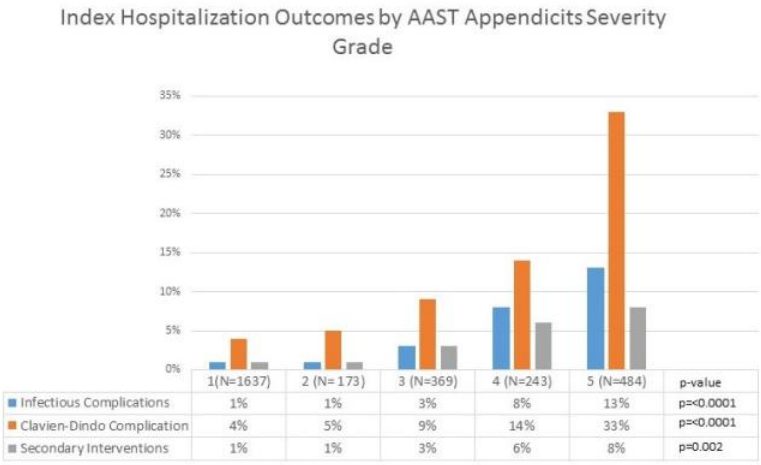
Presenter: Georgia Vasileiou

Objectives: The AAST has proposed a grading system for anatomic severity of 16 Emergency General Surgery conditions, including appendicitis. This is the first prospective, multi-center clinical study evaluating the AAST Appendicitis grading scale.

Methods: The EAST Appendicitis Multicenter Study utilized data collected prospectively from 27 centers, between 1/17 – 5/18. An overall Grade was assigned as the highest grade of the sub-scales: radiographic, operative, and pathologic. Grade 1-3 of the clinical sub-scale was assigned as Grade 1. Patients with a final diagnosis other than appendicitis were excluded. The Cochran-Armitage trend and Jonckheere-Terpstra tests were used to determine association between the overall AAST grade and the following outcomes: infectious complications, Clavien-Dindo complications, hospital length of stay (LOS), 30-day Emergency Department (ED) visits, readmissions, and secondary interventions. *P*-values <0.05 were considered statistically significant.

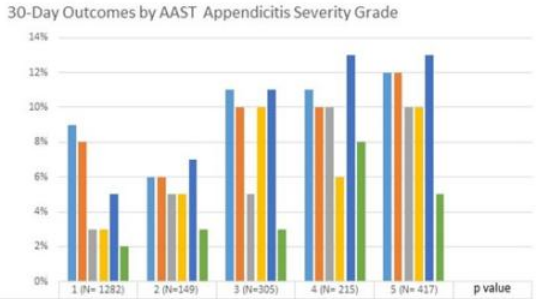
Results: After exclusions, 2,096 patients were included; 91% underwent appendectomy, and 16% were lost to 30-day follow up. Median index hospitalization LOS increased significantly with increasing grade from 1 to 5: 1 [1,1], 1 [1,1], 1 [1,2], 2 [3,4], and 2 [3,5] ($p<0.001$). Infectious complications, Clavien-Dindo complications, and secondary interventions were significantly associated with increasing AAST severity grade during index hospitalization (Figure 1). For 30-day outcomes, similar trends were noted for hospital readmissions and Clavien-Dindo complications (Figure 2).

Conclusions: The AAST EGS grade for appendicitis is a valid predictor of clinical outcomes such as infectious complications, overall complications, and the need for secondary intervention.



	1(N=1637)	2 (N= 173)	3 (N=369)	4 (N=243)	5 (N=484)	p-value
Infectious Complications	1%	1%	3%	8%	13%	p=<0.0001
Clavien-Dindo Complication	4%	5%	9%	14%	33%	p=<0.0001
Secondary Interventions	1%	1%	3%	6%	8%	p=0.002

Figure 1 – Index Hospitalization Outcomes



	1 (N= 1282)	2 (N=149)	3 (N=305)	4 (N= 215)	5 (N= 417)	p value
30-Day ED visit	9%	6%	11%	11%	12%	p=0.242
Appendicitis-related ED visit	8%	6%	10%	10%	12%	p=0.189
30-Day Readmission	3%	5%	5%	10%	10%	p=0.015
30-Day Infectious Complications	3%	5%	10%	6%	10%	p=0.059
30-Day Clavien-Dindo Complications	5%	7%	11%	13%	13%	p=0.019
30-Day Secondary Intervention	2%	3%	3%	8%	5%	p=0.082

Figure 2 – 30-Day Outcomes

Quick Shot Paper #12
January 17, 2019
2:36 pm

A COMPARATIVE STUDY ON THE EFFICACY OF HYPERTONIC SALINE BOLUS OR CONTINUOUS INFUSION FOR THE TREATMENT OF CEREBRAL EDEMA AND ELEVATED INTRACRANIAL PRESSURE FOLLOWING TRAUMATIC BRAIN INJURY

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Presenter: Matthew Lamb, MD

Objectives: To direct compare HTS administration head to head in hopes of establishing the standard of care for bolus versus infusion

Methods: A multicenter retrospective cohort analysis was conducted for all blunt trauma patients sustaining a severe TBI requiring ICP monitoring and HTS therapy during a 3 year period. Patients were divided into two treatment groups by receiving either 7.5% HTS bolus versus 3% HTS maintenance therapy for elevated ICP >20. Patient demographics, GCS score, ISS, and ICPs were recorded. Outcome variables including length of stay (LOS), ICU LOS, ventilator days, and mortality were analyzed. Patients with penetrating injury, no ICP monitoring, or those with craniotomy or craniectomy were excluded from the study. For our study, we considered $p \leq 0.05$ as statistically significant.

Results: A total of 68 patients with TBI requiring ICP monitoring and HTS therapy were included in the analysis. The mean age was 39.1 years, 75% were male, median GCS score was 8, median ISS was 28. We found no difference in ICP, LOS, ICU LOS, and ventilator days between patients receiving HTS bolus and HTS maintenance. There is a significantly increased mortality among patients that received bolus ($p=0.01$) of 64% and the maintenance therapy being only 34%.

Conclusions: While there were no significant differences in morbidity identified in our study the mortality rate was 50% higher in the bolus group indicating a significant benefit to the continuous infusion. We feel this is due to the variability of ICPs experienced during bolus administration. This study is one of just a few early retrospective trials comparing to two forms of HTS administration; all of which seem to favor infusion over bolus.

Table 1 - Demographics and Outcome Variables for Efficacy of Saline Bolus and Continuous Infusion

	HTS Bolus	HTS Continuous Infusion	All HTS Administration
Age, mean (SD), y	34 (15.4)	44.2 (22.9)	39.1 (20.0)
Male sex, No. (%)	25 (73.5%)	27 (77.1%)	52 (75.4%)
ISS, mean (SD)*	28.3 (9.0)	27.1 (10.5)	27.6 (9.7)
GCS, mean (SD)**	8 (3.7)	8 (3.3)	8 (3.5)
Total LOS, mean (SD)	20.1 (17.7)	29.3 (32.0)	24.8 (26.2)
ICU LOS	17.0 (15.1)	17.7 (13.3)	17.3 (14.1)
Ventilator Days	13.0 (10.7)	14.3 (10.0)	13.6 (10.3)
Mortality[1]	22 (64.7%)	12 (34.3%)	34 (49.3%)

SD, standard deviation; ISS, injury severity score; GCS, Glasgow coma scale; LOS, length of stay; ICU, intensive care unit

*ISS measured at time of admission

**GCS measured at time of admission

[1] There is a significantly increased odds of mortality among patients that received the saline bolus vs saline continuous infusion (OR=3.51; 95%CI: 1.30-9.47).

Quick Shot Paper #13
January 17, 2019
2:42 pm

A NOVEL USE OF THE TRAUMA REGISTRY: INCIDENTAL FINDINGS IN THE TRAUMA PATIENT

Jordan Shealy, MD, Natalie Cross, BS, R. Eric Heidel, PhD, James W. Goodin, MD*
University of Tennessee Medical Center-Knoxville

Presenter: Jordan Shealy, MD

Objectives: Incidental findings (IF) have a quoted incidence of 25-50% on CT scans for trauma. Trauma registries (TR) are tools for quality metrics and performance improvement. We utilized our registry to improve report of IF to trauma patients (pts).

Methods: A retrospective review of 615 pts evaluated at an urban Level I trauma center from June 2016-June 2017. 100 randomized pts without IF entered in the TR were abstracted for comparison. Data abstracted included demographics, IF diagnosis and malignant potential, and method of disclosure. Statistical analysis was performed by a doctorate level statistician utilizing SPSS 22 program.

Results: Of 6223 pts evaluated by the trauma service, 615 (22%), pts had 1222 IF captured by the TR, averaging 1.98 per pt (range 1-8).Mean pt age was 55. Male: female was 376 (61%) : 239 (39%). MVC (342) and falls (200) were the most common mechanisms of injury. Highest number of findings were in the abdomen (725) and chest (200). Most common IF were: lung nodule (209),hernia (112) and renal cyst (103). 374 (60%) pts were informed about IF prior to discharge. For pts discharged prior to documented disclosure, TR capture resulted in an additional 20% disclosure. 7 (1%)pts were informed in clinic, 114 (19%) by phone call or letter. 58(10%) had unsuccessful attempts to contact the pt, even though captured by TR. 43(7%) pts had no documented attempt to notify. In the control group, 30% of IF were not abstracted in the TR. Avg days to disclosure was 42 (range 0-226). Minimum time to disclosure by TR capture was 45 days. When radiology labelled IF, 78% (479)of pts had documented disclosure prior to discharge vs. 22% if noted only in the body of CT report.

Conclusions: Our TR insured an additional 20% of pts were informed about IF. Radiology collaboration enhances disclosure prior to discharge. Collecting IF data is a worthwhile use of the TR, but documented disclosure prior to discharge is optimal.

Quick Shot Paper #14
January 17, 2019
2:48 pm

A NOVEL PROTOCOL TO MAINTAIN CONTINUOUS ACCESS TO THAWED PLASMA AT A RURAL TRAUMA CENTER

Cara Hannigan, MD, Gabriel Ologun, MD, Andrew Trecartin, MD,
Lauren Colom, MD, Ry Bloomdahl, MD, Lisa LaRock, RN, CCRN, PHRN,
Amanda Seyer, BS, Barbara Tubby, MT, Paul Granet, MD*, Rob Behm, MD*
Guthrie Clinic

Presenter: Cara Hannigan, MD

Objectives: Early administration of fresh frozen plasma improves mortality in massively transfused patients, but the thawing process causes delay. Small rural centers have been reluctant to maintain thawed plasma due to waste concerns. Our 256-bed rural center initiated a protocol allowing continuous access to thawed plasma and we hypothesized its implementation would not increase waste or cost.

Methods: Two units of thawed plasma are continuously maintained in the trauma bay blood refrigerator. After 3 days these units are replaced with freshly thawed plasma and returned to the blood bank for utilization prior to their 5-day expiration date. The blood bank monitors and rotates the plasma. Only trauma surgeons can use the plasma stored in the trauma bay. Wasted units and cost were measured over a 12-month period and compared to the previous 2 years.

Results: The blood bank thawed 1127 units of plasma during the study period assigning 274 to the trauma bay. Waste during the study period can be seen in Table 1. When compared to previous years' waste and cost using Pearson's chi-squared test of independence, we found a significant increase in waste ($p<0.001$) and cost ($p<0.05$) after implementing our protocol. It cost approximately $117/month extra to maintain continuous access to thawed plasma during the study period. The cost of wasted plasma was 1.56% of the total institutional wasted blood product expense. Using a general linear model, we found no significant increase in relative cost of plasma waste ($p=0.1$) compared to previous years.

Conclusions: A protocol to maintain thawed plasma in the trauma bay at a rural level II trauma center resulted in increased waste and cost. This cost is minuscule in the scope of operating a trauma center and was insignificant when compared to the cost of total blood bank waste. Constant availability of thawed plasma can be offered at smaller rural centers without a meaningful impact on cost.

	2015	2016	2017
Total units of plasma thawed	1405	1191	1127
Total units of plasma transfused	1360	1145	1051
Total units of plasma wasted	45	46	76
Percent of plasma waste	3.20%	3.86%	6.74%
Cost of plasma waste	$2,070	$2,116	$3,496
Cost of total blood product waste	$190,943	$187,616	$224,539
Relative cost of plasma waste	1.08%	1.12%	1.56%

Table 1: Total plasma utilization, waste and cost during the 2017 study period compared with previous years

Quick Shot Paper #15
January 17, 2019
2:54 pm

GENDER DIFFERENCES IN NATIONWIDE OUTCOMES AND HOSPITALIZATION COSTS FOR INTIMATE PARTNER VIOLENCE

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Presenter: Tanya L. Zakrison, MD, MPH, FRCSC, FACS

Objectives: The purpose of this study was to compare the gender differences in outcomes and hospitalization costs related to intimate partner violence (IPV).

Methods: The Nationwide Readmissions Database for 2010-2014 was used to identify survivors of IPV. The outcomes of interest were length of stay (LOS), cost of index admission, readmission within 30 days, and readmission to a different hospital. Continuous variables were compared using Student's t-test and categorical variables were compared using a Chi-squared test. Significant variables ($p<0.05$) on univariable analysis were used for multivariable logistic regression and reported as odds ratios (OR).

Results: There were 19,862 patients identified with hospital stays for IPV during the study period. Males comprised 10.6% of patients and they had a similar mean Injury Severity Score as females (ISS, 2.6 +/-5.1 vs 2.7 +/-5.3, $p=0.27$). Males had a longer mean LOS than females (7.9 +/-13.3 days vs 5.5 +/-8.7 days, $p<0.01$). The mean cost of index admission was also higher for males ($12,261 +/-$17,079 versus $9,791 +/-$15,977, $p<0.01$). Multivariable logistic regression revealed that an increased risk for prolonged LOS (>7 days) was found for patients with an ISS>15 (OR 2.4, $p<0.01$) and male gender (OR 1.4, $p<0.01$). An increased risk for a high cost of index admission (highest quartile) was present for patients with an ISS>15 (OR 4.3, $p<0.01$) and male gender (OR 1.2, $p<0.01$). The rate of readmission within 30-days was 13.6% and readmission to a different hospital occurred in 36.3%. Males were at an increased risk for readmission within 30 days (OR 1.3, $p<0.01$) and there was no gender difference on readmission rates to a different hospital ($p=0.14$).

Conclusions: Despite similar injury severity scores and when controlling for severe injuries, males have worse outcomes and increased cost after hospitalization for intimate partner violence. One in seven men affected by IPV are readmitted to hospital within 30 days, with a third to different hospitals. This may demonstrate fragmentation of care of a previously unrecognized vulnerable patient population. Outcome improvement efforts for these patients should be focused on the risk factors identified in this study.

Quick Shot Paper #16
January 17, 2019
3:00 pm

LIMITATIONS OF AVAILABLE BLOOD PRODUCTS FOR MASSIVE TRANSFUSION DURING MASS CASUALTY EVENTS AT US LEVEL 1 TRAUMA CENTERS

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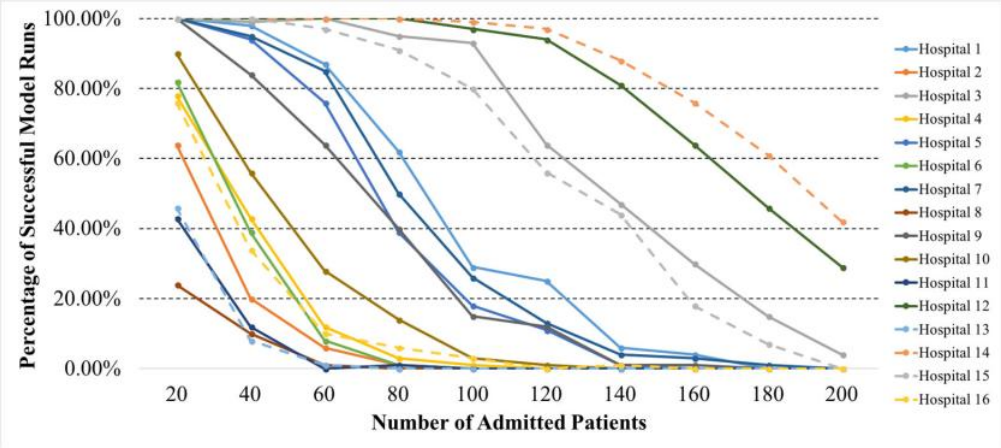
Presenter: James Williams, BS

Objectives: This study investigated the ability of US trauma centers (TC) to meet the blood product requirements of mass casualty events (MCE) through the use of a computerized model.

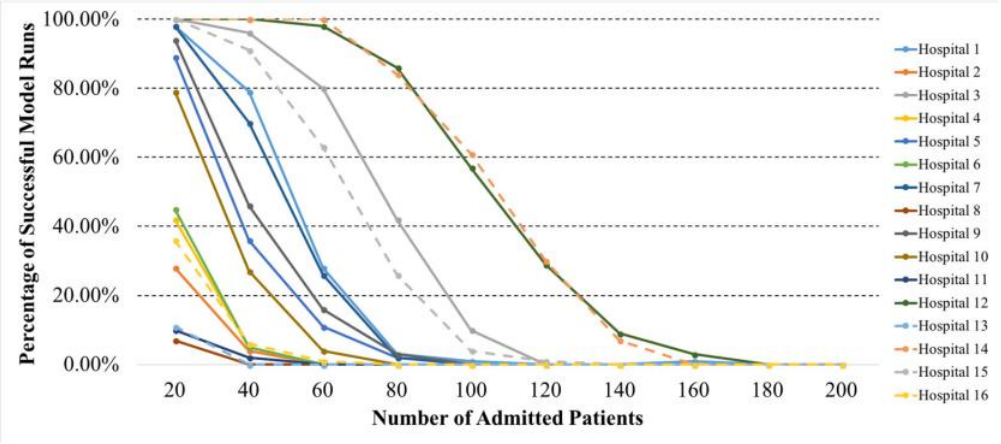
Methods: Cross-sectional survey data of on-hand blood products was requested from 20 level-1 TCs in the US, with 16 submitting a full response. A discrete event simulation model of a TC was developed based on historic data of blood product consumption during MCE. Each hospital's blood bank was evaluated across increasingly more demanding MCE using each institution's massive transfusion protocol (MTP) to guide resuscitation efforts in massive transfusion (MT) patients. TCs were evaluated on their ability to meet the blood product requirements of patients using a MTP for MT patients and the maximum number of patients treated.

Results: 9,000 simulations were performed on each TC's data. Under the least demanding MCE scenario (20% of patients receiving blood products and 6% MT rate), >50% of surveyed TCs failed to adequately meet the blood product requirements of 60 MCE patients (**FIGURE 1**). Under the most demanding MCE scenario (40% receiving blood and 10% MT rate), >50% of surveyed TCs failed to adequately meet the blood product requirements of 40 patients (**FIGURE 2**). More concerning, over half of surveyed TCs are unable to adequately treat four MT patients, not considering platelets, and two MT patients when considering platelets.

Conclusions: US level-1 TCs lack the on-hand blood products required to adequately treat patients following a MCE. By identifying blood product limitations, TCs and their local blood suppliers can make critical changes to their inventories in hopes of better preparing for such unfortunate events. Such alterations in supply may also improve care of MT patients in non-MCE scenarios. Consideration of non-traditional blood products, with longer shelf life, may allow TCs to better meet the transfusion needs of patients following larger MCEs.



Percentage of successful model runs across all 16 TCs when 20% of admitted patients require blood products and 6% require massive transfusion



Percentage of successful model runs across all 16 TCs when 40% of admitted patients require blood products and 10% require massive transfusion

Quick Shot Paper #17
January 17, 2019
3:06 pm

YOUNG LIVES CUT SHORT-THE RELATIONSHIP BETWEEN FIREARMS AND PEDIATRIC SUICIDE

Robert J. McLoughlin, MD, Max Hazeltine, MD, Brittany Dacier, MPH, Michael P. Hirsh, MD*, Muriel Cleary, MD, Jeremy T. Aidlen, MD*
University of Massachusetts

Presenter: Robert J. McLoughlin, MD

Objectives: To describe the demographics and burden of pediatric suicides by firearm in the U.S. in a large, publicly-available, all-payer, pediatric inpatient care database

Methods: Pediatric patients (<21 years old) were identified with an ICD-9 diagnosis of suicide and self-inflicted injury with a firearm (SIF) (E955.0-E955.4) in the Kids? Inpatient Database in a combined dataset for 2006, 2009 and 2012. Patient characteristics were analyzed using ICD-9 codes. National estimates were obtained using case weighting. Independent multivariable logistic regression was performed adjusting for gender, race, location, income quartile, payer, season and year with separate models incorporating mental health diagnoses. P-values <0.05 indicated significance.

Results: There were 613 hospitalizations for SIF with a mean age of 17.3 years (95% CI 17.1-17.5). Almost four hospitalizations per-week occurred, and mortality was 39.1%. The population was predominantly male (87.5%), white (62.4%), resided in an urban area (43.8%), in the South (51.3%), and within the lowest income quartile (33.8%). Mental health disorders (38.3%) and mood disorders (28.3%) were common. Males had an over 7-fold increased likelihood of a hospitalization for SIF (aOR 7.56, 95% CI: 5.54-10.30). Children and adolescents from rural environments and those in the South were more likely to have a hospitalization for SIF. Using separate regression models, a diagnosis of any mental health disorder increased the likelihood of a hospitalization for a SIF by 11-fold (aOR 11.9, 95% CI: 9.51-14.9), mood disorders by 17-fold (aOR 17.2, 95% CI: 13.3-22.3), and depression by 21-fold (aOR 21.3, 95% CI: 16.1-28.3).

Conclusions: Pediatric hospitalizations for SIF are a common occurrence with high associated mortality. The prevalence of mental health disorders, and their impact, within this population highlight the need for early identification and intervention for individuals at risk.

	Suicides
	n (%)
Total	613
Age, mean (95% CI)	17.3 (17.1, 17.5)
Male	536 (87.5)
Race	
White	383 (62.4)
Black	95 (15.5)
Hispanic	87 (14.2)
Region	
Northeast	56 (9.2)
Midwest	96 (15.7)
South	314 (51.3)
West	133 (21.8)
Died during hospitalization	240 (39.1)
Income Quartile by Zip code	
1st	207 (33.8)
2nd	180 (29.4)
3rd	124 (20.2)
4th	102 (16.6)
Patient Setting	
Urban	268 (43.8)
Suburban	196 (32.0)
Rural	142 (23.1)
ICU Admission	323 (52.6)
Major Surgical Procedure	273 (44.5)
Firearm Type	
Handgun	332 (54.2)
Shotgun	55 (8.93)
Hunting rifle	40 (6.61)
Other gun	186 (30.3)
Mental Health	
Any Mental Health Disord	234 (38.3)
Mood Disorder	173 (28.3)
Depression	92 (15.1)
Alcohol-related disorder	39 (6.35)
Substance-abuse disorder	55 (8.94)

Table 1: Patient Characteristics and Demographics

Hospitalization for Suicide Attempt by Firearm				
			95% C.I.	
	Odds Ratio	p-value	Lower	Upper
Male	7.56	0.00	5.54	10.30
Race				
White	Reference			
Black	1.00	0.98	0.72	1.38
Hispanic	0.62	0.01	0.44	0.89
Asian or Pacific Islander	0.27	0.04	0.08	0.96
Hospital Region				
Northeast	Reference			
Midwest	1.85	0.00	1.21	2.83
South	2.55	0.00	1.70	3.83
West	2.42	0.00	1.58	3.70
Income Quartile by Zip code				
1	Reference			
2	1.09	0.50	0.84	1.41
3	0.86	0.33	0.63	1.17
4	0.83	0.30	0.59	1.18
Patient Setting				
Urban	Reference			
Suburban	1.22	0.18	0.91	1.64
Rural	1.62	0.00	1.18	2.23
Mental Health*				
Any Mental Health Disord	11.9	0.00	9.51	14.9
Any Mood Disorder	17.2	0.00	13.3	22.3
Depression	21.4	0.00	16.1	28.4
Alcohol Use Disorder	11.1	0.00	7.29	17.0

* indicates independent multivariable logistic regression models run for each mental health diagnosis of interest

Table 2: Multivariate Logistic Regression Assessing Factors Associated with Pediatric Suicide with Firearms

Quick Shot Paper #18
January 17, 2019
3:12 pm

PREDICTING LENGTH OF STAY FOR TRAUMA AND EMERGENCY GENERAL SURGERY PATIENTS

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Northwestern University

Presenter: Benjamin W. Stocker, BS

Objectives: Patients prioritize knowing their length of stay (LOS) prior to an admission. For trauma and emergency general surgery (TEGS) patients, predicting LOS can be difficult and frustrating to the patient and family. The objective of our study was to determine the accuracy of clinician and NSQIP predicted LOS for TEGS patients and factors associated with inaccurate predictions.

Methods: TEGS clinicians (attendings, residents, medical students, PA/NPs) predicted the LOS for non-consecutive TEGS patients within 24 hours of admission from February through June 2018. The NSQIP risk calculator was separately used to predict LOS for patients who underwent surgery. LOS predictions were compared to actual LOS. The top quintile of inaccurate predictions, as measured by the absolute difference between predicted and actual LOS, was compared to the rest of the cohort to determine clinical and patient factors associated with inaccurate predictions.

Results: 2,160 predictions of LOS for 135 patients were collected. The median actual LOS was 3 days (IQR 1-5). 61.5% of patients were admitted to the emergency surgery service and 57.8% underwent surgery. Clinician predictions did not differ significantly from actual LOS or NSQIP predictions (Table 1). Inaccurate predictions for both NSQIP and clinicians were associated with longer actual LOS, trauma admission, surgeries other than appendectomy and cholecystectomy, higher APACHEII scores, higher ASA scores and loss of independence. Clinician predictions were less accurate for older patients and those with higher Charlson Comorbidity Index scores. (Table 2).

Conclusions: For healthier TEGS patients undergoing routine surgeries, both clinicians and NSQIP accurately predict LOS. However, for trauma patients, more complex patients and more complex surgery, both NSQIP and clinicians were inaccurate. Further research is needed to identify ways to increase the accuracy of TEGS LOS predictions.

	Number of predictions	Number of days (med, IQR)	p value*
All TEGS Patients			
Actual length of stay	135	3, 1-5	-
Medical Student	302	3, 1-5	0.6653
Junior resident	306	3, 1-4	0.2623
Senior resident	95	2, 1-4	0.0912
Fellow	8	4, 2.5-5.5	0.4087
Attending	135	3, 1-5	0.4916
Advanced practice provider	208	3, 2-5	0.5620
NSQIP prediction^	78	2, 1-6	0.7579
Surgically Managed patients			
NSQIP prediction	78	2, 1-6	-
Medical Student	174	2, 1-5	0.4297
Junior resident	187	2, 1-4	0.6709
Senior resident	58	2, 1-4	0.6622
Fellow	6	4, 2-5	0.3102
Attending	75	2, 1-5	0.7531
Advanced practice provider	124	3, 1-5	0.1685

*Wilcoxon rank-sum test

^surgical patients only

Table 1: Accuracy of clinicians and NSQIP as compared to actual length of stay of all TEGS patients and accuracy of clinicians as compared to NSQIP for surgically managed TEGS patients.

	NSQIP			Clinicians		
	Inaccurate (n=12)	Accurate (n=66)	p value*	Inaccurate (n=28)	Accurate (n=109)	p value*
Age (median, IQR)	49.5 (36-62	55 (38-74)	0.1457	59.5 (39-66)	43 (30-61)	**0.0247**
Female	7 (58.3)	31 (47.0)	0.541	12 (46.2)	46 (42.2)	0.826
LOS (median, IQR)	11.5 (7.5-16)	3 (2-5)	**<0.0001**	10 (8-14)	2 (1-4)	**<0.0001**
Weekend admission	6 (50.0)	14 (21.2)	*0.066*	7 (26.9)	31 (28.4)	0.544
Service			**0.001**			**0.003**
Trauma	7 (58.3)	7 (10.6)		17 (65.4)	35 (32.1)	
Acute care surgery	5 (41.7)	59 (89.4)		9 (34.6)	74 (67.9)	
Surgery			**<0.001**			**<0.001**
None	-	-		8 (30.8)	49 (45.0)	
Appendectomy	0	30 (45.5)		0	30 (27.5)	
Laparoscopic Cholecystectomy	1 (8.3)	19 (28.8)		0	20 (18.4)	
Other	11 (91.7)	17 (25.8)		18 (69.2)	10 (9.2)	
Charlson Comorbidity index			0.186			**0.001**
Zero	4 (33.3)	39 (59.1)		5 (19.2)	61 (55.0)	
One	2 (16.7)	8 (12.1)		3 (11.5)	12 (11.0)	
Two or more	6 (50.0)	19 (28.8)		18 (69.2)	36 (33.0)	
APACHE II Score at admission			**0.001**			**<0.001**
Not critically ill	4 (33.3)	58 (87.9)		9 (34.6)	95 (87.2)	
Mild	0	0		0	2 (1.8)	
Moderate	4 (33.3)	6 (9.1)		7 (26.9)	11 (10.1)	
Severe	4 (33.3)	2 (3.0)		10 (38.5)	1 (0.9)	
ASA score			**0.002**			**<0.001**
Non-operative	-	-		8 (30.8)	48 (44.0)	
I	0	19 (28.8)		0	19 (17.4)	
II	3 (25.0)	32 (48.5)		4 (15.4)	31 (28.4)	
III	6 (50.0)	11 (16.7)		9 (34.6)	9 (8.3)	
IV	2 (16.7)	4 (6.1)		4 (15.4)	2 (1.8)	
V	1 (8.3)	0		1 (3.9)	0	
Discharge location			**0.004**			**<0.001**
Home/return to facility	6 (50.0)	59 (89.4)		13 (50.0)	99 (90.8)	
Other/Loss of Independence	6 (50.0)	7 (10.6)		13 (50.0)	10 (9.2)	

*Wilcoxon rank sum, chi-2, or Fisher exact where appropriate

Table 2: Patient characteristics for inaccurate NSQIP and pooled clinician predictions as defined as the top quintile for difference in days between predicted and actual LOS for each group as compared to accurate cohort.

Quick Shot Paper #19
January 17, 2019
3:18 pm

COMPARING REALITY TO CONSENSUS: REPORTED OPIOID USE VS. CLINICIAN CONSENSUS RECOMMENDATIONS

Kortney A. Robinson, MD
Beth Israel Deaconess Medical Center

Presenter: Kortney A. Robinson, MD

Objectives: Surgeons prescribe large quantities of opiates for post-operative pain without having practice guidelines based upon actual patient usage. We sought to compare recently published consensus guidelines with actual patient reported consumption.

Methods: From 10/2017-2/2018, postoperative patients across most major specialties from a single institution were contacted within a month after surgery to obtain unused medication pill counts, pain ratings, patient expectations and experience, and medication disposal methods.

Results: 1364/1882 (73%) of patients completed the survey. 1084 patients were able to give counts of their primary opiate prescription as well as refills, while 180 patients were not prescribed opiates. 46% reported not taking a single opiate pill after discharge from the hospital. In total, 20,138 (41%) pills prescribed were unused. Compared to a common consensus document, our patient data suggested median and third quartile consumption of less than 50% of current consensus recommendations. Please see table for details.

Furthermore, our data demonstrates that patients with known risk factors for misuse--anxiety, depression, ADHD, mood disorders and alcohol abuse--consume opioids in different patterns than patients without these diagnoses.

Conclusions: Post-discharge opioid consumption data suggests that consensus documents still significantly overestimate opioid requirements. Our granular use data among different patient groups allows prescribers to reference actual needs for post-operative pain control.

	Number of 5mg Oxycodone Tablets			
Procedure	**Consensus Document Recommendation**	**Patient Use Median**	**25th Percentile**	**75th Percentile**
Partial Mastectomy	10	0	0	0
Laparoscopic Cholecystectomy	10	1.0	0	5.0
Laparoscopic Appendectomy	10	2.4	0	5.0

Table 1: Consensus Recommendations Compared to Actual Patient Use

Quick Shot Paper #20
January 17, 2019
3:24 pm

HIGHER INJURY SEVERITY SCORE IS ASSOCIATED WITH INFLAMMATORY STATE AND SEVERE ANEMIA

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Jessica Plazas, BS, Philip Efron, MD*, Alicia M. Mohr, MD*
University of Florida

Presenter: Elizabeth S. Miller, MD

Objectives: To analyze traumatic injury by injury severity score and compare to elective hip repair, as a transient injury, and healthy control with the hypothesis that more severe injury would lead to an increase in neuroendocrine activation, systemic inflammation and severe anemia.

Methods: An observational cohort study comparing blunt trauma patients (n=45), hip repair patients (n=26), and healthy controls (n=8) was performed at a level one trauma center. Bone marrow and plasma were obtained at the index operation. Injury severity score (ISS) ranged from 4 to 41 with a mean of 21. The trauma group was broken down into quartiles for analysis (Table). Data presented as mean±SD; *$p < 0.05$ vs. healthy control and **bolded** values $p < 0.05$ vs hip repair by Sidak's multiple comparisons test.

Results: Plasma norepinephrine increased as ISS increased, reaching its peak concentration in the highest ISS group. Plasma tumor necrosis factor alpha (TNF-α) and interleukin 6 (IL-6) concentration, and bone marrow erythropoietin expression reached their peak in the ISS 27-41 group and were significantly increased compared to the hip repair and healthy control group. Plasma C-reactive protein (CRP) was significantly increased in all trauma groups compared to both hip repair and healthy control. Bone marrow transferrin expression was significantly decreased in all trauma groups compared to hip repair. Hemoglobin significantly decreased and packed red blood cell (pRBC) transfusion sequentially increased as ISS increased.

Conclusions: As injury severity increased, the degree of neuroendocrine activation and systemic inflammation also increased and were associated with severe anemia despite more frequent transfusions. Elevation of bone marrow erythropoietin expression did not correct severe anemia in the most injured patients. Therefore, it is unlikely that exogenous erythropoietin administration alone will improve injury-associated anemia.

	Healthy Control	Hip Repair	ISS 4-13	ISS 14-20	ISS 21-26	ISS 27-41
IL-6 (pg/ml)	1.5 ± 0.4	3.8 ± 2.2	67.3 ± 26.7	**91.9 ± 51.1**	**86.2 ± 67.4**	**107.7 ± 80.4***
TNF-α (pg/ml)	1.2 ± 0.7	3.1 ± 2.4	3.9 ± 1.9	7.1 ± 3.6*	6.5 ± 4.1	**7.8 ± 3.1***
CRP (ng/ml)	2612 ± 1240	3907 ± 1317	**6034 ± 1034***	**5784 ± 1424***	**6492 ± 163***	**6457 ± 136***
NE (pg/ml)	256 ± 19	372 ± 241	382 ± 164	417 ± 181	476 ± 161	656 ± 240
Transferrin (mRNA Fold Change)	1.0 ± 0.0	2.0 ± 1.3*	**0.1 ± 0.1**	**0.3 ± 0.3**	**0.5 ± 0.3**	**0.6 ± 0.3**
EPO (mRNA Fold Change)	1.0 ± 0.0	3.9 ± 5.1	3.2 ± 2.3	5.6 ± 4.4	9.9 ± 11.1	**16.7 ± 18.7***

Plasma ELISA and Bone Marrow PCR of Trauma, Hip Repair and Healthy Control Patients

	Healthy Control	Hip Repair	ISS 4-13	ISS 14-20	ISS 21-26	ISS 27-41
Age		63 ± 11	44 ± 9	51± 20	**45 ± 14**	**33 ± 16**
Hemoglobin		13.7 ± 1.1	12.7 ± 1.3	**10.0 ± 1.8**	**8.2 ± 1.2**	**8.6 ± 0.9**
pRBC Transfusion		0.0 ± 0.0	0.5 ± 0.9	0.9 ± 1.8	**1.4 ± 1.4**	**1.9 ± 1.7**
HLOS (days)		2 ± 1	**8 ± 7**	**14 ± 5**	**16 ± 8**	**12 ± 6**
ICU LOS (days)		0.0 ± 0.0	1 ± 2	**6 ± 7**	**9 ± 9**	**6 ± 2**

Outcome Analysis of Trauma and Hip Repair Patients

Quick Shot Paper #21
January 17, 2019
5:00 pm

PLATELET INHIBITION IN SEVERELY-INJURED CHILDREN IS ASSOCIATED WITH TRAUMATIC BRAIN INJURY

Christine M. Leeper, MD, Stephen Strotmeyer, PhD,
Matthew D. Neal, MD, Timothy Billiar, MD, Barbara A. Gaines, MD*
Children's Hospital of Pittsburgh of UPMC

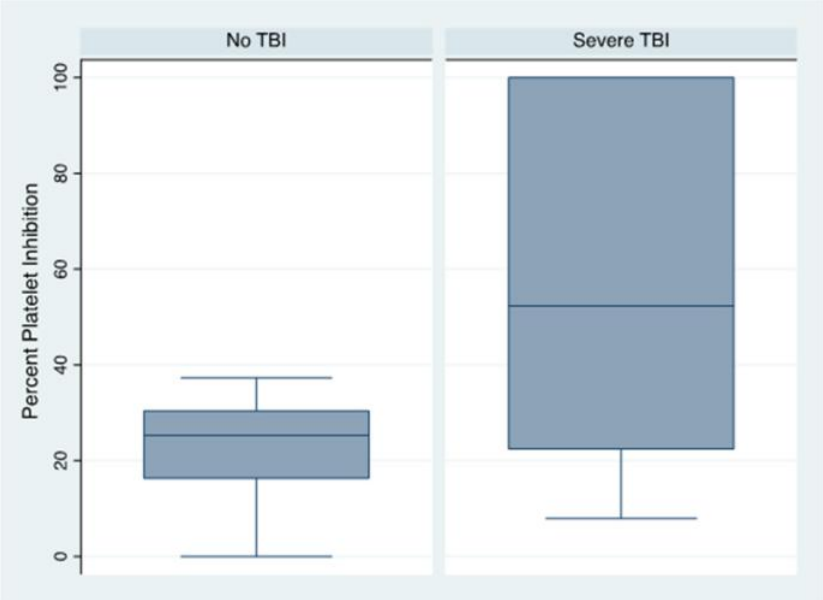
Presenter: Christine M. Leeper, MD

Objectives: The contribution of platelet dysfunction to trauma-induced coagulopathy is clearly established in adults. Previous studies in severely-injured children identify coagulation and hemostatic derangement after injury, however platelet function has not been well evaluated.

Methods: Prospective observational study of severely-injured children age<18 admitted to the intensive care unit. AA and ADP inhibition on TEG platelet mapping assay were calculated. Additional data collected included platelet count, thromboelastography values, injuries and severity scores. AIS score≥3 defined severe traumatic brain injury. Patient outcomes included mortality, functional disability at discharge, and length of stay.

Results: 28 patients were included: median(IQR) age=10(7-13), 85% male, injury severity score=17(11-30), 78% blunt mechanism, 60% severe TBI, 14% mortality, 19% functional disability. No patient was on antiplatelet medication or preexisting coagulopathy. For the whole cohort, inhibition at the AA receptor was median(IQR) = 13% (8-41), and at the ADP receptor was 30% (19-67). On univariate analysis, patients with severe TBI had significantly increased platelet inhibition at the ADP receptor as compared to those without TBI (median(IQR) 52% (21-100) versus 21% (1-31), p=0.0234) (Figure). Platelet inhibition did not correlate with platelet counts (p=0.45), which were all in the normal range, nor with rTEG-MA (p=0.41). Platelet inhibition was not associated with injury severity score (p=0.239) or clinical outcomes (all p>0.12).

Conclusions: Platelet function, based on TEG platelet mapping, is deranged in children after injury in the setting of normal platelet count. Traumatic brain injury is associated with increased platelet inhibition as compared to non-head injured children; injury severity alone is not. Larger cohorts are necessary to investigate the mechanism and relationship of platelet dysfunction with outcomes.


No TBI
Severe TBI
Percent Platelet Inhibition
0
20
40
60
80
100

Quick Shot Paper #22
January 17, 2019
5:06 pm

CRITICAL TRAUMATIC BRAIN INJURY IS ASSOCIATED WITH WORSE COAGULOPATHY

Daniel Cucher, MD, MS*, Deborah M. Stein, MD, MPH, FACS, FCCM*
University of Maryland Shock Trauma Center

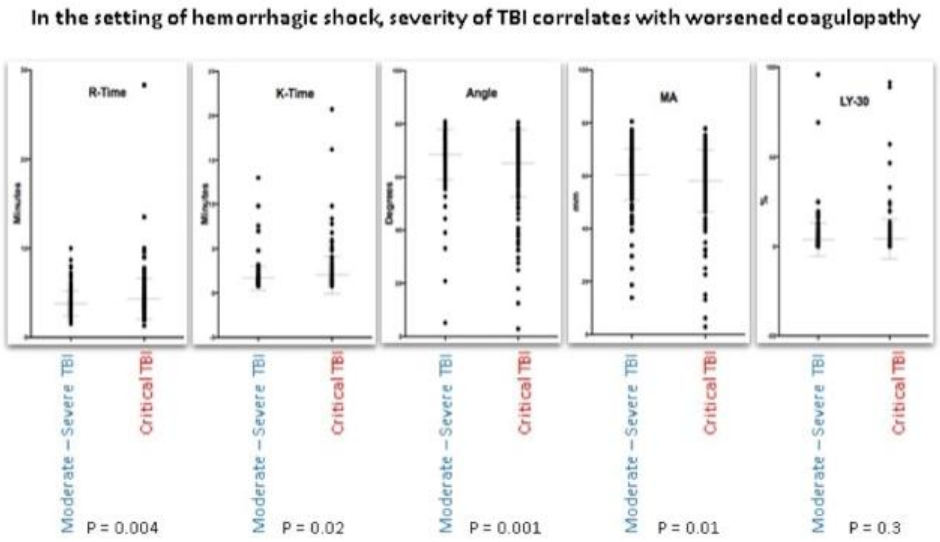
Presenter: Daniel Cucher, MD, MS

Objectives: As thromboelastography becomes the standard of care in patients with hemorrhagic shock, an association between concomitant TBI and coagulopathy by TEG parameters is not well understood and is thus investigated.

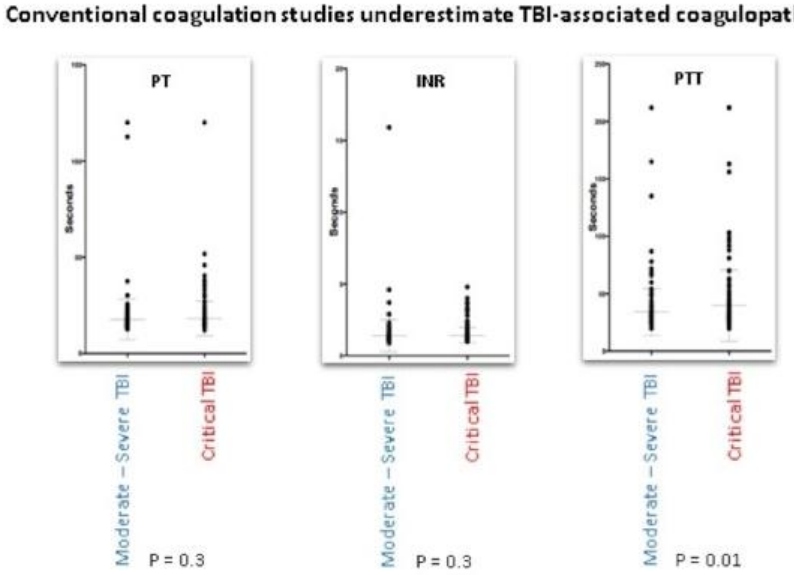
Methods: Retrospective analysis of trauma registry data at a single level 1 trauma center of 772 patients admitted with head AIS = 3 and TEG studies between 2014 - 2017. Patients were stratified to moderate-severe TBI by head AIS 3 - 4 (435 patients), and critical TBI by head AIS = 5 (328 patients). Hemorrhagic shock (HS) was defined by base deficit = 4 or shock index = 0.9. Statistical analysis with unpaired t-tests compared patients with critical TBI to patients with moderate-severe TBI, and patients were grouped by presence or absence of HS. A comparison of TBI data to conventional coagulation studies was also evaluated.

Results: In the setting of HS, critical TBI versus moderate-severe TBI was associated with longer R-time ($p = 0.004$), longer K-time ($p < 0.05$), less acute angle ($p = 0.001$), lower MA ($p = 0.01$). Worse TBI did not correlate with increased fibrinolysis by LY-30 ($p = 0.3$). PT/INR failed to demonstrate more severe coagulopathy, while PTT was found to correlate with severity of TBI ($p = 0.01$). In patients with critical TBI, the presence of HS correlated with a statistically significant worsening of all parameters ($p < 0.05$) except for LY-30.

Conclusions: TEG demonstrates that with and without hemorrhagic shock, more severe TBI correlates with a significant worsening of traumatic coagulopathy. In HS, critical TBI correlates with impaired clot initiation, impaired clot kinetics, and impaired platelet-associated clot strength and stability versus parameters found in moderate-severe TBI. HS correlates with worse traumatic coagulopathy in all evaluated patient groups with TBI. Conventional coagulation studies underestimate TBI-associated coagulopathy. TBI-associated coagulopathy is not associated with fibrinolysis.



Scatter plots demonstrating worsening of TEG parameters with more severe TBI



Scatter plots demonstrating underestimation of TBI-associated coagulopathy by conventional coagulation studies

Quick Shot Paper #23
January 17, 2019
5:12 pm

ABDOMINAL SEATBELT SIGN: EXCLUSION OF HOLLOW VISCOUS INJURY IS EASIER THAN PREDICTION

Patrick Delaplain, MD, Cristobal Barrios, MD*, Dean Spencer, BS,
Michael Lekawa, MD, Sebastian Schubl, MD*, Areg Grigorian, MD,
Austin Dosch, MD, Marija Pejcinovska, Jeffry Nahmias, MD, MHPE, FACS*
University of California, Irvine

Presenter: Patrick Delaplain, MD

Objectives: Guidelines surrounding abdominal seat belt sign (SBS) were made prior to the use of modern CT scanners. We hypothesized that, in the absence of imaging findings, SBS would not be predictive of hollow viscous injury (HVI). Furthermore, we aimed to design a model to accurately predict the presence of HVI.

Methods: A prospective cohort of patients with SBS was compiled over one year. Subjects were divided into those with and without HVI. Descriptive statistics (Chi-square and t-test) were used to compare covariates. A logistic regression was performed to determine associations between covariates and HVI. A predictive model attempting to incorporate vital signs, physical exam, laboratory values and imaging findings was designed using the Lasso procedure.

Results: Of 223 patients with SBS, the incidence of HVI was 6.7% (N=15). Radiographic findings had the highest correlation with HVI (Table 1) and no patients with a negative CT scan had HVI. Free fluid was seen in 80% (12) of patients with HVI, whereas it was found in only 11% (23) without injury. The Lasso procedure identified max heart rate, guarding, FAST scan, initial WBC and CT findings (free fluid, bowel wall thickening, mesenteric stranding, free air) as the most predictive factors for HVI. Our predictive model produced the following parameters: accuracy rate: 0.96 (CI: 0.87-0.99); sensitivity: 0.5; specificity: 1; PPV: 1; NPV: 0.95.

Conclusions: The incidence of HVI with SBS is lower than previously suspected. While no constellation of findings acted as a sufficient predictor for HVI, no patients in our study with negative CT imaging required an operation for HVI--suggesting there is a population of patients with SBS that could be discharged from the emergency room. Strict adherence to EAST guidelines regarding free fluid in the presence of SBS would have resulted in a 65% negative intervention rate. A prospective multicenter study is needed to confirm these findings.

	OR	(95% CI)	P-Value
Radiographic SBS	3.44	(0.76 - 15.69)	0.729
Free fluid	31.65	(8.31 - 120.57)	< 0.001
Bowel Wall Thickening	14.07	(4.37 - 45.34)	< 0.001
Mesenteric Stranding	24.89	(7.39 - 83.85)	< 0.001
Bowel Dilatation	7.73	(1.29 - 46.19)	0.274
Free Air	160.83	(15.74 - 21,808)	< 0.0001

Table 1: Association between radiographic findings and presence of HVI.

Quick Shot Paper #24
January 17, 2019
5:18 pm

SAVE 2.0: SIMULATION TEAM-TRAINING FOR PENETRATING INJURIES

Emily J. Onufer, MD, MPH, Darren Cullinan, MD, Jason A. Snyder, MD*, Kelly Vallar, Isaiah Turnbull, MD, PhD, Douglas J.E. Schuerer, MD, FACS*, Grant V. Bochicchio, MD, MPH*, Paul Wise, MD, Mary Klingensmith, MD, Laurie Punch, MD*
Washington University in St. Louis

Presenter: Emily J. Onufer, MD, MPH

Objectives: The Surgery for Abdomino-thoracic ViolencE (SAVE) animate lab engages surgical residents in managing penetrating injuries, particularly by firearms, in a team setting. Senior residents (SR; PGY3-5) assume the team leader (TL) role, facilitating junior residents (PGY1-2) in operative management of simulated gunshot wounds. Teams complete five scenarios of increasing difficulty within set time limits. SRs are evaluated on their team's ability to "SAVE" their patient within the time allotted as well as their communication and leadership skills. The SR with the highest leadership score (LS) and fastest time given years of clinical experience (CE) receives the Lebsche Award. We hypothesized teams and TLs with the most CE would perform best.

Methods: Surgery residents (n=79) were divided into teams of 3-4 by resident-scores (R-scores, the sum of the team members' clinical year) to create balanced teams of comparable CE. Residents completed validated assessments of their TL's ability. Time to complete each scenario was recorded.

Results: R-scores were 6, 7, and 8 with 11, 9, and 5 teams, respectively. Seven SRs had a LS of 9/10, representing all 3 R-scores (R-score 6: 2, R-score 7: 3, R-score 8: 1). Multiple teams completed all scenarios in under 80 minutes (R-score 6: 1, R-score 7: 2, R-score 8: 2). Lebsche award finalists (outlined in Figure) included those with the best time and highest LS while accounting for their team's R-score. The TL with an R-score of 6, who had the highest LS and third fastest time overall, won the award.

Conclusions: Contrary to our hypothesis, CE did not define differences between TL success. Leadership is a powerful influence on team performance and can transcend overall CE. Team dynamics are an important factor in stressful clinical scenarios, such as those presenting in the management of gun violence. Enhancement of leadership skills early in residency training is an important focus for trauma surgery education.

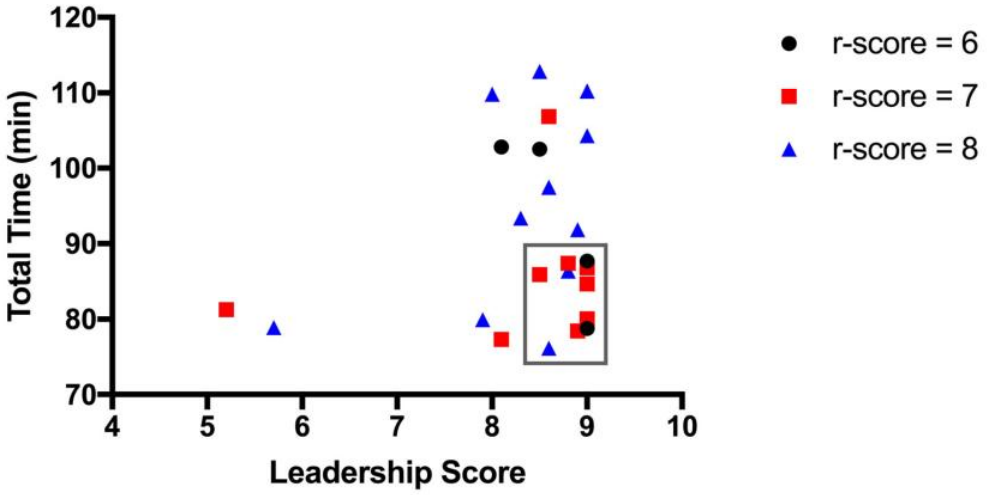


Figure. Senior resident (n=22) performance as evaluated by leadership assessment (from 1-10) and total time to complete SAVE lab (in minutes) by R-score.

Quick Shot Paper #25
January 17, 2019
5:24 pm

INJURIES RESULTING FROM "AIR GUNS" AT FIVE PEDIATRIC LEVEL I TRAUMA CENTERS

Nadja Apelt, MD, Jefferson Tweed, MS, Cynthia Greenwell, RN,
David M. Notrica, MD, Todd Maxson, MD, Nilda Garcia, MD*,
James W. Eubanks III (Trey), MD*, Robert W. Letton Jr., MD*, David Schindel, MD
Children's Medical Center Dallas

Presenter: Nadja Apelt, MD

Objectives: Every year, approximately 100,000 Americans fall victim to gun violence; 38% are aged <19 years. Conversely, 67% of accidental injuries by non-powder guns (NPG) are sustained in the pediatric population. While often considered to be comparatively less dangerous, modern NPGs easily achieve the same projectile velocities as firearms. We hypothesized that the risk of injuries in children is thus significant and underappreciated.

Methods: 1/1/2007 to 12/31/2016, we examined NPG injuries across 6 Pediatric Level I Trauma Centers (ATOMAC consortium). NPG injuries were defined as injuries sustained by BB or pellet, either metallic or plastic, which are fired by an air powered gun. Paint ball and soft foam projectiles were excluded. Following IRB approval, retrospective chart review examined demographic data, injury severity scores (ISS), length of stay (LOS), outcome at discharge, and overall cost of admission for patients <19 years. Descriptive statistics and parametric tests were employed as appropriate.

Results: A total 499 patients sustained 565 injuries. Mean age was 9.5 (± 4.0) years; 82% of victims were male. All survived to hospital discharge. 30% (n=151) required operative intervention. Hospital LOS was 2.3 (± 2.2) days; with average cost of $23,756 (± $34,441). ISS averaged 3.7 (± 4.6) on admission. Over 40% of the injuries that occurred to the head or thorax were severe (AIS^3 3) and were associated with a need for operative intervention ($p < 0.001$). Trauma registry data did not allow for sub-classification of injury pattern by NPG type. NPG injuries accounted for 0.6% of pediatric trauma patients and this proportion remained unchanged throughout the study period.

Conclusions: Modern NPGs cause severe injuries that required admission, or operative intervention in children. The morbidity, cost and psychologic impact of these injuries is considerable. Further study on injury prevention and safety of NPGs is necessary.

Quick Shot Paper #26
January 17, 2019
5:30 pm

USE OF HELICOPTERS FOR RETRIEVAL OF TRAUMA PATIENTS: A GEOSPATIAL ANALYSIS

Weston A. Smedley, BSc, K. Lorraine Stone, Paige Farley,
Allison K. Brown, MD, Russell Griffin, PhD,
Jeffrey D. Kerby, MD, PhD*, Patrick L. Bosarge, MD*, Jan Jansen, MBBS, PhD
University of Alabama in Birmingham

Presenter: Weston A. Smedley, BSc

Objectives: Helicopters are widely used to facilitate the transport of trauma patients, from the scene of an incident, to hospital. However, the use of helicopters is expensive. The aim of this project was to conduct a geospatial analysis of helicopter transport in our area, in order to determine whether helicopters are used efficiently.

Methods: Retrospective geospatial analysis of trauma registry data, 2013-2018. We included all adult (≥16) trauma patients brought to the trauma center directly from the scene. Data were geocoded and analyzed using arcGIS™. Drive-times and flight-times were calculated using Google Maps. Flight-times included the time required to reach the incident location.

Results: 2893 patients were identified. 1911 had incident locations recorded, and were therefore included in the analysis. The median age was 41 years (IQR 27-57). 24% of patients had suffered severe injuries (ISS16-25), 17% very severe injuries (ISS>25), 24% moderately severe injuries, and 35% minor injuries (ISS 1-8). The overall geographical distribution (fig 1) was centroidal, although with a concentration of case volume in the vicinity, and to the North-East, of the trauma center. Median flight time was 58 mins (IQR 51-66), and median drive time 65 mins (IQR54-86). In 28% of patients, the calculated drive-time to the trauma center was shorter than the calculated flight-time, when considering the time for the helicopter to reach the scene.

Conclusions: The majority of patients taken to our level I trauma center by helicopter are injured in relatively close proximity. Overall case volume parallels population distribution. One-in-four patients are severely or very severely injured, but one-third of patients have only minor injuries. Over a quarter of trauma patients might have reached hospital more quickly if they had been taken by road, rather than helicopter. These findings warrant further investigation.

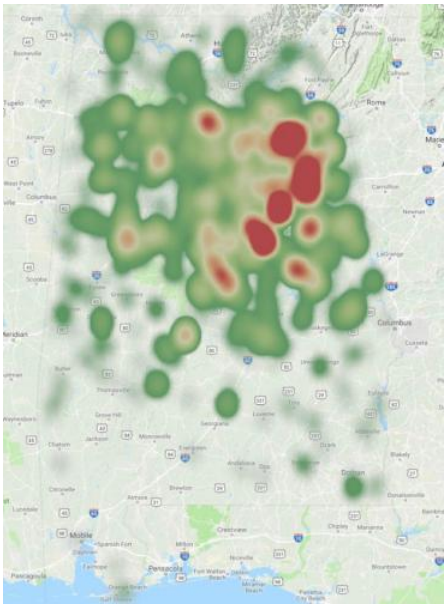


Figure 1: Kernel Density Estimate map ("heat map") of incident locations requiring helicopter transport

Quick Shots Parallel Session III

Quick Shot Paper #27
January 17, 2019
5:36 pm

UNPLANNED READMISSION AFTER TRAUMATIC INJURY: A LONG-TERM NATIONWIDE ANALYSIS

Nicole Lunardi, MSPH, Ambar Mehta, MPH, Sanskriti Varma, BS,
Robert D. Winfield, MD, FACS*, Alistair J. Kent, MD, MPH*,
Joseph K. Canner, MHS, Avery B. Nathens, MD, PhD, MPH*, Bellal Joseph, MD*,
David T. Efron, MD*, Joseph V. Sakran, MD, MPH, MPA, FACS*
Johns Hopkins School of Medicine

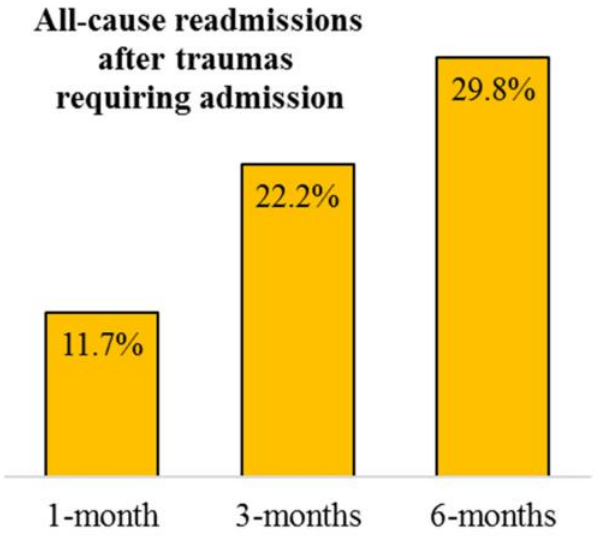
Presenter: Hiba Ezzeddine, MD

Objectives: Long-term outcomes after trauma admissions remains understudied. We analyzed the characteristics of inpatient readmissions within 6-months of an index hospitalization for traumatic injury.

Methods: Using the 2010-2015 Nationwide Readmissions Database, which captures data from up to 27 U.S. States, we identified patients at least 15-years-old admitted to a hospital through an emergency department for blunt trauma, penetrating trauma, or burns. Exclusion criteria included hospital transfers, patients who died during their index hospitalizations, and hospitals with fewer than 100 trauma patients annually. After calculating the incidences of all-cause, unplanned inpatient readmissions within 1-, 3-, and 6-months, we used multivariable logistic regressions to identify predictors of readmissions. Analyses adjusted for patient factors, clinical factors, and hospital clustering.

Results: Among 3,002,176 patients experiencing trauma, the majority were for blunt trauma (92.6%), followed by penetrating trauma (6.2%) and burns (1.5%). Overall rates of inpatient readmissions were 9.9% within 1-month, 19.5% within 3-months, and 26.0% within 6-months (Figure), with limited variability by year. These rates remained similar when stratifying patients by specific mechanisms of trauma. After adjustment, the following were associated with all-cause 30-day inpatient readmissions: male gender (OR 1.16 [95%-CI 1.15-1.17]), lowest quartile of income (1.04 [1.02-1.05]), number of comorbidities (1.17 [1.16-1.18]), leaving against medical advice (2.32 [2.25-2.41]), and private hospitals (1.17 [1.14-1.20]).

Conclusions: Unplanned readmission after trauma is high and remains this way 6 months after discharge. Understanding the factors that lead to high rates of all-cause readmissions within 1-, 3-, and 6-months offer a focus area for quality improvement and have important implications for hospital benchmarking endeavors.


All-cause readmissions after traumas requiring admission
11.7%
22.2%
29.8%
1-month
3-months
6-months

Quick Shot Paper #28
January 17, 2019
5:42 pm

RISK FACTORS FOR INTENSIVE CARE UNIT ADMISSION FOR TRAUMA PATIENTS ADMITTED TO THE FLOOR: A TQIP ANALYSIS

Michael Mazzei, MD, MS, Zoe Maher, MD*, Elizabeth Dauer, MD*,
Leonard Mason, MD*, Jessica H. Beard, MD, MPH*, Thomas A. Santora, MD*,
Amy J. Goldberg, MD*, Lars Ola Sjoholm, MD*, Abhijit S. Pathak, MD*
Temple University School of Medicine

Presenter: Michael Mazzei, MD, MS

Objectives: For trauma patients, unplanned ICU transfer after floor hospitalization is associated with increased mortality, and patients admitted to the ICU from general medical floors have worse outcomes than those admitted directly from the emergency department (ED). Appropriate initial placement of trauma patients is an important goal in the mitigation of poor outcomes. The objective of this study was to identify the risk factors associated with ICU admission for trauma patients initially admitted to the general floor.

Methods: All patients from 2013-2016 in the Trauma Quality Improvement Program (TQIP) database who were initially admitted to the floor were evaluated. Cormorbidities, injury patterns, and presentation findings were analyzed via univariate analysis and multivariate logistic regression in order to determine risk factors for ICU admission.

Results: Of the 293,582 patients who were initially admitted to the general floor from the ED, 23,476 (7.99%) were admitted to the ICU during their hospital stay. Of these, 3,353 (14.28%) were considered unplanned ICU admissions. On multivariate regression, higher ISS (OR 1.051. $p > 0.001$), older age (OR 1.002/yr, $p > 0.001$), and decreased presenting GCS (OR=0.87, $p<0.001$) were most strongly associated with increased rates of ICU admission from the floor. The most predictive comorbid conditions included CHF (OR=1.85, $p<0.001$), COPD (OR=1.48, $p<0.001$), CKD (OR=1.45, $p<0.001$), and alcoholism (OR=1.43, $p<0.001$). Mean hospital length of stay (13.7 vs 5.6, $p<0.001$) and in-hospital mortality (7.79% vs 0.63%, $p<0.001$) were significantly higher among those trauma floor patients requiring admission to the ICU.

Conclusions: Presenting factors and comorbid conditions may be identified at trauma activation that predispose patients to ICU admission from the floor, which in turn is associated with greater hospital length of stay and mortality. Early identification of these risk factors will highlight those trauma patients most likely to benefit from closer observation.

Quick Shot Paper #29
January 17, 2019
5:48 pm

EFFECT OF HEMORRHAGE CONTROL ADJUNCTS IN SEVERE PELVIC FRACTURE: A MULTI-INSTITUTIONAL STUDY

Juan C. Duchesne, MD, FACS, FCCP, FCCM*, Todd Costantini, MD, FACS, Ethan Taub, DO, Brandon Behrens, MD, Robert D. Winfield, MD, FACS*, Jason L. Sperry, MD, MPH*, Shariq Raza, MD, Nicholas Namias, MBA, MD*, Rebecca W Schroll, MD*, Patrick McGrew, MD*, Clifton McGinness, MD, Benjamin Martinez, MD, Danielle Tatum, PhD
Tulane University School of Medicine

Presenter: Juan C. Duchesne, MD, FACS, FCCP, FCCM

Objectives: Hemodynamically unstable patients with severe pelvic fracture can be of significant challenge. Despite trauma national guidelines, variability in hemorrhage control adjuncts for severe pelvic bleeding still exist. However, the effect of these methods on time to definitive bleeding control, type of resuscitation given, and outcomes remains unknown. We sought to elucidate those effects.

Methods: This was a multicenter retrospective review of severe pelvic fracture patients in shock between 2011-2016. Shock was defined as systolic blood pressure <90 mmHg, heart rate >120 beats per minute, or base deficit < -5. Definitive bleeding control was defined as time to surgical control in the operating room (OR) or angioembolization by interventional radiology (IR). Significance level was $P < 0.05$.

Results: A total of 182 severe pelvic fracture patients with shock on admission from 8 trauma centers were included. The cohort was primarily male (64%) with median (IQR) age of 42 (28, 54), ISS of 35 (27, 48), GCS of 12 (3, 15), and overall mortality of 32%. The most common modality was pelvic binder (45%) followed by no adjunct (33%); least common was external fixator alone (4%). REBOA was most often used along with pre-peritoneal packing (PPP) (58%). PPP alone and REBOA alone/with other adjunct resulted in faster time to OR/IR but had the highest blood utilization and mortality rates.

Conclusions: Marked variation in management of severe pelvic fracture patients in shock indicates the need for a standardized approach to maximize outcomes and minimize transfusion requirements. The use of PPP &/or REBOA yielded fastest times to definitive bleeding control; yet, REBOA continues to be infrequently used in these patients. Future analysis of this combination needs further validation in patients with severe pelvic hemorrhage.

	N	Pelvic binder alone	Ex fix alone	PPP alone	REBOA alone or with other	Binder with other	No adjunct	P
ISS ≥ 25	**n = 153**	**n = 56**	**n = 3**	**n =21**	**n = 12**	**n = 12**	**n = 49**	
Age†	42 (28,55)	41 (30,59)	34 (26,34)	36 (26,57)	46 (29,66)	37 (28,46)	47 (28,57)	NS
ISS†	41 (30,49)	38 (29,50)	48 (33,48)	43 (38,50)	43 (39,47)	35 (25,43)	36 (29,50)	NS
SBP (mmHg)†	84 (70,100)	86 (73,116)	82 (0,82)	64 (45,76)	85 (60,90)	88 (80 ,103)	87 (79,100)	**
Base deficit†	-10 (-6, -14)	-9.4 (-6 , -12)	-10 (-10, -11)	-19.0 (-11, -22)	-14.0 (-8.5, -15.8)	-8.0 (-7, -15.5)	-9.0 (-6, -13)	**
INR†	1.35 (1.1,1.77)	1.2 (1.0,1.7)	1.63 (1.25,1.63)	1.5 (1.2,2.0)	1.52 (1.43,1.75)	1.4 (1.06,2.15)	1.23 (1.1,1.76)	NS
PRBC†	8 (4,19)	7 (3,14)	9 (6,9)	24 (9,48)	27 (21,33)	19 (9,34)	5 (3,11)	**
OR vs IR‡								
OR	81 (53)	28 (50)	3 (100)	14 (67)	5 (42)	4 (33)	27 (55)	*
IR	51 (33)	19 (34)	-	7 (33)	7 (58)	8 (67)	10 (20)	
Neither	10 (7)	3 (5)	-	-	-	-	7 (14)	
Died in ED	11 (7)	6 (11)	-	-	-	-	5 (10)	
Time to bleeding control (hours)†	2 (0.75,3.5)	2.5 (1.2,4.4)	4 (3.3,4)	0.5 (0.25,1.75)	0.8 (0.5,1.5)	1.9 (0.5,2.2)	2.5 (1,4.25)	**
Mortality‡	55 (36)	12 (21)	-	13 (62)	9 (75)	4 (33)	17 (35)	**
Time to death (days)	1 (1,4)	1 (1,2.5)	-	1 (1,3.5)	1 (1,2.5)	1.5 (1,5)	2.8 (1,11)	NS

† denotes median (IQR 25, 75). ‡ denotes frequency as n (%). ISS – Injury Severity Score; SBP – systolic blood pressure; HR – heart rate; bpm – beats per minute; PTT – partial thromboplastin time; INR – international normalized ratio; PRBC – packed red blood cells; ED – emergency department.

* indicates significance at the $P < 0.05$ level. ** indicates significance at the $P \leq 0.001$ level.

Quick Shot Paper #30
January 17, 2019
5:54 pm

INTEGRATING COMORBIDITIES IN TRAUMA INJURY SEVERITY SCORING SYSTEM: DOES IT MATTER?

Adel Elkbuli, MD, MPH *, Mark G. McKenney, MD*,
Dessy Boneva, MD, FACS, Shaikh A. Hai, MD, FACS*
Kendall Regional Medical Center

Presenter: Adel Elkbuli, MD, MPH

Objectives: The Revised Trauma Score combined with the Injury Severity Score (ISS) remains the mostly commonly used system for predicting trauma mortality, but this scoring systems does not account for the patient's comorbidities. The purpose of this study is to evaluate the effect of comorbidities on ISS related morality and length of stay (LOS).

Methods: Three-year review of our trauma registry. Patients were divided by ISS into two groups: ISS=1-15, and ISS> 15. Each ISS group was then subdivided by number of comorbidities, 1-2, and ≥3. Demographic characteristics, mechanism, outcome measures including death and LOS were compared. Chi Squared and t-test were used with significance defined as $p<0.05$.

Results: A total 9,845 trauma patients were studied. In the ISS=1-15 group, patients with ≥3 comorbidities had significantly higher mortality rate compared to the ISS=1-15 with 1-2 comorbidities (4.0% vs 0.3%,$p<0.00002$). Comparing the ISS> 15 patients with ≥3 comorbidities to the ISS> 15 with 1-2 comorbidities the mortality rate was significantly higher (33% vs 7%, $p<0.00006$). The ICU-LOS was significantly higher in the ISS 1-15 group with ≥3 comorbidities vs 1-2 (17 vs 10 days, $p<0.05$) but not in the ISS> 15 groups (31 vs 29 days) ($p>0.05$).

Conclusions: With similarly injured patients increased comorbidities is associated with a significantly higher mortality indicating that increased number of comorbidities may serve as a marker of lower physiologic reserve and be an independent variable. Adding comorbidity parameters to the current trauma scoring systems can be assist in predicting more accurate/reliable outcomes.

Quick Shot Paper #31
January 17, 2019
6:00 pm

ELECTRONIC MONITORING OF PRACTICE MANAGEMENT GUIDELINES: THE FUTURE OF COMPLIANCE

Abby McCall, PA-C, Amanda McNicholas, RN, MSN, CRNP*,
Eugene F. Reilly, MD*, Anthony Martin, RN, Shannon Marie Foster, MD, FACS*
Reading Hospital

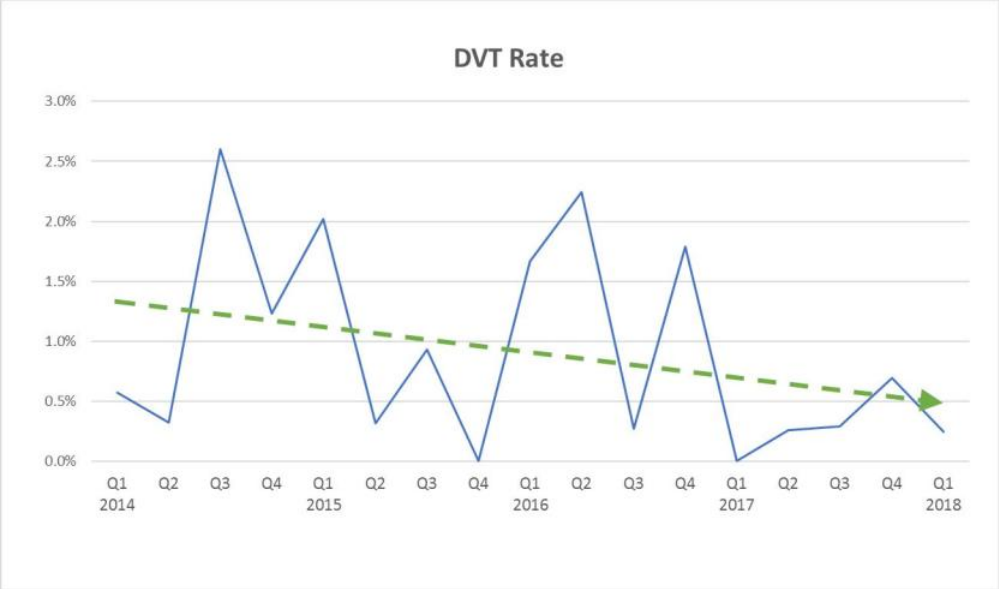
Presenter: Abby McCall, PA-C

Objectives: Trauma systems across the country are held to high standards related to quality, and accrediting bodies require a robust tracking system of compliance with evidenced-based practice management guidelines (PMGs). Historically, this was a laborious task that was performed by human data abstraction in a retrospective fashion. In the era of the electronic medical records (EMRs), PMG tracking should ideally be performed concurrently, where the ability to make changes in real time could affect patient outcomes. In addition, it was hypothesized that real-time monitoring would decrease deep venous thromboembolism (DVT) occurrence.

Methods: Utilizing our EMR, flowsheets were created to implement a quarterly monitoring process for PMGs, one of which was DVT prophylaxis. Specific clinical questions were created to then calculate compliance. During daily clinical rounds, advanced practice providers (APPs) utilize these flowsheets to input data for each trauma patient. The data is exported into an Excel document via the statistical data platform, WebFocus, allowing for both an active and retroactive query. Formulas within Excel were then created to calculate compliance based upon the answers documented in the flowsheets. Monthly compliance rates were reported and compared over time.

Results: We have tracked our DVT rates and benchmarked them against state and national averages. A comparison of DVT rates from 2013 to the present was performed. Following the implementation of electronic PMG tracking, our DVT rate has trended below our state's average for the last 5 quarters and has remained below that average.

Conclusions: Utilization of flowsheets is an effective method to monitor PMGs within the EMR platform, that also allows for transparency of accurate calculation of compliance. This real-time compliance tracking has improved the quality of care delivery, as evidenced by a decreased trend in DVT rate at our institution.


DVT Rate
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
Q1 2014
Q2
Q3
Q4
Q1 2015
Q2
Q3
Q4
Q1 2016
Q2
Q3
Q4
Q1 2017
Q2
Q3
Q4
Q1 2018

Quick Shot Paper #32
January 17, 2019
6:06 pm

EXPRESSION OF HIGH MOBILITY GROUP BOX 1 PROTEIN IN A POLYTRAUMA MODEL TREATED WITH ECLS AT GROUND LEVEL AND HIGH ALTITUDE

Jae H. Choi, PhD, DVSc, Teryn Roberts, Kyle Sieck,
George Harea, Vitali Karaliou, MD, Daniel Wendorff, Brendan Beely,
Leopoldo C. Cancio, MD, FACS*, Valerie Sams, MD*, Andriy Batchinsky, MD
The Geneva Foundation

Presenter: Jae H. Choi, PhD, DVSc

Objectives: We investigated expression of HMGB1 and plasma free hemoglobin (pfHb) in a combat-relevant polytrauma/ARDS model of evacuation with ECLS. We hypothesized that HMGB1 expression in plasma would be increased after injury, and that exposure to high altitudes experienced during AE would increase expression.

Methods: Female Yorkshire swine (n = 15) were anesthetized and sedated. Animals were cannulated with a 23F dual lumen catheter and VV ECLS was initiated via right jugular vein. Heparin maintained ACT at 150% of BL on day 1 and was stopped prior to injury on day 2. Animals underwent a transport modeling a typical AE from the animal ICU to a flight profile consisting of 5k Ft, 8k Ft, 30k Ft altitudes on both days. Animals were maintained overnight under ICU care. On day 2, all animals received a bilateral pulmonary contusion (PC) before repeating transport. ELISA was utilized to analyze HMGB1 plasma concentration. pfHb was measured by Spectramax i3. Statistics by SAS Cary, NC, v. 9.4. Data are represented as mean +/- SEM, significance identified at $p<0.05$.

Results: Six animals died after injury and only completed Day 1 flight. In these animals, HMGB1 was higher at post-injury (PI) compared to the survivor group (110.2+/-45.7 ng/mL vs 45.1+/-9.6 ng/mL, $p<0.05$). pfHb differed between groups at PI (43.6+/-6.9 mg/dL vs 23.2+/-3.1 mg/dL, $p<0.001$), 30k ft (21.6+/-3.9 mg/dL vs 10.7+/-1.9 mg/dL, $p<0.05$), and Pre (39.1+/-4.8 mg/dL vs 26.1+/-4.2 mg/dL, $p<0.05$). pfHb increased for the non-survivor group from BL levels PI (43.6+/-6.9 mg/dL vs 24.0+/-5.0 mg/dL, $p<0.05$). Exposure to high altitude did not alter HMGB1 expression in uninjured state on ECLS. PC caused a transient increase in HMGB1.

Conclusions: Bedside assessment of HMGB1 and pfHb confirms injury and may provide a useful monitoring capability during en-route care and should be a part of precision medicine lab-on-a-chip type assays in the future.

Quick Shots Parallel Session IV

Quick Shot Paper #33
January 17, 2019
5:00 pm

PHENYLEPHRINE PROTECTS THE ENDOTHELIAL GLYCOCALYX IN A CELLULAR MODEL FOR SHOCK

Jessica Friedman, MD, Olan Jackson-Weaver, PhD,
Chrissy Guidry, MD*, Alison A. Smith, MD, PhD, Rebecca W. Schroll, MD*,
Juan C. Duchesne, MD, FACS, FCCP, FCCM*
Tulane University School of Medicine

Presenter: Jessica Friedman, MD

Objectives: Vascular endothelial cell (EC) damage is a hallmark of hemorrhagic shock and contributes to the coagulopathy seen in trauma patients. Endotheliopathy of trauma (EoT) is characterized by shedding of the endothelial glycocalyx (EG). The stimuli leading to EoT have not been fully elucidated; one proposed mechanism is that high circulating catecholamine levels may induce ECs to shed glycocalyx. Our objective was to examine the impact of catecholamine stimulation on ECs exposed to hypoxia, as a model for shock.

Methods: Human umbilical vein endothelial cells (HUVECs) were cultured to confluence and exposed to either 5% O_2 for 1 hr or 5% O_2 plus 100 mM phenylephrine (high-dose PE; HDPE). Following hypoxic exposure, cells underwent reoxygenation (ReOx) with 20% O_2 for 1 hr. During ReOx, some cells were exposed to either 10 mM PE (low-dose PE; LDPE), HDPE, or HDPE and inhibitors of either a_{1A}, a_{1B}, and a_{1D} receptor subtypes. EG was measured using fluorescently tagged wheat germ agglutinin and imaged with confocal microscopy.

Results: Hypoxia decreases EG thickness (Fig 1). This decrease was exacerbated by LDPE exposure (Fig 2A) and attenuated by HDPE exposure (Fig 1, Fig 2A). HDPE had the greatest protective effect if exposure occurred during hypoxia (Fig 2B). This protective effect was unchanged by inhibition of receptor subtypes a_{1B} and a_{1D} (data not shown) but was augmented by α_{1A} inhibition (Fig 1).

Conclusions: Our results indicate that HDPE exposure (α activation) does not induce/exacerbate EG shedding, as has been previously shown with epinephrine (α and β activation); on the contrary, it appears to be protective. Interestingly, LDPE exacerbated EG loss. The protective effect of HDPE was most pronounced if exposure occurs during hypoxia. Of the three receptor subtypes activated by PE, it appears that a_{1A} may actually oppose observed protective effects, as its inhibition resulted in augmented protection of the EG.

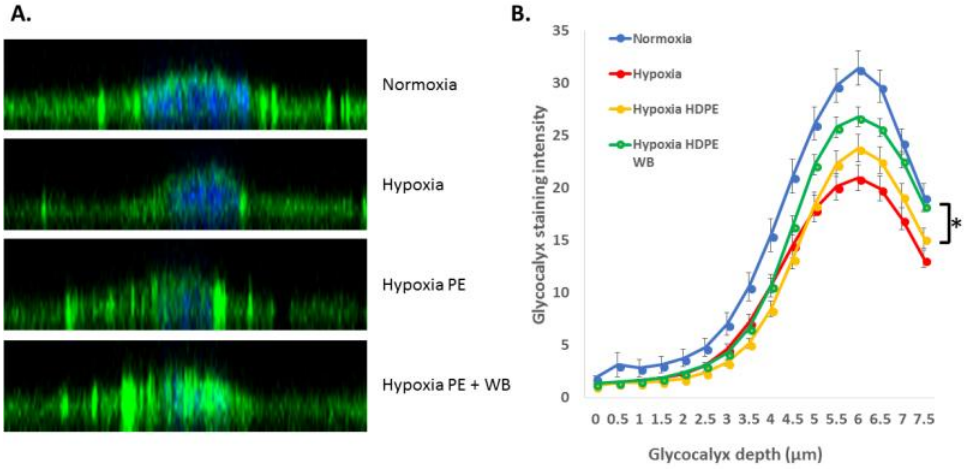


Fig. 1. Hypoxia causes glycocalyx loss in cultured HUVECs. **A**. Representative images of glycocalyx z-stacks in cross-section view. Glycocalyx in green, nuclei (DAPI) in blue. **B**. Quantification of glycocalyx density on apical surface of HUVECs. PE=100 μM phenylephrine, WB=1 μM WB4101 (α_{1A} adrenergic receptor antagonist). * p<0.05

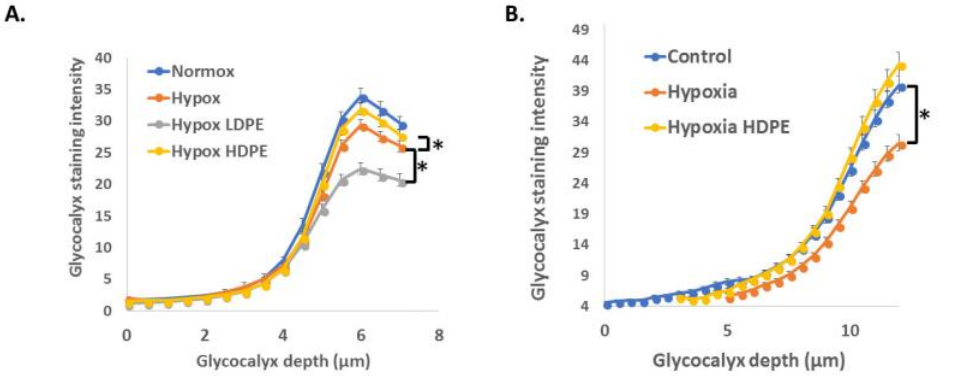


Fig. 2. Phenylephrine (PE) has a dose-dependent effect on glycocalyx. **A.** Low dose PE (10 μM) exacerbated glycocalyx loss while high dose PE (100 μM) restored glycocalyx when administered during the reoxygenation phase. **B.** High dose PE (100 μM) prevented any loss of glycocalyx when administered during both the 1 hour hypoxic exposure and 1 hour reoxygenation phases. * p<0.05

Quick Shot Paper #34
January 17, 2019
5:06 pm

DEVELOPMENT OF A CLINICAL TRACHEOSTOMY SCORE TO IDENTIFY SPINAL CORD INJURY PATIENTS REQUIRING PROLONGED VENTILATOR SUPPORT

Dane Scantling, DO, MPH, Teerin Meckmongkol, MD, PhD,
Amanda Teichman, MD, Brendan K. McCracken, MD*
Drexel University College of Medicine

Presenter: Dane Scantling, DO MPH

Objectives: Cervical spinal cord injuries (CSCI) often necessitate ventilator support (VS). Prolonged endotrachial tube use has conveyed substantial morbidity in prospective study. Tracheostomy is recommended if VS is anticipated to be =7 days. Identifying these patients on arrival and before tracheostomy need is readily evident could prevent morbidity while lowering hospital costs. We aimed to create a Clinical Tracheostomy Score to identify patients requiring =7 days of VS.

Methods: A review of patients with cervical spine fractures and CSCI from 2005 to 2014 from the Pennsylvania Trauma Outcome Study database was performed. Patients were excluded for missing data, no use of VS or death in <7 days. Logistic regression was used to identify independent predictors of prolonged VS. Baseline data on 37 risk factors were included in the logistic regression. p=0.05 was significant. A predictive model for =7 days of VS was established using univariate and multivariate logistical regression with Hosmer-Lemeshow goodness of fit testing.

Results: 770 patients were identified. 220 C1-C4 and 275 C5-7 CSCI patients were included. 3 factors were associated with =7 days VS: type of cord injury (TCI, p<0.001), highest cervical spine fracture level (HCFL, p=0.001), and AIS face (p=0.007). Our score was obtained from this equation: 4.138 - 0.981(TCI) - 0.344(HCFL) + 0.419(AIS face). TCI was complete = 1, anterior = 2 or central = 3. The equation positive predictive value for =7 days of VS is 82.3% for a score =1.

Conclusions: Use of the Clinical Tracheostomy Score identified the majority of patients requiring prolonged ventilator support in our study. An early tracheostomy protocol could, using predictive modeling, could aid in reduction of ICU length of stay and improving ventilator weaning in these patients. External verification of this predictive tool and of an early tracheostomy protocol is needed.

Quick Shot Paper #35
January 17, 2019
5:12 pm

A SYSTEMATIC APPROACH FOR TRAUMA TEAM MEMBERS (TTMS) TO COPE AFTER MASS CASUALTY INCIDENTS (MCIS)

Mayur Narayan, MD, MPH, MBA, MHPE, FACS, FCCM, FICS*,
Cara Berkowitz, BA, Swana De Gijsel, MD, Ellen Hawa, RN,
Christina Hollingsworth, RN, Robert Winchell, MD, Beth Lown, MD
NewYork-Presbyterian, Weill Cornell Medicine

Presenter: Mayur Narayan, MD, MPH, MBA, MHPE, FACS, FCCM, FICS

Objectives: TTMs caring for injured patients after MCIs often have no structured mechanism to cope with stress, emotions and feelings and are at increased risk of post-traumatic stress disorder (PTSD). We hypothesized that conducting a formal Schwartz Center Rounds (SCR) after the second deadliest terror attack in New York City history would enhance well-being.

Methods: SCR included physicians, nurses, social workers, psychologists, allied health professionals and chaplains who had an opportunity to share experiences, thoughts and feelings. After presentation, caregivers in audience shared their perspectives. Post SCR survey was conducted to assess impact.

Results: 86 SCR participants included nurses (48.8%), doctors (10.5%), social workers (9.3%), or other professions (27.9%).45/86(52.3%) completed evaluations.20(44.4%) were nurses, 6(13.3%) social workers,3(6.7%) doctor and 16(35.6%) other. All 45 participants (100%)responded that SCR discussed challenging social and emotional aspects of patient care.45(100%)said SCR provided insights into perspectives and experiences of coworkers and 44(97.8%) into perspectives and experiences of patients and families.38(84.4%)felt better prepared to handle MCI situations in the future, 39(86.7%)felt less isolated in work with their patients, and 43(95.6%)felt more open to expressing thoughts, questions, and feelings about patient care surrounding the attack with colleagues.33(73.3%) rated SCR as excellent, while 12(26.7%) rated as good.100% responded SCR was well-facilitated,97.8% felt the program was free of commercial bias, and 97.8% responded they planned to attend SCR again. 95.6% responded that departments/institutions should do more to deal with PTSD in TTMs.

Conclusions: TTMs are at significant risk of PTSD after MCIs. SCR is a platform to enhance the well-being of TTMs in MCIs. More work is needed to incorporate such structured coping platforms at the departmental/institutional level.

Quick Shot Paper #36
January 17, 2019
5:18 pm

QUANTIFYING GEOGRAPHIC BARRIERS TO TRAUMA CARE: URBAN-RURAL VARIATION IN PREHOSPITAL MORTALITY

Molly P. Jarman, PhD, MPH*, Zain Hashmi, MBBS, Yasmin Zerhourni, MD,
Rhea Udyavar, M.D., Craig Newgard, MD, MPH, Ali Salim, MD*, Adil H. Haider, MD, MPH*
Brigham and Women's Hospital

Presenter: Molly P. Jarman, PhD, MPH

Objectives: To examine prehospital injury mortality as an indicator of geographic barriers to trauma care, and quantify the contribution of prehospital injury mortality to geographic disparities in injury mortality.

Methods: Using the CDC WONDER database, we queried county-level incidence of prehospital injury mortality from 1999-2016, and linked the results with population data from the US Census Bureau. County-level rurality was classified based on rural-urban county designations from the National Center for Health Statistics, and the proportion of counties in each state with a rural classification. We used negative binomial regression to estimate the relationship between rurality and prehospital injury mortality, adjusting for county-level distribution of gender, age, income, and insurance coverage. We then estimated adjusted prehospital mortality rates for rural and urban counties.

Results: Figure 1 illustrates county-level prehospital injury mortality rates. Compared to urban counties, unadjusted prehospital injury mortality rates were 41% higher for rural counties (IRR = 1.41, 95% CI: 1.38, 1.45). After adjustment for population demographics, prehospital mortality rates were 21% higher for rural counties (IRR = 1.21, 95% CI: 1.18, 1.24), indicating that population risk factors only partially explain geographic variation in prehospital mortality. As illustrated in the Figure 2, population-adjusted prehospital mortality rates increased with increasing rurality for both penetrating and motor vehicle injuries.

Conclusions: Prehospital injury mortality rates are substantially higher for rural counties compared to urban counties, suggesting that prehospital mortality plays a critical role in rural trauma disparities. These results highlight the need for primary injury prevention, high quality prehospital care, and timely access to trauma care in rural settings.

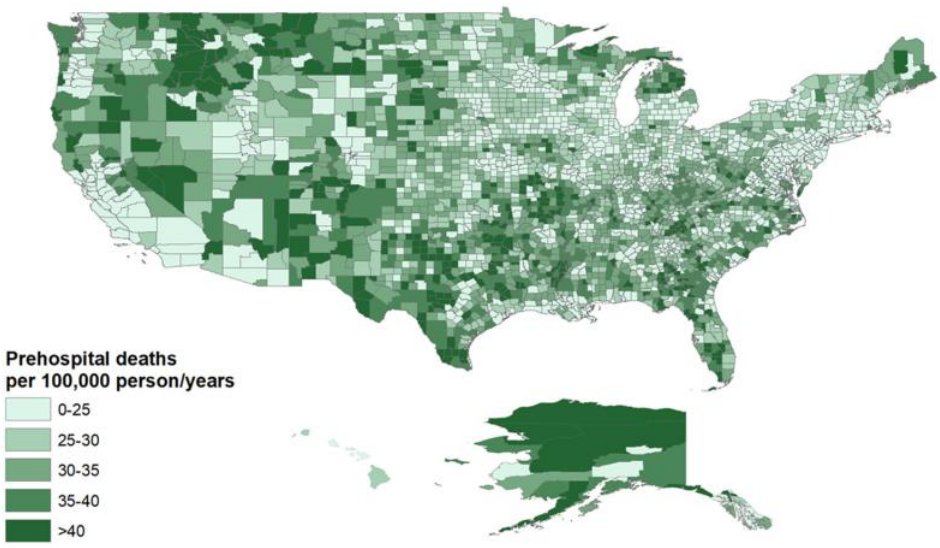


Figure 1: Geographic distribution of prehospital injury mortality per 100,000 person/years, by county

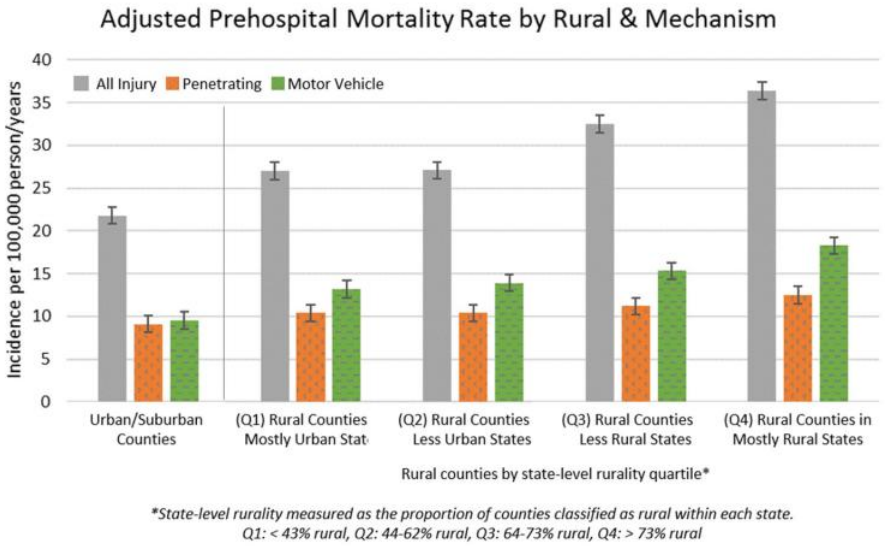


Figure 2: Adjusted prehospital injury mortality rates by urban/rural location and injury mechanism

Quick Shot Paper #37
January 17, 2019
5:24 pm

ORGAN DONATION AFTER TRAUMA; A 30 YEAR REVIEW

Adam M. Ackerman, MD, David E. Clark, MD*, Judyta Lipinska, MD, James Whiting, MD
Maine Medical Center

Presenter: Adam M. Ackerman, MD

Objectives: Over the past 30 years the demographics, clinical characteristics, and management of trauma patients have changed dramatically. During this same time period, the organ donor population has also changed. The interactions between these two demographic shifts has not been examined in a systematic way. It is possible that there could exist opportunities to improve organ donation from victims of trauma if there was a better understanding of how these two phenomena have influenced each other.

Methods: This is a retrospective analysis of data from a clinical dataset. We compared trauma donors (TD) and non-trauma donors (NTD) in the Scientific Registry of Transplant Recipients (SRTR) standard analysis files, a clinical dataset collected by the Organ Procurement Transplant Network on all solid organ transplant candidates, donors, and recipients in the US since 1987.

Results: SRTR contained data on 191,802 deceased donors. The percentage of TD decreased from 55.3% in 1987 to 35.8% in 2016 ($p<.001$) primarily due to a steady increase in NTD. Characteristics of TD and NTD during the last decade are shown in figure 1. TD are significantly younger and more likely to be male while the percentage of donors who were PHS high risk or who underwent donation after cardiac death were clinically similar. TD produce more organs/donor, are more likely to yield an extra-renal organ and exhibit lower (better) KDRIs, a predictor of graft longevity. These better outcomes are maintained even after stratifying by age.

Conclusions: Over the past 30 years the number of NTD has increased much more than the number of TD. However, TD remain a critically important organ donor source, yielding more organs per donor, better quality organs, and a higher likelihood of extra-renal organs. Potential causes such as improved resuscitation protocols should be examined in the future.

	TD	NTD	p
N	32,147	51,197	
Male (%)	74.3	50.3	<.001
Age (mean)	31.1	45.8	<.001
PHS High Risk (%)	14.4	13.4	<.001
Donation after Cardiac Death (%)	14.5	12.8	<.001
Transplanted Organs/donor (mean)	3.5	2.4	<.001
KDRI (mean)	1.12	1.57	<.001
Discard Rate (%)	8.47	19.16	<.001

Figure 1.

Quick Shots Parallel Session IV

Quick Shot Paper #38
January 17, 2019
5:30 pm

ANALYSIS OF AN AMERICAN COLLEGE OF SURGEONS COMMITTEE ON TRAUMA (ACS-COT) APPROVED PILOT PROJECT TO INCREASE PROVIDER COMMUNICATION DURING INTER-HOSPITAL TRAUMA PATIENT TRANSFERS.

Brian Fletcher, MS, RN, ACNP-BC, Marco Bonta, MD, MBA, FACS,
Christina Roberts, MS, RN, ACNP-BC, Kristie Pencil, MS, RN, ACNP-BC,
Sarah K. West, MS, RN, ACNP-BC, M. Chance Spalding, DO, PhD*,
Michael Shay O'Mara, MD, MBA, FACS*
Grant Medical Center

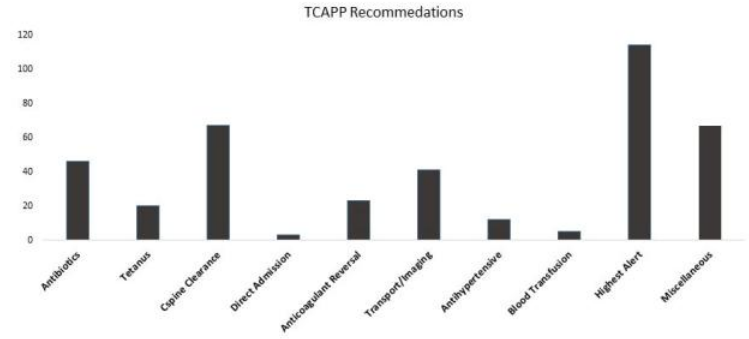
Presenter: Brian Fletcher, MS, RN, ACNP-BC

Objectives: The ACS-COT require "physician to physician communication prior to inter-hospital transfer." This has been difficult to achieve in high volume trauma centers. This pilot program utilized trauma advanced practice providers (APP) as the primary communicator prior to inter-hospital transfers. We hypothesized that APPs could provide safe recommendations and accurately triage patients for the highest level trauma alert.

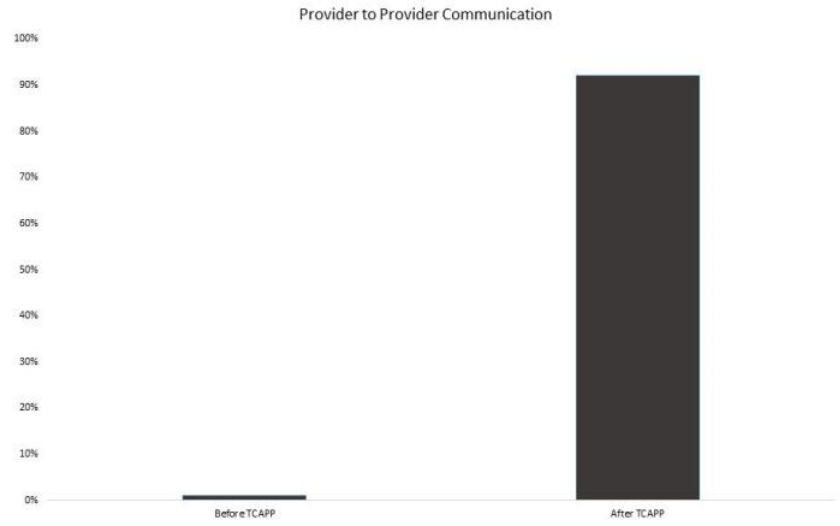
Methods: From January to April 2018, 1145 patients were transferred to either a Level I or Level II trauma center. All inter-hospital trauma transfers were dispatched through a designated transfer center APP (TCAPP). The TCAPPs role was to have direct communication with the referring provider. All TCAPPs were trained to focus on reversal agents for anticoagulants, antibiotics for open fractures, criteria for direct admissions, administration of blood products and triage to the highest level of trauma activation.

Results: Prior to implementation of the TCAPP, direct communication occurred in < 1 % of inter-hospital transfers in our trauma system. During the four month period direct communication occurred 92% of the time ($p<0.001$). The TCAPP made 398 recommendations including antibiotics (n=46, 11%), reversal agents for anticoagulants (n=23, 5%), direct admissions (n=3, 0.7%), blood product administration (n=5, 1%), activation of the highest level alert (n=114, 29%) and miscellaneous (n=207, 52%). Only four (1%) TCAPP recommendations were deemed inappropriate, and none were associated with a negative outcome. The TCAPP (89.7%) and physician (89.9%) triage accuracy was not significantly different ($p=0.43$).

Conclusions: Inter-hospital trauma transfer communication and recommendations can be performed safely and accurately by a trauma trained APP.



TCAPP Recommendations



Provider to Provider Communication

Quick Shot Paper #39
January 17, 2019
5:36 pm

PATHWAY TO SUCCESS: IMPLEMENTATION OF AN INDEPENDENT MULTIPROFESSIONAL ACUTE TRAUMA HEALTHCARE TEAM DECREASES LENGTH OF STAY IN SEVERE TRAUMATIC BRAIN AND SPINAL CORD INJURY PATIENTS REQUIRING TRACHEOSTOMY.

Alvin P. Perry, III, MD, Mike Mallah*, Kyle Cunningham, MD, MPH*,
William S. Miles, MD*, Jennifer Marrero, MSN, RN, Meredith Gombar, MSN, RN,
Michael Davis, BS, A. Britton Christmas, MD, FACS*,
David G. Jacobs, MD*, Peter E. Fischer, MD, MS*, Ronald F. Sing, DO*, Bradley W. Thomas, MD*
Carolinas Medical Center

Presenter: Alvin P. Perry, III, MD

Objectives: The aim of this study was to determine whether the implementation of a dedicated multiprofessional acute trauma healthcare (mPATH) team would decrease length of stay without adversely impacting outcomes of patients with severe traumatic brain and spinal cord injuries. The mPATH team was comprised of a physical, occupational, speech, and respiratory therapist, nurse navigator, social worker, advanced care provider, and physician who performed rounds on the subset of trauma patients with these injuries from the Intensive Care Unit to discharge.

Methods: Following the formation and implementation of the mPATH team at our Level I trauma center, a retrospective cohort study was performed comparing patients in the year immediately prior to the introduction of the mPATH team (n=60) to those in the first full year following implementation (n=70). Demographics were collected for both groups. Inclusion criteria were Glasgow Coma Score (GCS) less than 8 on post-injury day two, all paraplegic and quadriplegic patients, and patients over age 55 with central cord syndrome who underwent tracheostomy. The primary endpoint was length of stay; secondary endpoints were time to tracheostomy, days to evaluation by occupational, physical, and speech therapy, 30-day readmission, and 30-day mortality.

Results: The median time to evaluation by occupational, physical, and speech therapy was universally decreased (Table 1). Injury Severity Score (ISS) was 27 in both cohorts. Time to tracheostomy and length of stay were both decreased (Table 1). 30-day readmission and mortality rates remained unchanged (Table 2). A cost savings of $11,238 per index hospitalization was observed.

Conclusions: In the year following the initiation of the mPATH team we observed earlier time to occupational, physical, and speech therapist evaluation, decreased length of stay, and cost savings in severe traumatic brain and spinal cord injury patients requiring tracheostomy compared to our historical control. These benefits were observed without adversely impacting 30-day readmission or mortality.

Table 1

	pre-mPATH (n = 60), *# days*	post-mPATH (n = 70), *# days*	Time saved with implementation of mPATH, *# days*	% change with implementation of mPATH	*p* value
Median Time to Tracheostomy	9	6	-3	-33 %	$p < 0.001$
Median Time to Occupational Therapy Evaluation	10	4	-6	-60 %	$p < 0.001$
Median Time to Physical Therapy Evaluation	10	6	-4	-40 %	$p < 0.001$
Median Time to Speech Therapy Evaluation	15	10	-5	-33 %	$p < 0.001$
Median Length of Stay (LOS)	26	19	-7	-27 %	$p < 0.001$

Table 2

	pre-mPATH (n = 60)	post-mPATH (n = 70), %	% change with implementation of mPATH	*p* value
30-day Readmission Rate	23.3 %	8.6 %	- 63 %	$p = 0.703$
30-day Mortality Rate	6.7 %	4.3 %	- 36 %	$p = 0.385$

Quick Shot Paper #40
January 17, 2019
5:42 pm

MANAGEMENT AND OUTCOMES OF MODERN WARTIME CERVICAL CAROTID INJURY

Patrick F. Walker, MD, Joseph Bozzay, MD, Joseph White, MD,
Todd Rasmussen, MD, Jigarkumar Patel, MD, Paul White, MD
Walter Reed National Military Medical Center

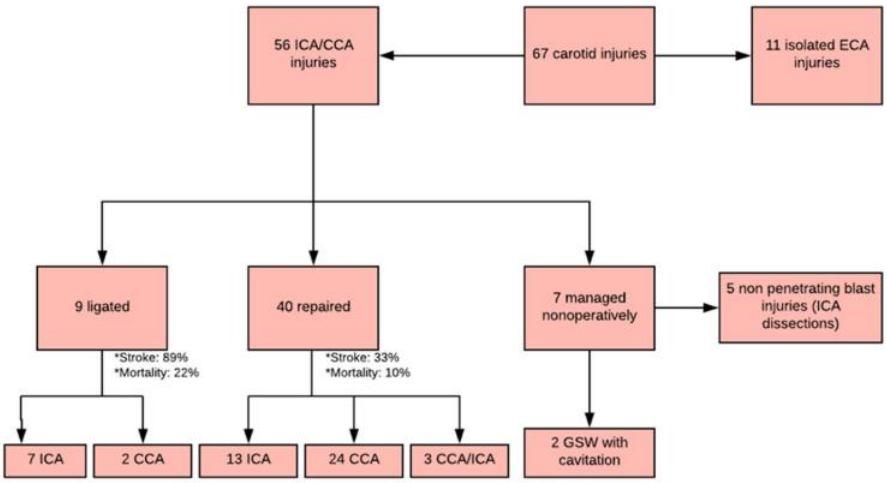
Presenter: Patrick F. Walker, MD

Objectives: Cervical carotid artery injuries are technically challenging entities associated with high morbidity and mortality. This study describes the management and outcomes following carotid injuries during the recent conflicts in Iraq and Afghanistan.

Methods: The Department of Defense Trauma Registry was queried to identify U.S. military personnel who sustained battle-related cervical carotid injury between January 2002 and December 2015. Demographic, injury, and management data were obtained. Statistical analysis was performed to identify associations between injury and management factors as well as stroke and mortality
($p<.05$ statistically significant).

Results: 67 patients (100% male; age 25 +/-7 years) had cervical carotid artery injuries. 56 (84%) sustained a common (CCA) or internal carotid (ICA) injury, and 11 (16%) had an isolated external (ECA) injury. Of the 56 CCA or ICA injuries, 40 (71%) underwent vascular reconstruction, whereas 16 were managed with ligation (n=9) or non-operatively (n=7). Seven of 20 (35%) isolated ICA injuries were ligated compared to 2 of 29 (6.9%) injuries involving the CCA (p=0.02). Compared to vascular reconstruction, CCA or ICA ligation was associated with a higher rate of stroke (89% vs. 33%, p=0.003) and a trend towards increased mortality (22% vs. 10%, p=0.3). Every patient who underwent ICA ligation had a stroke (7/7). There was no difference in injury severity score between the ligation and reconstruction groups (23.8+/-10.6 vs. 24.7+/-13.4, p=0.9). At a mean follow-up of 34.5 months, 10 of 17 stroke survivors had permanent neurologic deficits.

Conclusions: In modern combat, penetrating cervical carotid artery injuries are uncommon. In this series, isolated ICA injuries were 5-times more likely to be ligated than those involving the CCA. ICA ligation as an operative maneuver resulted in stroke in all cases. When possible, attempts at carotid reconstruction should be made irrespective of injury severity.



Flowchart of injuries by management

Quick Shot Paper #41
January 17, 2019
5:48 pm

THE BEERS CRITERIA: NOT JUST FOR GERIATRICS ANYMORE? ANALYSIS OF BEERS MEDICATIONS IN NON-GERIATRIC TRAUMA PATIENTS AND THEIR ASSOCIATION WITH FALLS

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Presenter: Adam Maerz, MS MBBS

Objectives: In 1991 Dr Mark Beers and colleagues published a list of Potentially Inappropriate Medications (PIMs), now knows as the Beers Criteria. This list enumerated medications who's side effects were thought to often outweigh their benefits in the geriatric population. To our knowledge there has been no investigation of the prevalence of, or association with, these PIMs in the adult non-geriatric trauma population. Our hypothesis was that Beers PIM would have a high use rate and association with falls in the adult non-geriatric trauma.

Methods: The trauma database at our level one trauma center was queried for all adult patients presenting for evaluation between January 2014 and September 2017. Pre-admission PIM use was determined from medication reconciliation documented in our medical record at the time of trauma evaluation. Those that did not undergo medication reconciliation were excluded. Patients were stratified by age (18-34, 35-44, 45-54, 55-64) and evaluated for prevalence of PIMs, and PIM class. Multivariate logistic regression analyses were used to calculate odds ratios of fall risks associated with specific age stratifications and PIMs.

Results: 3701 records were included, and a substantial number (65.4%) were taking at least one medication on the PIM list (Table 1). Furthermore, several classes of medications at various age stratifications purported significant odds that traumatic injury would be the result of a fall (Table 2).

Conclusions: This preliminary data indicates that PIMs use is substantial and associated with falls in the adult non-geriatric population across all age groups studied. Given the extremely high prevalence of these medications in our study population, we believe that further research is warranted to evaluate if the Beers Criteria cautions should be expanded beyond the geriatric population.

Medication Class	Adult Falls N (%)	Adult Non-Falls N (%)	p-value	Total N (%)
Antihistamines	122 (15.7%)	338 (11.6%)	.00216	460 (12.4%)
Antipsychotics	69 (8.9%)	194 (6.6%)	.0358	263 (7.1%)
Antispasmodics	22 (2.8%)	39 (1.3%)	.00574	61 (1.6%)
Barbiturates	30 (3.9%)	35 (1.2%)	<.0001	65 (1.8%)
Benzodiazepines	193 (24.9%)	501 (17.1%)	<.0001	694 (18.8%)
Butalbital	28 (3.6%)	31 (1.1%)	<.0001	59 (1.6%)
Proton Pump Inhibitors	189 (24.4%)	485 (16.6%)	<.0001	674 (18.2%)
Tricyclic Antidepressants	77 (9.9%)	125 (4.3%)	<.0001	202 (5.5%)
Non-benzodiazepine Hypnotics	31 (4.0%)	81 (2.8%)	.0981	112 (3.0%)
On ≥ 1 Beers PIM	557 (71.8%)	1862 (63.7%)	<.0001	2419 (65.4%)
Total Patients	776 (21.0%)	2925 (79.0%)		3701

Table 1 – BEERs PIM use across adult trauma patients

		Distribution of PIM use, n (%)		Risk of Falling		
Medication Class/Individual Medication	Age Range (years)	Falls	Non-Falls	Odds Ratio	95% Confidence Interval	p-value
Non-benzodiazepine hypnotics, n (%)	18-34	4/121 (3.3%)	9/1084 (.8%)	7.06	1.52-32.67	.0123
Antihistamines, n (%)	35-44	17/110 (15.5%)	58/585 (9.9%)	2.06	1.09-3.90	.0269
Benzodiazepines, n (%)	35-44	30/110 (27.3%)	105/585 (18.0%)	1.54	1.00-2.38	.0488
NSAID's, n (%)	35-44	34/110 (30.9%)	157/585 (26.9%)	1.57	1.03-2.39	.0349
TCA's, n (%)	35-44	10/110 (9.1%)	21/585 (3.6%)	3.49	1.45-8.37	.0050
On ≥ 1 Beers Med, n (%)	35-44	85/110 (77.3%)	383/585 (65.7%)	1.33	1.12-1.60	.0016
Antipsychotics, n (%)	45-54	19/234 (8.1%)	39/618 (6.3%)	1.55	1.01-2.38	.0457
NSAID's, n (%)	45-54	58/234 (24.8%)	168/618 (27.2%)	1.44	1.01-2.05	.0412
On ≥ 1 Beers Med, n (%)	45-54	174/234 (74.4%)	441/618 (71.4%)	1.17	1.04-1.31	.0090
Barbiturates, n (%)	55-64	13/311 (4.2%)	6/640 (.9%)	4.56	1.43-14.52	.0102
Butalbital, n (%)	55-64	12/311 (3.9%)	4/640 (.6%)	5.45	1.47-20.17	.0111
TCA's, n (%)	55-64	33/311 (10.6%)	41/640 (6.4%)	1.82	1.09-3.06	.0228

Table 2. Prevalence and fall risks associated with specific PIMs in different age brackets

Quick Shot Paper #42
January 17, 2019
5:54 pm

PREVENTABLE DEATH AND INTERPERSONAL VIOLENCE IN THE UNITED STATES: WHO CAN BE SAVED?

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Presenter: Heather E. Carmichael, MD

Objectives: Public health initiatives to reduce mortality from penetrating trauma have largely developed from patterns of injury observed in military casualties, with an eye towards hemorrhage control and use of tourniquets. Recent efforts show that injury patterns differ between civilian mass casualty events and combat settings, and no studies characterize wounding patterns in all types of civilian homicide. We hypothesize that many homicide deaths are due to non-survivable injuries, and that an effective strategy to reduce mortality must focus on both primary prevention as well as improvement in trauma pre-hospital care.

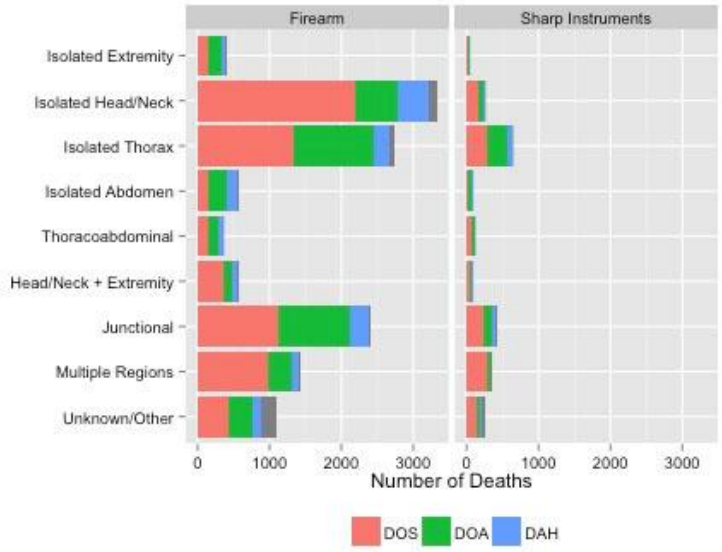
Methods: We analyzed homicides from the National Violent Death Reporting System from 2012 to 2015. We excluded deaths due to poisoning, intentional neglect, or unknown weapon. Deaths were classified as "Dead on Scene (DOS)", "Dead on Arrival (DOA)", or "Dead at or After Hospital (DAH)" if the patient was admitted to a hospital. Injury patterns for penetrating weapons (firearms and sharp instruments) were further categorized.

Results: We included 18,051 homicides, the vast majority of which were due to firearms (n=12901 or 71.5%) or sharp instruments (n=2265 or 12.5%). The most common injury patterns included wounds to the chest or head, with isolated extremity injuries representing a minority of both firearms deaths (n= 397 of 12901, 3.1%) and deaths from sharp instruments (n=50 of 2265, 2.2%). Furthermore, over half of all deaths occurred pre-hospital, with only 13.3% of victims surviving beyond the Emergency Room.

Conclusions: The vast majority of deaths from interpersonal violence are due to firearm injuries. Few deaths appear to be related to extremity hemorrhage alone, and over half of all fatally injured died at the scene. Strategies to decrease mortality from interpersonal violence must go beyond treating injuries that have already occurred and must address violence prevention directly.

Injury Pattern	Definition	Firearm Deaths (n=12,901)	Sharp Weapon Deaths (n=2265)
Isolated Extremity	Injury documented **to the upper and/or lower extremities only**	397 (3.1%)	50 (2.2%)
Isolated Head/Neck	Injury documented to the **head or neck only**, including those with concomitant injury to the spine/face	3327 (25.8%)	266 (11.7%)
Isolated Thorax	Injury documented to the **thorax only**, +/- injury to the neck/spine	2728 (21.1%)	644 (28.4%)
Isolated Abdomen	Injury documented to the **abdomen only**, +/- spine	564 (4.4%)	94 (4.2%)
Thoracoabdominal	Injury documented to the **thorax and abdomen**, +/- neck/spine	367 (2.8%)	115 (5.1%)
Head/Neck and Extremity	Injury documented to the **head/neck** (+/-spine/face) **and an extremity**	575 (4.5%)	86 (3.8%)
Junctional - Torso and Extremity	Injury documented to the **thorax or abdomen** (+/- neck/spine) **and an extremity**	2415 (18.7%)	414 (18.3%)
Multiple regions	Injury documented to the **head or neck** (+/-face/spine) **and thorax or abdomen**, +/- extremity	1436 (11.1%)	346 (15.3%)
Unknown/Other	No injuries documented, or other injury pattern	1092 (8.5%)	250 (11.0%)

Definitions and prevalence of wounding patterns in deaths from firearms and sharp weapons



Deaths from firearms and sharp instruments, categorized by wounding pattern and death location ("Dead on Scene (DOS)", "Dead on Arrival (DOA)" or "Dead at or After Hospital (DAH)"

Quick Shot Paper #43
January 17, 2019
6:00 pm

MAINTAINING THE HIGH: ILLICIT DRUG USE IS PREDICTIVE OF DELIRIUM AND MORTALITY IN THE ICU

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Presenter: Vaidehi Agrawal, PhD

Objectives: Delirium is a common ICU complication known to be associated with higher cost of care and 3-fold higher mortality. Risk factors include pre-existing neurologic disease, depression and dementia. No study to date has evaluated the association between delirium and illicit drug use in trauma ICU patients.

Methods: From Jan 2017 to Jan 2018, a retrospective analysis was conducted of all trauma ICU admits = 18 y/o, who were screened for drug use in the ED. Patients were administered the Confusion assessment method (CAM) - ICU every 24 hours until ICU discharge. A total of 63 data points including demographics, procedures and clinical outcomes were collected. Primary endpoint was to determine if there is an association between drug use and delirium. Additionally, logistic regression analysis was employed to assess the impact of drug on delirium and clinical outcomes.

Results: Out of 2,069 trauma admits, 15% (306) patients met the inclusion criteria. The patient age was 48 ± 22 y/o with 30% female and ISS of 15 ± 11. The incidence of delirium was 12% (37/306) with 2% patients having >1 episode. Drug positive patients were more likely to develop delirium (OR 2.7x, p<0.01). Contributing drugs include THC (OR 5.8x, p<0.01) and PCP (OR 11.8x, p<0.01). Patients who were drug positive and also developed delirium had significantly higher mortality (OR 6.4x; p: 0.04) and longer ventilator, ICU, hospital days and procedures (Table 1).

Conclusions: The COT mandates drug screening in trauma patients for injury prevention. Here we present data demonstrating drug positivity as a risk factor for the development of delirium (2.7x). In addition, the coexistence of delirium and drug use results in increased mortality (6.4x) and worse clinical outcomes. Future prospective studies to confirm these findings are warranted.

Table 1

	Variable	Drug +	Drug -	p-value
Delirium positive	Vent days	7 ± 8	1 ± 4	p<0.01
	ICU days	9 ± 9	5 ± 6	p<0.01
	Hosp. days	23 ± 43	8 ± 9	p<0.01
	Mortality	32%	8%	OR:6.4x; p: 0.04
	Tracheostomy	53%	44%	OR:6.5x; p<0.01
Delirium negative	Vent days	1 ± 2	1 ± 4	p:0.532
	ICU days	5 ± 8	5 ± 6	p: 0.837
	Hosp. days	10 ± 15	8 ± 9	p: 0.289
	Mortality	7%	7%	OR:1.0x; p:0.98
	Tracheostomy	32%	15%	OR:3.6x; p<0.01

Quick Shots Parallel Session IV

Quick Shot Paper #44
January 17, 2019
6:06 pm

TRANEXAMIC ACID ADMINISTRATION AND NEUROLOGIC OUTCOMES IN A COMBAT SETTING: IS TXA IDEAL FOR TBI?

Douglas R. Morte, MD, Jason Bingham, MD, Matthew J. Martin, MD, FACS*,
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Presenter: Douglas R. Morte, MD

Objectives: Tranexamic acid (TXA) has been shown to decrease mortality and blood product requirements in severely injured patients. TXA has also been hypothesized to prevent secondary brain injury in patients with TBI. Prior studies demonstrated improved neurologic outcomes with TXA administration in injured pediatric patients, no such studies have been performed in adults.

Methods: Retrospective review of adult trauma admissions to NATO hospitals in Iraq and Afghanistan between 2008-2015. Univariate and multivariate analysis was used to identify factors associated with TXA administration, patients were then propensity score matched based on demographics, mechanism of injury, Injury Severity Score (ISS), presenting Glascow Coma Score (GCS), initial vitals/labs, and initial transfusion requirement. Primary outcomes were mortality rate and neurologic outcomes measured by discharge GCS and requirement for intubation at discharge.

Results: 4476 injured patients 18 years or older were evaluated. 266 (5.9%) of these patients required a massive transfusion in the first 24 hours and 174 (3.9%) received TXA. Patients who received TXA had significantly higher ISS, more penetrating injuries, lower presenting GCS, higher incidence of severe head injury (AIS>3), and higher transfusion requirements. 92 patients were included in the propensity matched cohort. Patients who received TXA had a lower mortality rate (0% vs 10.1%, p=0.02) and improved neurologic outcomes (100% vs 87% with discharge GCS 14-15, p=0.01) compared to patients without TXA. There were no significant differences in thromboembolic events between the two groups.

Conclusions: TXA administration in adult combat trauma patients was independently associated with decreased mortality and improved neurologic outcomes, with no increase in thromboembolic events. Further study of the possible mechanisms and effect of TXA on brain injury and neurologic outcomes is warranted.

	Overall (n=4476)	TXA (n=174)	No TXA (n=4302)	Significance
Age, mean	25.6	24.3	25.7	0.002
MOI, penetrating n (%)	1611 (36.0)	161 (93.6)	1450 (33.7)	<0.001
ISS, Mean	10.8	29.1	10.1	<0.001
Head AIS >3, %	14.0	57 (32.8)	588 (13.7)	<0.001
Presenting GCS				
14-15, n (%)	4003 (89.4)	59 (33.9)	3944 (91.7)	<0.001
9-13, n (%)	101 (2.3)	19 (10.9	82 (1.9)	<0.001
3-8, n (%)	372 (8.3)	96 (55.2)	276 (6.4)	<0.001
MAP, mean	44.0	43.7	44.1	0.560
Base Deficit, mean	0.2	1.1	0.3	0.001
Transfusion 1st 24 hrs, Units mean (SD)	3.1 (13.1)	39.5 (39.0)	1.2 (5.2)	<0.001
Emergent Operation, n (%)	1911 (42.7)	82 (47.1)	1829 (42.5)	<0.001
Neurosurgical Intervention, n (%)	181 (40.4)	22 (12.6)	159 (3.7)	<0.001

Table 1. Study Population Characteristics. TXA = Tranexamic Acid MOI = Mechanism of injury; ISS = Injury Severity Score; AIS = Anatomic Injury Score; GCS = Glascow Coma Scale; MAP= Mean Arterial Pressure

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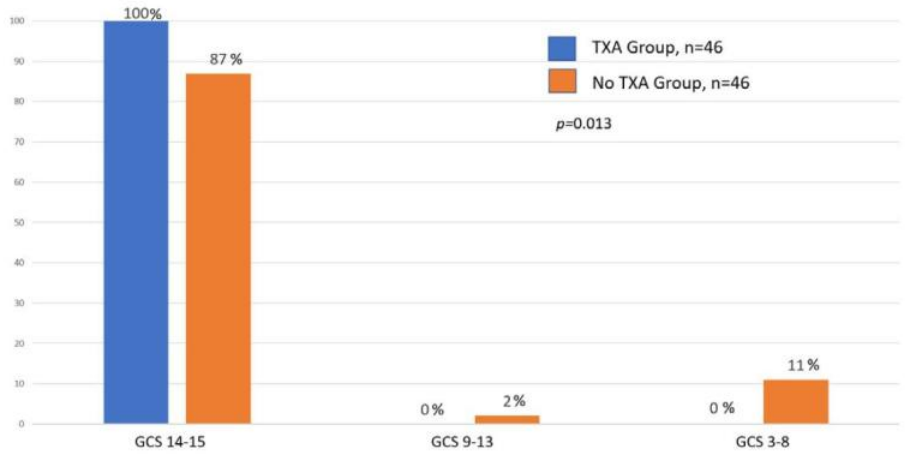

Figure 1. – Disposition Neurologic Outcome in Matched Cohort. TXA=Tranexamic Acid. GCS = Glascow Coma Scale.

Figure 1. - Disposition Neurologic Outcome in Matched Cohort. TXA = Tranexamic Acid. GCS = Glascow Coma Scale

Quick Shots Session V

Quick Shot Paper #45
January 18, 2019
7:45 am

ARTIFICIAL NEURAL NETWORKS CAN PREDICT TRAUMA VOLUME AND ACUITY: A MULTICENTER STUDY

Brad Dennis, MD, FACS*, David Stonko, Richard A. Sidwell, MD, FACS*, Nicole A. Stassen, MD, FACS, FCCM*, Mitchell J. Cohen, MD, FACS, Bryan A. Cotton, MD, MPH, Oscar D. Guillamondegui, MD, MPH*
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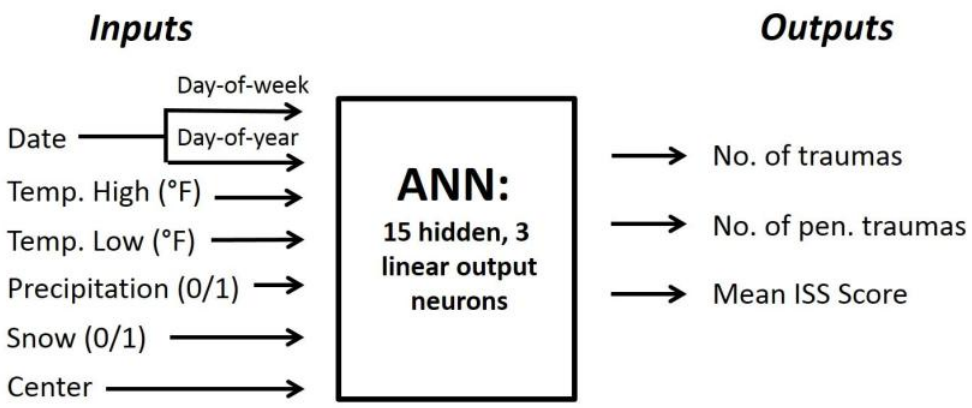
Presenter: Brad Dennis, MD, FACS

Objectives: Trauma has long been considered unpredictable. Artificial neural networks (ANN) have recently shown the ability to predict admission volume, acuity and operative needs at a single trauma center with very high reliability. We hypothesize that an artificial neural network can accurately predict trauma admission volume, penetrating trauma admissions, and mean ISS with a high degree of reliability across multiple trauma centers.

Methods: Three years of admission data was collected from five geographically distinct US level 1 trauma centers. Patients with incomplete data, pediatric patients and primary thermal injuries were excluded. Daily number of traumas, number of penetrating cases, and mean ISS was tabulated from each center along with National Oceanic and Atmospheric Administration data from local airports. We trained a single two-layer feed-forward ANN on a random majority (70%) partitioning of the data from all centers using Bayesian Regularization and minimizing mean squared error. The ANN model is shown in the figure 1. Pearson's product-moment correlation coefficient was calculated for each partition, for each trauma center, and for high and low volume days (>1 standard deviation above or below mean total number of traumas).

Results: 5,410 days were included. 43,380 traumas, including 4,982 penetrating traumas. The mean ISS was 11.78 (SD=6.12). On the training partition, we achieved R = 0.8733. On the testing partition (new data to the model), we achieved R = 0.8732, with a combined R = 0.8732. Results for each trauma center are shown in figure 2. For high and low volume days, we achieved R = 0.8934 and R = 0.7963, respectively.

Conclusions: An ANN successfully predicted trauma volumes and acuity across multiple trauma centers with very high levels of reliability. This can potentially provide a framework for determining resource allocation at both the trauma system level and the individual hospital level.



	Houston	Nashville	Denver	Rochester	Des Moines
Mean No. Trauma Contacts/day	15.0 (SD 4.9)	9.8 (SD 3.9)	6.4 (SD 2.9)	4.8 (SD 2.6)	3.7 (SD 2.2)
Mean No. Penetrating Traumas/day	1.3 (SD 1.3)	1.2 (SD 1.2)	1.0 (SD 1.1)	0.8 (SD 1.4)	0.2 (SD 0.4)
Mean ISS	11.6 (SD 2.7)	14.9 (SD 4.3)	10.3 (SD 4.9)	13.0 (SD 9.5)	9.2 (SD 5.2)
Correlation Coefficient	0.8895	0.8729	0.7721	0.9093	0.7481

Results of Each Trauma Center

Quick Shot Paper #46
January 18, 2019
7:51 am

CITATION RATES OF INJURED INTOXICATED DRIVERS - HAVE WE IMPROVED OVER TIME?

Michelle Yen, BA, Vanessa P. Ho, MD, MPH*, Brian T. Young, MD,
Jeffrey A. Claridge, MD, MS, FACS*, John J. Como, MD, MPH*
MetroHealth Medical Center

Presenter: Michelle Yen, BA

Objectives: Historically, the citation rate of patients admitted to a trauma center while driving under the influence of alcohol (DUI) was low, with a citation rate of 33% and a conviction rate of 21% reported at our center in a 1998 study. The purpose of this study was to determine if the citation and prosecution rates of injured drunk drivers has changed over time and to evaluate factors associated with these rates.

Methods: Medical records of drivers in vehicular crashes with blood alcohol levels above 0.08 g/dL admitted to our center from January 2014 to December 2015 were reviewed. Factors such as age, gender, admission blood alcohol level, and length of hospital stay were recorded. Patient names were cross-referenced with publicly available court records from counties surrounding our center to assess for any charges associated with the hospital visit, the type of penalty received, other types of previous criminal charges, the number of previous DUI convictions, and whether there were any subsequent DUI convictions. Statistical analyses were performed using the Chi-square test.

Results: A total of 194 patients met inclusion criteria. Of these patients, 46 (23.7%) were cited for any charge related to the incident, 27 (13.9%) were cited for DUI, and 22 (11.3%) were convicted of DUI. Of the other factors analyzed, having previous criminal charges and having a previous DUI were significantly (both $p < 0.001$) associated with a DUI citation. There was no significant association found between a DUI citation and the value of blood alcohol content, length of the hospital stay, or whether the incident was a multiple-vehicle collision.

Conclusions: Patients admitted for vehicular crashes with legal intoxication continue to have low citation and prosecution rates for DUI. These DUI citation rates remain low despite other measures, such as lowering the DUI threshold, which have been implemented over the past 20 years to discourage drunk driving.

Quick Shot Paper #47
January 18, 2019
7:57 am

HYPOBARIA WITH AND WITHOUT VIBRATION REDUCED WHITE BLOOD CELL COUNT AND INFLAMMATORY CYTOKINES 48 HOURS AFTER SIMULATED AEROMEDICAL EVACUATION IN BLAST TBI RATS

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Meghan Patterson, BS, Jordan Hubbell, BS, Joel Duberstein, BS,
Alexander Connor, BS, Fang Zhou Yang, BS, Melissa Mehalick, PhD,
Carl Goforth, BS, Francois Arnaud, PhD, Anke H Scultetus, MD
Walter Reed National Military Medical Center

Presenter: Debra L. Malone, MD

Objectives: Little is known about the effects of aeromedical evacuation (AE) on the physiology/morbidity of wounded war fighters. TBI patients are of particular concern since changes in cabin pressure, temperature, and constant vibration could have detrimental effects on an injured brain. In this study we investigated the effects of hypobaria and vibration on inflammation after brain and lung injury in a rat model of moderate blast injury.

Methods: Two days after blast, animals underwent a 12-hour simulated AE flight in a hypobaric chamber (HYPO) [with simulated cabin pressure equivalent to long-range fixed wing flights (8,000 ft. altitude)] with and without vibration. Control animals underwent the same experiments under normobaric conditions (NORMO). Sham animals underwent the same experiments without blast. Animals were recovered and euthanized at 48 hours after flight. Cytokines and hematological parameters were assessed.

Results: In sham groups, hypobaria with or without vibration resulted in an increase in white blood count [WBC; significant in HYPO only animals ($p<.05$)], and in pro-and anti-inflammatory cytokines. Interestingly, this observation was consistently reversed in TBI animals. WBC count and pro-inflammatory cytokines were reduced in injured hypobaric animals compared to normobaria. Hypobaria and vibration increased anti-inflammatory IL-4 in injured HYPO animals. Fractalkine was significantly increased in TBI NORMO with vibration animals compared to sham ($p<.01$), but TBI animals with HYPO and vibration had reduced levels ($p<.05$).

Conclusions: While it has been shown before that TBI increases inflammatory responses, the meaning of reduction of such in TBI animals that underwent hypobaria with or without vibration in this rat blast model is not immediately obvious. Further studies investigating longitudinal effects of AE are indicated.

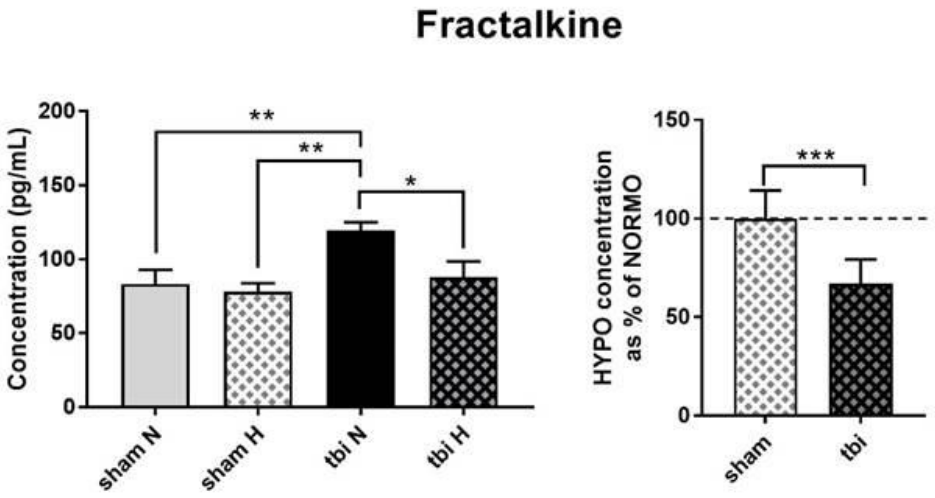

Fig.1:Fractalkine. Hypobaria only groups, 48 hour survival after simulated transport. *p<.05 **p<.01 ***p<.001

Quick Shots Session V

Quick Shot Paper #48
January 18, 2019
8:03 am

REDEFINING MINIMAL TRAUMATIC BRAIN INJURY (MTBI): A NOVEL CT CRITERIA TO PREDICT INTERVENTION

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Carolinas Medical Center

Presenter: Michael R. Arnold, MD

Objectives: mTBI is defined as Glasgow Coma Score (GCS) of 14 or 15. Despite good outcomes, patients are commonly transferred to trauma centers for observation and/or neurosurgical consultation. The aim of this study is to assess the value of redefining mTBI with novel radiographic criteria to determine the appropriateness of interhospital transfer for neurosurgical evaluation.

Methods: A retrospective study of patients with blunt head injury with GCS 13-15, and CT head from Jan 2014-Dec 2016 was performed. A novel criteria of head CT findings (Table 1), created at our institution, was used to classify mTBI, defined by no more than two category A lesions and no category B lesions. Patients were defined as high risk if they had greater than two category A lesions, or any category B lesions. Outcomes included neurosurgical intervention and transfer cost.

Results: A total of 2,120 patients were identified with 1,442 (68.0%) meeting CT criteria for mTBI and 678 (32.0%) classified high risk. Two (0.14%) patients with mTBI required neurosurgical intervention compared with 143 (21.28%) high risk TBI ($p<0.0001$). Mean age (55.8 years), and anticoagulation (2.6% vs. 2.8%) or antiplatelet use (2.1% vs. 3.0%) was similar between groups ($p>0.05$). Of patients with mTBI, 689 were transferred without receiving neurosurgical intervention. Given an average EMS transfer cost of $700 for ground and $5,800 for air, we estimate an unnecessary transfer cost of $733,600.

Conclusions: Defining mTBI with the described novel criteria further defines patients who can be safely managed without transfer for neurosurgical consultation. These unnecessary transfers represent a substantial financial and resource burden to the trauma system, and inconvenience to patients.

Table 1: Checklist for mTBI

Category A
Traumatic SAH
Tentorial or Falcine SDH Less Than or Equal to 4 mm in Thickness
Convexity SDH (Left or Right) Less Than or Equal to 4 mm in Thickness
Solitary Traumatic IPH (contusion) Less Than 1 cm
Isolated Intraventricular Hemorrhage Less Than or Equal to 4mm in a Lateral Ventricle
Category B
Any Category A Lesion Greater Than Allowed Size
Midline Shift
Skull Fracture
Compression of Basal Cisterns
Diffuse SAH or SAH Involving Basal Cisterns
Subacute or Chronic SDH

Qualification for mTBI: "Yes" to no more than two category A lesions. "No" to all category B lesions.

Quick Shot Paper #49
January 18, 2019
8:09 am

HIGH-PERFORMANCE ACUTE CARE HOSPITALS: EXCELLING ACROSS MULTIPLE EMERGENCY GENERAL SURGERY OPERATIONS IN THE GERIATRIC PATIENT

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Yale University School of Medicine

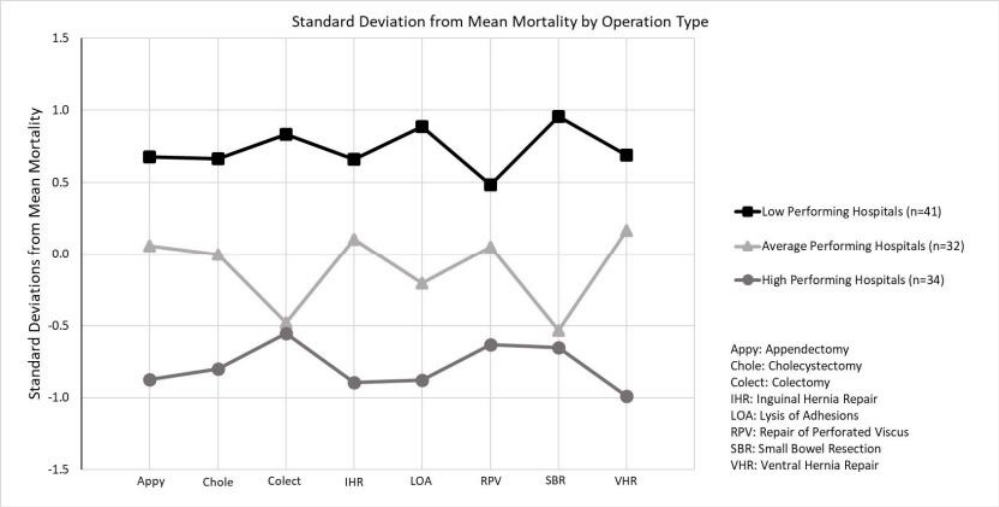
Presenter: Michael P. DeWane, MD

Objectives: As the geriatric population grows, the need for acute care hospitals performing high-quality emergency general surgery (EGS) on older patients will increase. Identifying distinct clusters of hospitals based on geriatric EGS mortality-performance would substantiate the need for qualitative analysis of hospital practices that benefit older EGS patients. This study sought to identify clusters of hospitals based on performance for EGS geriatric patients and to determine if hospital performance varied by operation type.

Methods: Hospitals in the California State Inpatient Database were included if they performed a range of 8 common EGS operations in patients =65 years old over a 2-year period (2010-2011). Multivariable beta regression models risk-adjusted at the patient- and hospital-level were created to define hospital mortality. Centroid cluster analysis was employed to identify groups of hospitals based on in-hospital mortality, and to determine if mortality-performance differed by operation.

Results: 107 hospitals performed 24,279 EGS operations in older patients over the 2 years. Hospitals separated into 3 distinct clusters (Figure I): high-, average-, and low-performers. The high-performing hospitals had survival rates 1 to 2 standard deviations better than the low-performers ($p<0.001$). For each cluster, hospital mortality-performance in any one EGS operation predicted similar performance for all EGS operations.

Conclusions: Hospitals conducting EGS operations in geriatric patients cluster into 3 distinct groups based on their mortality-performance. High-performing hospitals significantly out-perform the average- and low-performers for every operation; the high-performers achieve reliable, high-quality results regardless of operation type. Further qualitative research is needed to investigate the drivers of hospital performance in the geriatric EGS population.



Cluster Specific Standard Deviation from Mean Mortality by Operation Type

Quick Shot Paper #50
January 18, 2019
8:15 am

TWO URGENCY CATEGORIES, SAME OUTCOME: NO DIFFERENCE AFTER "THERAPEUTIC" VS "PROPHYLACTIC" FASCIOTOMY

Megan T. Quintana, MD*, Benjamin Moran, MD*, Thomas M. Scalea, MD, FACS, FCCM*, Jonathan J. Morrison, MRCS, James V. O'Connor, MD*, David V. Feliciano, MD, FACS*, Joseph J. DuBose, MD*
R Adams Cowley Shock Trauma Center

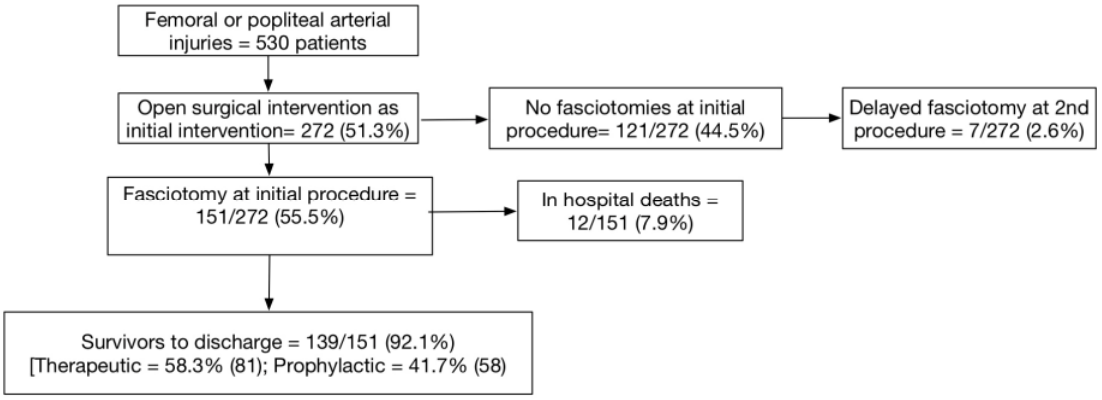
Presenter: Megan T. Quintana, MD

Objectives: Fasciotomy remains an important adjunct in the management of peripheral vascular injuries, yet the indications for and natural history of this intervention are not well elucidated. The objective of our study is to review current indications for fasciotomy and intervention patterns.

Methods: The AAST PROOVIT registry was utilized to identify patients undergoing 4 compartment fasciotomy of the leg after femoropopliteal arterial injuries. Outcomes after fasciotomy for therapeutic and prophylactic indications were compared, including whether primary skin closure or split-thickness skin grafting (STSG) was performed.

Results: From 2013 to 2018, 530 patients with femoropopliteal artery injuries were identified; 272 (51.5%) underwent surgical management. Fasciotomy was performed at the initial operation in 55.5% (151/272) of patients, with 92.1% (139/151) surviving to discharge. Delayed fasciotomy was performed at reoperation in only 5.8% (7/121) of these patients. Among survivors, fasciotomies were classified "therapeutic" in 58.3% (81/139) and "prophylactic" in 41.7% (58/139). There were no significant differences between groups, including amputation rate (14.8% vs. 8.6%, p=0.272) and the rate of primary skin closure (54.0% vs. 53.4%, p=0.919) of the fasciotomy site. Comparison of rates of primary skin closure versus STSG coverage revealed that skin closure was more likely among patients who were more severely injured (ISS 16.0 vs. 10.0, p=0.039; Extremity AIS 3.3 vs. 2.8, p=0.007). Primary skin closure was achieved at a median of 5.0 days vs. 11.0 days for STSG (p=0.001).

Conclusions: Over 55% of patients undergoing repair of a femoral or popliteal artery injury have a fasciotomy performed at the same operation. Delayed fasciotomies are very uncommon in the modern era. A "therapeutic" indication for fasciotomy continues to be more common than "prophylactic." Outcomes are identical in both groups.



Flow diagram of patient selection, showing injury selection, initial intervention including fasciotomy vs delayed fasciotomy, and survival outcomes.

	Therapeutic Fasciotomy (81)	Prophylactic Fasciotomy (58)	p - value
Primary closure achieved, % (n)	54.0% (44)	53.4% (31)	p = 0.919
Limb amputation, % (n)	14.8% (12)	8.6% (5)	p = 0.272
Days till closure; Median (IQR)	6.0 (8)	7.0 (9)	p = 0.903

Outcome differences between therapeutic vs prophylactic fasciotomy.
No significant difference was found in rate of primary closure or amputation.

Quick Shot Paper #51
January 18, 2019
8:21 am

DRIVING BIOLOGY: THE EFFECT OF STANDARDIZED WOUND MANAGEMENT ON WOUND BIOMARKER PROFILES

Christopher J. Dente, MD*, Edda Styrmisdottir, MS, Seth Schobel, PhD,
Benjamin Potter, MD, Jonathan Forsberg, MD, PhD,
Timothy G. Buchman, MD*, Allan Kirk, MD, Eric Elster, MD, FACS
Emory University School of Medicine

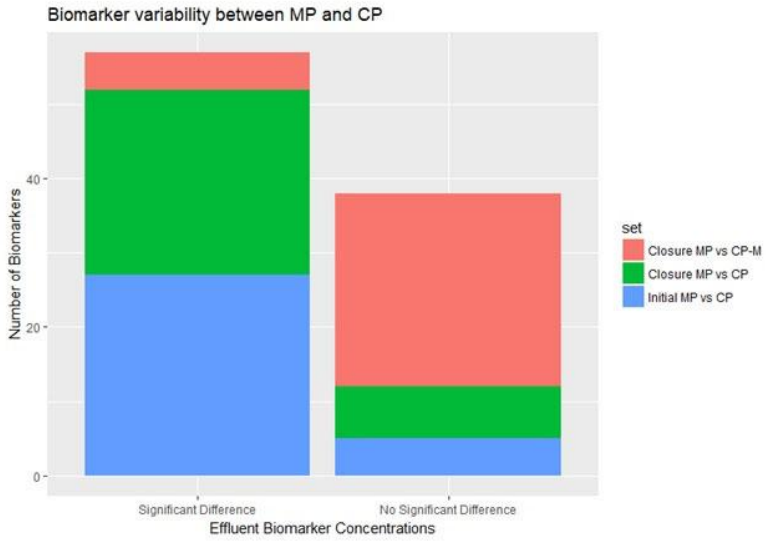
Presenter: Christopher J. Dente, MD

Objectives: The timing of coverage of an open wound is based on heavily on clinical gestalt. DoD's Surgical Critical Care Initiative (SC2i) created a Clinical Decision Support Tool (CDST) that predicts wound closure success using clinical and biomarker data. The military uses a regimented protocol consisting of serial washouts and debridements. While decisions around wound closure in civilian centers are subject to the same clinical parameters, pre-closure wound management is generally much more variable. We hypothesized that the variability in management would affect local biomarker expression within these patients.

Methods: We compared data from 116 wounds in 73 military patients (MP) to similar data from 88 wounds in 78 civilian patients (CP). We used two sample T tests to assess concentrations of 32 individual biomarkers taken from wound effluent. Along with differences in the debridement frequency, we focused on these local biomarkers in MP and CP at both the first washout and the washout performed just prior to attempted closure.

Results: On average, CP waited longer from the time of injury to closure (18.93 vs. 11.63 days, $p = 0.0002$) and had fewer washouts (2.82 vs. 3.46, $p=0.032$). When comparing the wound effluent between the two populations, they had marked biochemical differences both when comparing the results at the first washout and at the time of closure. (Table) However, in a subset of civilian patients (CP-M) whose average number of days between washouts was no more than the maximum value of the MP (2.85 days), those differences ceased to be significant for most variables.

Conclusions: There were significant differences in the baseline biochemical makeup of wounds in the CP and MP. These differences could be eliminated if both were treated under similar wound care paradigms. Variations in therapy affects not only outcomes but the actual biochemical makeup of wounds.



The differences in biomarker profiles at initial washout (blue) and final washout (green) remain unchanged in MP and CP. In the subset of civilian patients treated similar to MP (red), the differences in biomarker profile disappear for the majority of biomarkers.

Quick Shot Paper #52
January 18, 2019
8:27 am

ELDERLY PATIENTS PRESENTING TO A LEVEL I TRAUMA CENTER WITH A POLST FORM: A PROPENSITY-MATCHED ANALYSIS

Jessica Ballou, MD, Elizabeth Dewey, MS, David Zonies, MD, MPH, FACS, FCCM*
Oregon Health and Science University

Presenter: Jessica Ballou, MD

Objectives: Physician Orders for Life-Sustaining Treatment (POLST) forms are portable medical orders documenting patient treatment preferences in an acute health decline. It is unclear how these forms impact outcomes in elderly trauma patients.

Methods: Patients age 65+ presenting to a Level 1 trauma center were identified between 2012-2017. Hospital trauma registry and medical charts were used to identify a pre-injury POLST and its acknowledgement by providers within 24 hours of arrival. A 1:1 propensity score matched sample was used to evaluate clinical outcomes based on the presence of a POLST with $p<0.05$ deemed significant.

Results: 3,342 elderly trauma patients were identified. 192 (6%) had a POLST prior to injury. Do Not Attempt Resuscitation (DNR) was listed in 154 patients (80%) and 79% desired to avoid the intensive care unit (ICU) with limited (54%) or comfort measures only (CMO, 25%). 107 (75%) POLST DNR patients had a DNR code status for the majority of their admission. 59 (58%) of the limited and 29 (60%) of the CMO patients were admitted to the ICU. Pre-injury POLST or code status was acknowledged in 108 cases (57%). Propensity score analysis yielded a comparison sample of 372 patients. In the matched comparison, a known POLST was associated with shorter ICU (1.8 vs 2.8 days, $p=0.02$) and total length of stay (3.9 vs 5.4 days, $p=0.02$). There was no difference in ICU admission (58% vs 63%, $p=0.5$) or in-hospital mortality (11% vs 7%, $p=0.2$). No significant differences in outcomes were seen between those with an unacknowledged or no POLST in the matched sample.

Conclusions: Patients with an acknowledged POLST had lower medical resource use without an increase in in-hospital mortality compared to similarly injured elderly patients without a POLST. With only a limited number of POLST forms acknowledged, there is a need for increased awareness among providers treating elderly trauma patients.

Quick Shot Paper #53
January 18, 2019
8:33 am

LAPAROSCOPIC VS OPEN COLECTOMY FOR COLONIC VOLVULUS: A NSQIP DATABASE REVIEW

Jordan M. Kirsch, DO, Jesse Goddard, MD*, Ebondo Mpinga, MD, Mark Sharrah, MS
WellSpan -- York Hospital

Presenter: Jordan M. Kirsch, DO

Objectives: Colonic volvulus accounts for approximately 15% of large bowel obstructions in the United States. Colectomy is the generally accepted definitive management strategy. However, little data exists comparing the open versus laparoscopic approaches.

Methods: The NSQIP 2014 participant use file (PUF) and 2014 targeted Colectomy PUF were merged. Cases without the primary diagnosis of volvulus were excluded. Casematching was used to create cohorts of laparoscopic vs open surgery by matching the variables: age, gender, BMI, ASA Class 3 or greater, non-independent functional status, chronic steroid use, preoperative dialysis dependence, race, and smoking status. The two groups were compared for differences in patient outcomes using Mann Whitney U tests for continuous variables and Chi Squared and Fisher's Exact tests for categorical variables.

Results: Case matching yielded 83 patients in each group. Laparoscopic cases had a significantly longer operative time (121 vs 86 min) and earned a higher number of WRVU's (26.42 vs 22.59) but were not associated with a decreased length of stay (6 vs 6). The laparoscopic approach was also associated with higher organ space infection and unplanned return to the OR rates. There was a trend towards increased anastomotic leaks in the laparoscopic group but was not statistically significant.

Conclusions: Laparoscopic colectomy for volvulus was found to offer no advantage over the open approach in this cohort. Operating time and complications were higher in the laparoscopic group and the perceived benefit of laparoscopy in terms of decreased length of hospital stay was not observed. Further investigation is needed to confirm these findings in a prospective fashion.

Post-Operative Morbidity of Colectomy for Volvulus by Surgical Approach

Complication	Open	Laparoscopic	P Value
Anastomotic Leak	1.2% (1)	6.0% (5)	0.21
Postoperative Ileus	18.3% (15)	14.6% (12)	0.53
Discharge Destination Not Home	19.5% (17)	16.9% (14)	0.69
Superficial Surgical Site Infection	4.8% (4)	2.4% (2)	0.41
Deep Incisional SSI	0% (0)	0% (0)	1
Organ Space SSI	0% (0)	10.8% (9)	0
Pneumonia	6% (5)	1.2% (1)	0.1
Unplanned Reintubation	3.6% (3)	2.4% (2)	0.7
Pulmonary Embolism	1.2% (1)	1.2% (1)	1
Ventilator > 48 Hours	3.6% (3)	3.6% (3)	1
Postoperative Sepsis	2.4% (2)	1.2% (1)	0.56
Unplanned Return To OR	0% (0)	13.3% (11)	0
Still in Hospital > 30 Days	1.2% (1)	1.2% (1)	1
30 Day All Cause Readmission	6.1% (5)	3.7% (3)	0.48

Table of complications by surgical approach.

Quick Shot Paper #54
January 18, 2019
8:39 am

ESTABLISHING THE LIMITS OF AGGRESSIVE RESUSCITATION IN PATIENTS WITH GUNSHOT WOUNDS TO THE BRAIN - AN EAST MULTICENTER STUDY

Leigh A. Robinson, MD, Bryce R.H. Robinson, MD, MS, FACS, FCCM*, Joshua G. Corsa, MD*, Michael G. Mount, DO*, Amy Hamrick, MSN, APRN, John D. Berne, MD*, Dalier Mederos, MD, Allison G. McNickle, MD*, Paul J. Chestovich, MD, FACS*, Jason Weinberger, DO*, Areg Grigorian, MD, Jeffry Nahmias, MD, MHPE, FACS*, Jane Kayle Jaein Lee, MD*, Kevin Chow, MD*, Erik Olson, MD*, Jose L. Pascual, MD, PhD, FRCS(C), FACS, FCCM*, Rachele Solomon, Danielle A. Pigneri, MD*, Husayn A. Ladhani, MD, Joanne Fraifogle, MD, Jeffrey A. Claridge, MD, MS, FACS*, Terry Curry, RN, Todd Costantini, MD, FACS, Manasnun Kongwibulwut, MD, Haytham Kaafarani, MD, MPH*, Janika San Roman, MPH, Craig Schreiber, MD, Anna Goldenberg-Sandau, DO*, Parker Hu, MD*, Patrick L. Bosarge, MD*, Rindi Uhlich, MD*, Nicole Lunardi, MD, Farooq Usmani, MS, Joseph V. Sakran, MD, MPH, MPA, FACS*, Jessica Babcock, MD, Lawrence Lottenberg, MD*, Donna Cabral, MSBI, BSN, Grace Chang, MD*, Jhoanna Gulmatico, MSN, APN, TCRN, Jonathan Parks, MD*, Rishi Rattan, MD*, Jeniffer Massetti, ACNP, Onaona Gurney, MD*, Brandon Bruns, MD, FACS*, Alison A. Smith, MD, PhD, Chrissy Guidry, MD*, Matthew E. Kutcher, MD*, Melissa Logan, MD*, Michelle Kincaid, MD*, M. Chance Spalding, DO, PhD*, Robert D. Winfield, MD, FACS*
University of Kansas Health System

Presenter: Leigh A. Robinson, MD

Objectives: Gunshot wounds to the brain (GSWB) confer high lethality and uncertain recovery. An immediate question is whether or not patients with GSWB undergoing CPR during trauma resuscitation have potential for survival or organ donation. The purpose of this study was to determine the rates of survival and organ donation in this patient population.

Methods: A retrospective, multicenter study at 22 US trauma centers was performed between June 1, 2011 and December 31, 2017. Patients were included if they suffered isolated GSWB and required CPR at a referring hospital, in the field, or in the trauma resuscitation room. Patients were excluded for significant torso or extremity injuries, or if pregnant. Crude survival and organ donation rates were calculated, bivariate correlations and multivariate logistic regression were completed to determine factors associated with survival/organ donation.

Results: 729 patients met study criteria; the majority were male (87%) with a mean age of 37 years. Most (71%) underwent CPR in the field. 1.8% (n=13) survived to discharge; 23% (n=169) survived to become potential organ donors, with an overall donation rate of 9.1% (n=67). Multivariate regression identified volume of plasma administered in the trauma center [OR 1.411, 1.055-1.887, p=0.020], use of thyroid hormone [OR 83.139, 3.632-1902, p=0.006] and insulin [OR 0.015, 0.001-0.164, p=0.001], and non-transfer status [OR 0.125, 0.024-0.649, p=0.013] as being significantly associated with survival, while methylprednisolone use [OR 7.043, 1.769-28.037, p=0.006] was associated with organ donation.

Conclusions: GSWB patients requiring CPR infrequently survive; however, organ donation rates are promising. Plasma and hormone utilization are favorably associated with survival and organ donation and represent potential therapeutic measures in treatment algorithms in this devastating clinical condition.

Paper #24
January 18, 2019
10:00 am

INFECTION AFTER PENETRATING BRAIN INJURY: AN EASTERN ASSOCIATION FOR THE SURGERY OF TRAUMA MULTICENTER TRIAL

Laura Harmon, MD*, Daniel Haase, MD, Donna Cabral, MSBI, BSN, Lawrence Lottenberg, MD*, Kyle Cunningham, MD, MPH*, Stephanie Bonne, MD*, Jessica Burgess, MD*, James Etheridge, MD, Gregory Semon, DO*, Matthew R Noorbakhsh, MD*, Benjamin Cragun, MD, Jennifer Rehbein, MD, Vaidehi Agrawal, PhD, Michael Truitt, MD*, Joseph H Marcotte, MD, Anna Goldenberg-Sandau, DO*, Natasha Keric, MD*, Peter M Hammer, MD*, Milad Behbahaninia, MD, Stephanie Savage, MD, MS*, Jeffry Nahmias, MD, MHPE, FACS*, Areg Grigorian, MD, David Turay, MD, PhD*, Vikram Chakravarthy, MD, Priti Lalchandani, MD, Dennis Y. Kim, MD, FRCSC, FACS, FCCP*, Julie A. Dunn, MS, MD*, Kevin Martin, BS, Victor Portillo, MD*, Thomas J. Schroeppel, MD*, Emma Callaghan, BS, Deborah M. Stein, MD, MPH, FACS, FCCM*, R Adams Cowley Shock Trauma Center, University of Maryland School of Medicine

Presenter: Laura Harmon, MD

Discussant: Mayur B. Patel, MD, MPH, Vanderbilt University Medical Center

Objectives: Fatality rates following penetrating traumatic brain injury (pTBI) are extremely high and survivors are often left with significant disability. Infection following pTBI is associated with worse morbidity. The rate of central nervous system infections (CNSI) in survivors is unknown. This study sought to determine the rate of and risk factors for CNSI following pTBI and to determine the impact of antibiotic prophylaxis.

Methods: This is a retrospective review at 17 institutions with adult patients surviving pTBI greater than 72 hours, from 2006 - 2016. Patients were stratified by the presence of CNSI and use of prophylactic antibiotics. The study was powered at 85% to detect a difference in infection rate of 5%. Primary endpoint was the impact of prophylactic antibiotics on CNSI. Mantel-Haenzel and Pearson's Chi square tests were used to compare categorical variables. P-values below 0.2 were included in a logistic regression adjusted for center.

Results: 763 patients with pTBI were identified over 11 years. 7% (n=51) of patients developed a CNSI. 66% of CNSI patients received prophylactic antibiotics. 62% of all patients received greater than 1 dose of prophylactic antibiotics and 50% of patients received extended antibiotics. Degree of dural penetration did not appear to impact the incidence of CNSI (p=0.10) nor did trajectory through the oropharynx (p=0.18) (Table 1). Controlling for other variables there was no statistically significant difference in CNSI with the use of prophylactic antibiotics (p=0.5). Patients with ICP monitors and patients with surgical intervention were each more than twice as likely to develop infection (Odds ratio = 2.27 and 2.60, respectively) (table 2).

Conclusions: There is no reduction in CNSI with prophylactic antibiotic use in pTBI. Surgical intervention and invasive ICP monitoring appear to be risk factors for INF irrespective of prophylactic use.

Table 1: Bivariate analysis of factors impacting infection rate after penetrating brain injury

	CNS Infection	No CNS Infection	P
Sex			
Male	45(7%)	603 (93%)	
Female	6 (5%)	109 (94%)	0.49
Prophylactic antibiotics	34 (7%)	441 (93%)	
No prophylactic antibiotics	17 (6%)	271 (94%)	0.50
Degree of Dural Penetration			
Local	15(5%)	293 (95%)	
Extensive	36 (8%)	419 (92%)	0.09
Trajectory			
Includes oropharynx	25 (8%)	281 (91%)	
Excludes oropharynx	24 (4%)	16 (5%)	0.18
Retained foreign body	35 (7%)	444(93%)	
No retained foreign body	16 (5%)	268 (95%)	0.37
ICP monitor*	27(12%)	196 (88%)	
No ICP Monitor	24 (4%)	516 (96%)	<0.0001
Operative intervention**	37 (10%)	328 (90%)	
No operative intervention	13 (3%)	383 (97%)	<0.0001

*intra-parenchymal or intraventricular, **craniotomy or craniectomy

Table 2: Multivariable analysis of the factors contributing to secondary infection after penetrating brain injury.

	Odds Ratio	Confidence Interval	P
Prophylactic antibiotics	0.76	0.38-1.5	0.43
Institution	0.97	0.89-1.04	0.32
ICP monitor	2.27	1.18-4.4	0.01
Operative intervention	2.60	1.3-5.6	0.01

Scientific Session IV-A

Paper #25
January 18, 2019
10:20 am

A CONCOMITANT LONG BONE FRACTURE WORSENS TRAUMATIC BRAIN INJURY RECOVERY: A TIME DEPENDENT PROCESS

Yujin Suto, MD, PhD, Syed Ahmed, MD, Christina Jacovides, MD*,
Abigail Roche, Maura Weber, Victoria Johnson, MD, PhD, Ryan Leone,
Lewis J. Kaplan, MD, FACS, FCCM, FCCP*, Douglas Smith, MD,
Tetsushi Ogawa, Jose L. Pascual, MD, PhD
University of Pennsylvania

Presenter: Yujin Suto, MD, PhD

Discussant: Jeffrey J. Skubic, DO, University of Texas - Rio Grande Valley

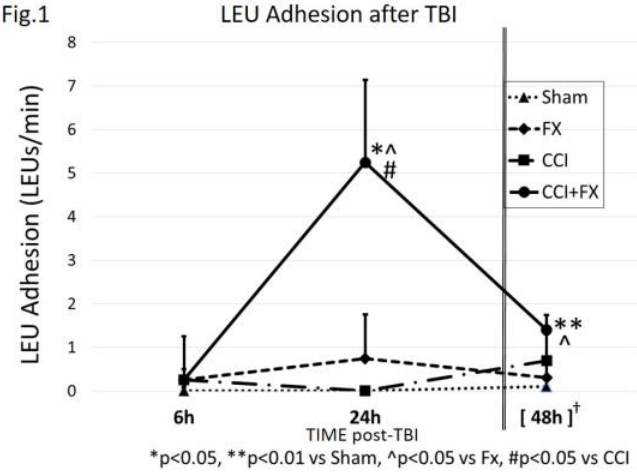
Objectives: A concomitant long bone fracture (Fx) worsens TBI-induced leukocyte (LEU) mediated cerebral edema, worsening late cognitive recovery. Understanding the timing of peak cerebral leukocyte mobilization and microcapillary leak may inform intervention nature and timing to improve TBI outcomes. We hypothesized that after TBI, 1) *in vivo* LEU mobilization and cerebrovascular permeability is time-dependent and 2) a concomitant Fx accelerates these processes.

Methods: CD1 male mice underwent TBI (controlled cortical impact, CCI) or sham craniotomy +/- tibial fracture. Randomization defined 4 groups (Sham, Fx, CCI, or CCI+Fx; n=5/group). Neurological recovery (Garcia Neurological Test, [GNT]) was assessed 6/24h post-injury. In vivo penumbral pial intravital microscopy assessed circulating LEUs and microvascular permeability. Brain wet-to-dry ratio (edema) was measured after sacrifice. Results were compared to our previously presented cohort (48-hours), using identical methodology/groups. ANOVA with Tukey's correction determined intergroup significance ($p<0.05$).

Results: 6h after TBI, GNT scores were depressed in CCI and CCI+Fx as compared to Sham or Fx ($p<0.05$). LEU adherence peaked in the CCI+Fx group at 24h, decreasing at 48h (Fig1) while brain edema continued to increase in the CCI+Fx group up to 48h (Fig2). CCI+Fx displayed greater microvascular leakage than Fx alone (65.0+4.3 vs. 41.8+7.5%, $p=0.044$). At 48-hours, CCI+Fx animals demonstrated greater LEU rolling and worse GNT scores and brain edema than CCI alone ($p<0.05$) despite similar LEU adherence.

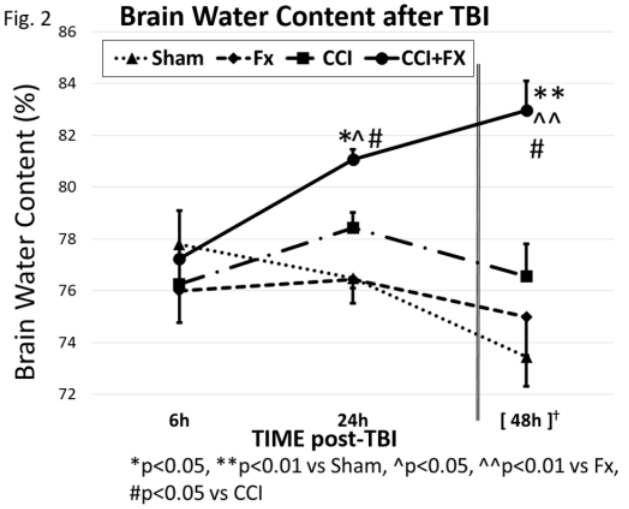
Conclusions: Leukocyte-mediated brain injury is intensified by a concomitant Fx, with a peak effect evident between 24h to 48h after TBI. This mechanism appears distinct from LEU-mediated inflammation as no increase in LEU adherence was noted after combining both TBI and Fx at 48h despite depressed neurologic recovery in animals with a concomitant Fx.

Fig.1



Compared to CCI alone, LEU endothelial adhesion on in vivo intravital microscopy at 24h after TBI, was significantly worse if CCI was accompanied by a bone fracture. []†:48 hour results alone were presented at the Western Surgical Association Conference, Nov 4, 2017, Scottsdale, Arizona

Fig. 2



Compared to CCI alone, brain edema at 24h and 48h after TBI was significantly greater if CCI was accompanied by a bone fracture. []† 48 hour results alone were presented at the Western Surgical Association Conference, Nov 4, 2017, Scottsdale, Arizona

Paper #26
January 18, 2019
10:40 am

OPTIMIZING ENERGY EXPENDITURE AND PULMONARY MECHANICS TO DECREASE VENTILATOR AND ICU DAYS

Darwin Ang, MD, PhD, MPH, FACS*, Alejandro J. Garcia, MD, Jason P. Farrah, MD*, Jason Clark, MD, Joshua D. Hagan, MD*, Carrie Watson, DO, Winston Richards, MD, Huazhi Liu, MS, Jason Barde, RRT, Ted Alderman, RRT
Ocala Health

Presenter: Darwin Ang, MD, PhD, MPH, FACS

Discussant: Martin Avery, MD, Wake Forest Baptist Health

Objectives: Measuring energy expenditure among critically ill patients has been used to monitor patient response to metabolic stress and optimizing nutrition. It is generally accepted that overfeeding leads to failure to wean from the ventilator due to an excess of CO2 and underfeeding leads to overall malnutrition and weakness. The aim of our study is to determine if optimizing the patient's daily energy expenditure and pulmonary mechanics for oxygenation (FRC) in conjunction with a ventilator weaning protocol would decrease number of ventilator days and improve overall outcomes.

Methods: This is a single institution prospective cohort study of ventilator dependent patients in a trauma ICU. Patients were placed on a standardized ventilator weaning protocol with additional daily measurements of the energy expenditure in the form of a respiratory quotient (RQ). The goal was to keep their RQ between 0.7 and 1.0, based on their calculated caloric needs derived from our rounding dietician. For comparison, a historical cohort was used to compare outcomes to the study group. The historical group had the same weaning protocol. The duration of the study was 21 months from August 2016 to April 2018.

Results: A total of 420 patients were in the study group and 400 in the historical control group. There were no baseline differences in age, gender, or injury severity. Patients with the optimized energy expenditure had a lower mean number of ventilator days (4.3 vs. 7.2 days, p-value 0.0001). These patients also had a lower mean ICU (8.1 vs. 10.3 days, p-value 0.0001) and overall hospital LOS (12 vs. 17 days p-value 0.0007).

Conclusions: Including the optimization of the energy expenditure (RQ) and pulmonary mechanics for oxygenation (FRC) of the critically ill patient who is ventilator dependent may improve the number ventilator days and thus resulting a lower length of stay in both the ICU and hospital.

Paper #27
January 18, 2019
11:00 am

MULTI-ORGAN FAILURE IN ARDS: EFFECTS OF ADJUNCT TREATMENTS ON END-ORGAN DAMAGE AND HISTOLOGICAL INJURY SEVERITY

Jae H. Choi, PhD, DVSc, Corina Necsoiu, MD, Daniel Wendorff,
Bryan Jordan, RN, MS, Alexander Dixon, Teryn Roberts, Brendan Beely,
Leopoldo C. Cancio, MD, FACS*, Andriy Batchinsky, MD,
US Army Institute of Surgical Research

Presenter: Jae H. Choi, PhD, DVSc

Discussant: Matthew E. Kutcher, MD, University of Mississippi Medical Center

Objectives: We investigated effects of mesenchymal stem cells (MSC) or low-flow extracorporeal life support (ECLS) as forms of treatment for ARDS by SII and 40% TBSA burns by assessing their effects on histological injury scores. We hypothesized that adjunct treatments decrease histological end-organ damage.

Methods: Anesthetized female Yorkshire swine randomized to one of six groups: CTRL (no injury, $n = 4$), INJ (injured untreated, $n = 8$), Auto (injured treated with autologous MSC, $n = 10$), Allo (injured treated with allogenic MSC, $n = 10$), Hemolung (HL, $n = 10$), and NovaLung (NL, $n = 7$). Scores from Lung: diffuse alveolar damage scores (DAD); Kidney: glomerular injury (GI), proximal convoluted tubule damage (PCT), distal convoluted tubule damage (DCT), granulated protein deposition (PD); Liver: congestion, thrombosis, apoptosis, degeneration, inflammation. Statistics by SAS Cary, NC, v. 9.4, significance at $p<0.05$; data are represented as mean±SEM.

Results: MSC groups had significantly lower DAD scores than INJ animals (Allo, 26.6±3.4 and Auto, 18.9±1.5 vs. INJ, 46.8±2.1, $p<0.001$). MSC animals had lower DAD scores than ECLS animals (Allo vs NL, $p<0.05$, Allo v HL $p<0.001$, Auto v NL $p<0.001$, Auto v HL, $p<0.001$). Kidney injury, INJ ($p<0.05$) and HL ($p<0.01$) were higher than CTRL. HL animals had higher kidney injury GI (2.7±0.3 v 1.2±0.1, $p<0.001$); PCT (2.7±0.3 v 1.1±0.3, $p<0.001$), and DCT (1.4±0.2 v 1.0±0.3, $p = 0.01$) than Auto. HL had higher levels of GI (2.7±0.3 v 1.5±0.2, $p<0.001$) and PCT (2.7±0.3 v 1.4±0.2, $p<0.001$) than Allo. Liver damage, both HL (1.6±0.2, $p<0.05$) and INJ (1.7±0.2, $p<0.05$) showed higher injury scores vs.CTRL animals. DAD was present in all injured groups. Auto was most effective in mitigating ARDS and MOF severity, followed by Allo, then NL.

Conclusions: Further studies are required to elucidate the role of combination therapies of MSC and ECLS as treatments for ARDS and MOF.

Paper #28
January 18, 2019
11:20 am

EXTERNAL VALIDATION OF A NOVEL DIGITAL SIGNATURE TO DETECT EARLY RESPIRATORY DETERIORATION OF ICU PATIENTS

Rachael A. Callcut, MD, MSPH, FACS*, Yuan Xu, BS, Christina Tsai, BS, Andrea Villaroman, B.Eng., MTM, Anamaria J. Robles, MD, Doug Lake, PhD, Matthew Clark, PhD, Randall Moorman, MD, Xiao Hu, PhD,
University of California San Francisco

Presenter: Rachael A. Callcut, MD, MSPH, FACS

Discussant: David Meyer, MD, MS, University of Texas Health Sciences Center

Objectives: By leveraging the growth in digital technology paired with graphical visualization, early warning signals displayed at the bedside could aid providers in identifying subtle but precise changes in patient condition. Earlier identification of those at risk for respiratory deterioration could create opportunities to intervene and mitigate factors contributing to poor outcome.

Methods: We validated predictive models for respiratory decompensation resulting in emergent intubation. The validation cohort consisted of all patients admitted to any ICU at an external site over a 2-year period. Continuous risk estimates were calculated using correlations of HR, RR, SO2, BP, and entropy measures of cardiac inter-beat intervals from continuous physiologic monitoring data archived by BedMaster®. Timing and classification (planned, unplanned) of intubation events were determined by chart review. Models were evaluated by (1a) testing for a significant rise in predicted risk leading up to unplanned intubation, (1b) calculating area under the curve (AUC) with bootstrapped confidence intervals, and (1c) verifying calibration.

Results: In the validation cohort, amongst 9,828 admissions, there were 240 episodes of emergent intubation in 238 patients. Risk estimates rose significantly (red points) and steadily, tripling over the 24 hours prior to emergent intubation (Figure 1a). AUC was significant and increased leading up to the event (1b). Importantly, the model is well-calibrated (predicted risk equals observed risk) with deviation from the line of identity only in the highest and lowest deciles of predicted risk (1c).

Conclusions: Subtle signatures of respiratory decompensation leading to emergent intubation are consistent across institutions and may provide a useful adjunct to clinicians to mitigate need for emergent intubation.

Figure 1a

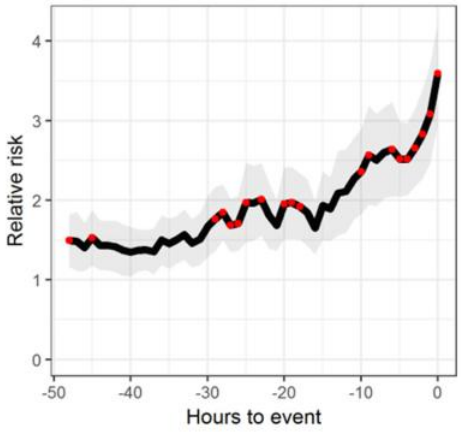


Figure 1b

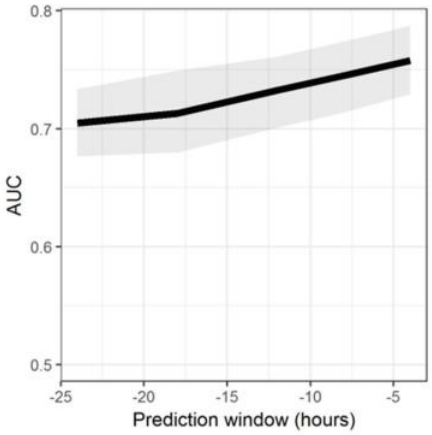
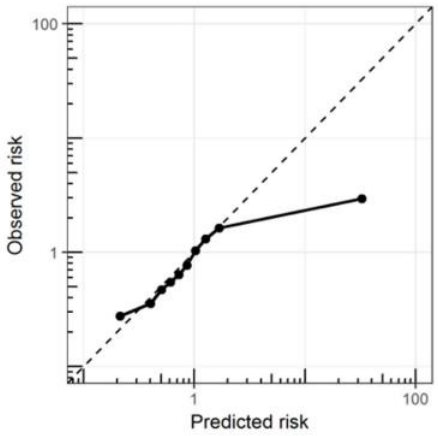


Figure 1c



Paper #29
January 18, 2019
12:00 pm

THE ACUTE INFLAMMATORY RESPONSE AFTER TRAUMA IS HEIGHTENED BY FRAILTY: A PROSPECTIVE EVALUATION OF INFLAMMATORY AND ENDOCRINE SYSTEM ALTERATIONS IN FRAILTY

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Mohammad Hamidi, MD, Andrew L. Tang, MD*, Terence O'Keeffe, MD, MSPH*,
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The University of Arizona

Presenter: James Palmer, MS

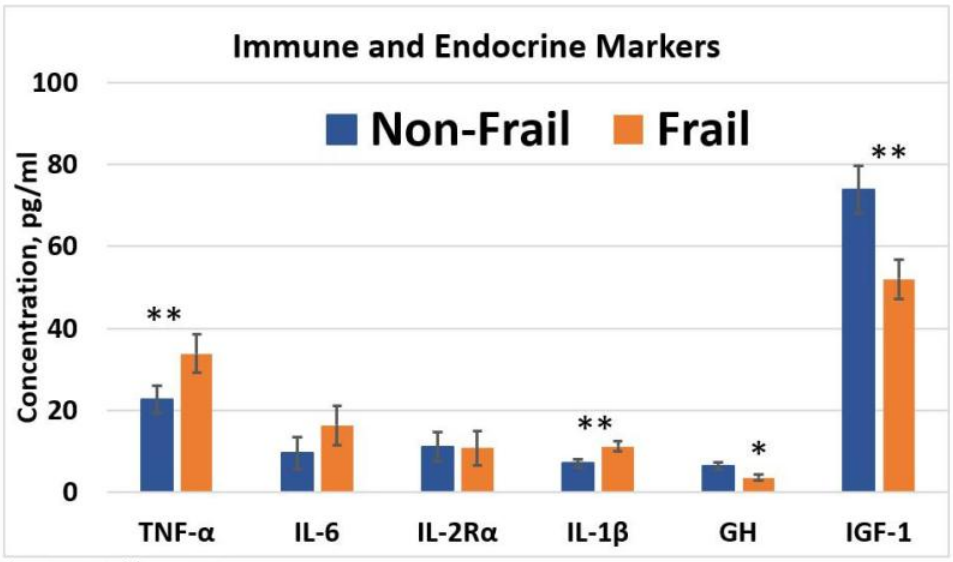
Discussant: Scott C. Brakenridge, MD, MSCS, University of Florida

Objectives: Frailty is a geriatric syndrome described as a state of decreased physiological reserve with increased inflammation and decrease anabolic endocrine response. We aimed to analyze the association of frailty with immune (IL-1β IL-6, IL-2Ra, TNF-a) and endocrine markers (IGF-1, growth hormone[GH]).

Methods: 1-year(2017) prospective analysis of geriatric(=65y) trauma patients admitted to our level 1 trauma center. Frailty was measured using trauma specific frailty index(TSFI) within 24hrs of admission. Patients were stratified into two groups: frail(TSFI>0.25) & non-frail(TSFI=0.25). We measured levels of immune and endocrine biomarkers by colorimetric output that was read by spectrophotometer(Quantikine® ELISA) within 24 hours of injury

Results: 60 geriatric trauma patients were enrolled. Median age was 72[65-85], 55% were females. Median ISS was 11[9-17] and median FI was 0.24[0.03-0.75]. 31 patients were frail. Frail patients were more likely to present after falls(74% vs 54%) vs non-frail. There was no difference between age(p=0.78), gender(p=0.77), race(p=0.98), ISS(p=0.71), SBP(p=0.85), and heart rate(p=0.91) between the two groups. Frail patients had higher levels of TNF-a(33.9 vs 22.7pg/ml,p=0.01), and IL-1?(10.8 vs 7.1pg/ml,p=0.01) and lower levels of GH (3.6 vs 6.5ng/ml,p=0.03) and IGF-1(52 vs 74pg/ml,p<0.01) compared to non-frail patients. There was no difference in IL-6(p=0.27) and IL-2Ra(p=0.95).

Conclusions: This study supports the association between immune & endocrine markers and frailty. Frailty acts synergistically with trauma in increasing the acute inflammatory response among geriatric patients. Moreover, frail patients have lower levels of anabolic hormones like growth hormone and insulin like growth factor-1. Understanding the inflammatory and endocrine responses in frail trauma patients may result in better therapeutic strategies



*=$p<0.05$, **=$p<0.01$

Figure 1. Immune and Endocrine Markers

Paper #30
January 18, 2019
10:00 am

MULTICENTER STUDY OF THE TREATMENT OF APPENDICITIS IN NORTH AMERICA: ACUTE, PERFORATED, AND GANGRENOUS (MUSTANG) - AN EAST MULTICENTER STUDY

D. Dante Yeh, MD, FACS*, Ahmed I. Eid, MD, MSc, Jeffrey Wild, MD*, Katelyn Young, BS, Haytham Kaafarani, MD, MPH*, Ryan A. Lawless, MD*, Alexis Cralley, MD, Martin D. Zielinski, MD, FACS*, Marie L. Crandall, MD, MPH*, Mohamed D. Ray-Zack, MBBS, Jonathan M. Saxe, MD*, Lewis E. Jacobson, MD, FACS*, Georgia Vasileiou, Stacie Allmond, DO, Bruce Long, MD, George Kasotakis, MD, MPH*, Sean Perez, BS, Maryam Tabrizi, MD*, Bellal Joseph, MD*, Muhammad Zeeshan, MD, Daniel C. Cullinane, MD*, Richard D. Catalano, MD*, David Turay, MD, PhD*, Christopher Dodgion, MD, MSPH, MBA*, Savo Bou Zein Eddine, MD, Ali Fuat Kann Gok, MD, Jocelyn To, BS, Jeffry Nahmias, MD, MHPE, FACS*, Beatrice Sun, BS, Rondi Gelbard, MD*, Crystal Szczepanski, MSN, NP-C*, Reginald Alouidor, MD*, Kailyn Kwong Hing, MD, Victoria Sharp, DO*, Kelly Dinnan, DO, FACOS*, Erik Teicher, MD, Elena Lita, BS, David S. Morris, MD, FACS*, Laura Juarez, PA-C, David C. Evans, MD, FACS*, Daniel Vazquez, MD, MSc, FACS*, Victor Portillo, MD*, Morgan L. Collom, DO, Jason D. Pasley, DO, FACS*, Amelia Pasley, DO*, Jennifer Mull, MSN, RN, CCRC, Brandon Behrens, MD, Andy Goodman, BS, Carlos J. Rodriguez, DO, MBA, FACS*, Matthew J. Bradley, MD*, Steven Eyer, MD, Kaitlyn Poulx, PA
Ryder Trauma Center, University of Miami Miller School of Medicine

Presenter: D. Dante Yeh, MD, FACS

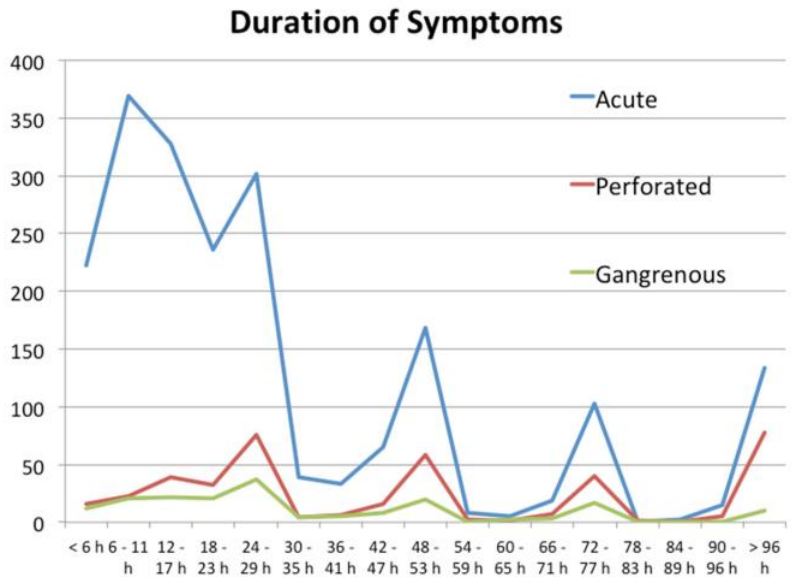
Discussant: Rachael A. Callcut, MD, MSPH, UCSF - San Francisco General Hospital

Objectives: We sought to describe contemporary presentation, treatment, and outcomes of patients presenting with acute (A), perforated (P), and gangrenous (G) appendicitis.

Methods: This multicenter prospective observational study enrolled adults with appendicitis from 01/17-05/18. Demographics, history of present illness, physical exam, and radiographic/intraoperative/pathologic findings were collected. Descriptive statistics were performed. P and G were combined into a "complicated" outcome variable and risk factors were assessed using multiple logistic regression.

Results: A total of 3035 subjects were enrolled across 27 sites. Mean age was 41 (17) years, 1518 (53%) were male, 90% underwent CT imaging, 91% were initially treated by appendectomy (94% laparoscopic), and median length of stay was 1 [1-2] d. The 30 d rates of ED visit and hospital readmissions were 10% and 5%. Of 164 initially treated with antibiotics, 30 (18%) required appendectomy during index hospitalization and 12 (9%) required appendectomy within 30 d of discharge, for an overall 30 d failure rate of 26%. Overall, 2048 (78%) patients had A while 404 (15%) and 182 (7%) patients had P and G, respectively. Symptom duration had a trimodal distribution (**Figure**). On regression analysis, age, symptoms >48 h, temperature, WBC, Alvarado score, and appendicolith were predictive of "complicated" appendicitis whereas Charlson Comorbidity Index, tobacco use, and ED triage to appendectomy > 6 h or >12 h were not (**Table).**

Conclusions: In the United States, the majority of patients presenting with suspected or confirmed appendicitis receive CT imaging, undergo laparoscopic appendectomy, and stay in the hospital for 1 d. Failure of antibiotic therapy is common. Patients with "complicated" appendicitis are older and have had symptoms for longer but delay in appendectomy after hospital presentation is not a risk factor.



Duration of symptoms prior to hospital presentation had a trimodal distribution for acute, perforated, and gangrenous appendicitis.

Independent variable	OR (95% CI)	P
Age	1.05 (1.04 – 1.06)	<0.001
Charlson Comorbidity Index	0.95 (0.86 – 1.04)	0.250
Current/Former Tobacco use	1.19 (0.96 – 1.48)	0.107
Duration of Symptoms >48 h	2.71 (2.18 – 3.37)	<0.001
ED Triage to Appendectomy > 6 h	0.86 (0.67 – 1.11	0.245
ED Triage to Appendectomy > 12 h	1.08 (0.87 0 1.35)	0.272
Temperature	1.70 (1.43 – 2.02)	<0.001
WBC	1.07 (1.04 – 1.10)	<0.001
Alvarado score	1.17 (1.08 – 1.27)	<0.001
Appendicolith	1.88 (1.52 – 2.32)	<0.001

Multiple logistic regression analysis to predict "complicated" (perforated or gangrenous) appendicitis.

Paper #31
January 18, 2019
10:20 am

RE-EXAMINING "NEVER LETTING THE SUN RISE OR SET ON A BOWEL OBSTRUCTION" IN THE ERA OF ACUTE CARE SURGERY

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The Ohio State University

Presenter: Adrian Diaz, MD, MPH

Discussant: Brian Yorkgitis, PA-C, DO, University of Florida-Jacksonville

Objectives: Implementation of Acute Care Surgery (ACS) has increased access to round the clock (RTC) emergency general surgery (EGS) care. We examined if ensuring timely access to operation affects small bowel obstruction (SBO) outcomes.

Methods: We surveyed 2,811 US hospitals on EGS practices, including how OR access is assured (e.g., staffing, block time). 1,690 hospitals (60%) responded. Data was anonymously linked to State wide Inpatient Sample data (16 states) using American Hospital Association identifiers. We measured operations, mortality, complications and discharge to another acute care hospital for adults admitted emergently with SBO. Univariate and multivariable regression analyses, clustered by treating hospital and adjusted for patient factors, were performed to examine multiple variables related to OR access.

Results: We identified 29,579 SBO admissions in 2015. Patients were largely white (72%) females (57%) of median age 66yrs (IQR54,77); 16% required operation. Mortality was <2% with 38% complications. Table 1 shows proportion of patients exposed to hospital-level OR access variables. In multivariable analyses (Table 2), operation was more likely at hospitals lacking: processes to defer elective cases, in-house OR staff at night and surgeons with trauma/cc responsibilities providing care at a single location. Transfer to another hospital was more likely when surgeons covering EGS were: working shifts, taking home call and relying on OR staff on home call. No OR access variables consistently predicted differences in mortality or complications.

Conclusions: Focused EGS resources as typically organized within ACS models are associated with higher likelihood of non-operative management of SBO and lower rates of transfers. Given the frequency of SBO these findings have implications for the dissemination of ACS and triage criteria for patients with SBO.

Table 1. Proportion of SBO patients (N = 29,579) exposed to hospital-level resources, policies, and procedures to aimed at assuring access to surgical care at hospitals in 16 states in 2015 in bivariate comparisons	
Resource, Policy, or Procedure Aimed at Ensuring Access to Operation	% patients exposed
Operating Room Access	
Block Time for EGS (%)	
None	62.3
<1 day	1.8
1 day	1.1
2 days	0.9
3 days	0.9
4 days	2.4
5 days	18.1
>5 days	9.9
Tiered system for booking emergent surgical cases (yes %)	79.6
Process to defer elective cases (yes %)	78.4
Overnight OR access available (yes %)	99.8
Surgical Coverage	
Daytime surgeons covering EGS free of other clinical duties (yes %)	24.5
Daytime surgeon on call for EGS working post-call (%)	
Always/Often	64.8
Sometimes	13.5
Rarely/Never	16.7
Daytime EGS coverage scheme (%)	
On-service for 5 days	6
On-service for 7 consecutive days	8.5
On-service for longer consecutive days	-
Daytime shifts 8 or more hours	14.2
24 hours of coverage	59.8
*Other**	2.1
In-house surgeon overnight for EGS (%)	
Always/Often	45.9
Sometimes	8.2
Rarely/Never	41.1
Overnight surgeon also responsible for covering trauma (%)	
Always/Often	61.9
Sometimes	5.0
Rarely/Never	28.4
Overnight surgeon also responsible for covering ICU care (%)	
Always/Often	34.6
Sometimes	10.3
Rarely/Never	50.6
Overnight surgeon also responsible for covering EGS at more than one hospital (%)	
Always/Often	13.5
Sometimes	12.5
Rarely/Never	68.7
Overnight Staffing	
Overnight scrub techs (%)	
None	0.1
On-call	47.8
In-house	52.1
Overnight OR nurses (%)	
None	-
On-call	47.2
In-house	52.8
Overnight recovery room nurses (%)	
None	1.6
On-call	70.0
In-house	28.4
Overnight anesthesia staff (MD, DO, CRNA) (%)	
None	2.8
On-call	45.0
In-house	52.2

Proportion of SBO patients (N = 29,579) exposed to hospital-level resources, policies, and procedures to aimed at assuring access to surgical care at hospitals in 16 states in 2015 in bivariate comparisons

Table 2. Adjusted and unadjusted odds ratios for needing an operation and transfer to another acute care hospital among 29,579 patients admitted with SBO at to 441 Hospitals in 16 States across the United States based on resources, policies, and procedures for optimizing operating room access				
OR Access Resource, Policy, or Procedure	**Operation**		**Transfer**	
Operating Room Access				
	OR	aOR	OR	aOR
Block Time for EGS				
≥5 days (5, >5) (ref)	--		--	--
2-4 days (2, 3, 4)	2.03 (0.96, 1.11)		0.84 (0.47, 1.48)	
≤1 day (none, <1, 1)	0.99 (0.84, 1.16)		0.44 (0.34, 0.56)*	0.44 (0.34, 0.58)**
Tiered system for booking emergent surgical cases				
Yes (ref)	--	--	--	--
No	1.09 (1.01, 1.19)*	1.06 (0.96, 1.16)	0.60 (0.49, 0.74)*	0.58 (0.46, 0.72)**
Process to defer elective cases				
Yes (ref)	--	--	--	--
No	1.13 (1.04, 1.23)*	1.14 (1.04, 1.25)**	0.69 (0.56, 0.85)*	0.66 (0.52, 0.82)**
Surgical Coverage				
Daytime surgeons on call for EGS free of other clinical duties				
Yes (ref)	--		--	--
No	1.06 (0.98, 1.14)		0.52 (0.40, 0.66)*	0.44 (0.33, 0.59)**
Daytime surgeon on call for EGS working post-call				
Always/Often (ref)	--	--	--	
Sometimes	0.88 (0.81, 0.97)*	0.89 (0.80, 0.99)**	2.80 (1.95, 4.02)*	
Rarely/Never	0.81 (0.75, 0.88)*	0.87 (0.79, 0.96)**	3.36 (2.36, 4.80)*	
Daytime EGS coverage scheme (%)				
On-service for 5 or more days (5, 7, longer) (ref)	--		--	--
Daytime shifts 8 or more hours	0.96 (0.85, 1.08)		1.75 (1.18, 2.58)*	1.91 (1.23, 2.96)**
24 hours of coverage	1.02 (0.93, 1.12)		0.93 (0.72, 1.20)	
Other	1.25 (0.98, 1.60)		0.63 (0.36, 1.09)	
In-house surgeon overnight for EGS				
Always/Often	--	--	--	--
Sometimes	1.13 (1.00, 1.28)		0.94 (0.64, 1.37)	
Rarely/Never	1.10 (1.03, 1.18)*	1.08 (1.00, 1.17)	1.93 (1.60, 2.34)*	1.88 (1.53, 2.31)**
Overnight surgeon also responsible for covering trauma				
Always/Often (ref)	--	--	--	--
Sometimes	1.19 (1.02, 1.38)*	1.21 (1.01, 1.46)**	1.41 (0.87, 2.27)	
Rarely/Never	1.17 (1.09, 1.26)*	1.16 (1.07, 1.26)**	0.89 (0.74, 1.08)	
Overnight surgeon also responsible for covering ICU care				
Always/Often (ref)	--	--	--	--
Sometimes	0.98 (0.88, 1.09)		1.11 (0.78, 1.58)	
Rarely/Never	1.21 (1.13, 1.30)*	1.15 (1.06, 1.24)**	0.69 (0.56, 0.84)*	0.67 (0.54, 0.84)**
Overnight surgeon also responsible for covering EGS at more than one hospital				
Always/Often (ref)	--	--	--	
Sometimes	0.88 (0.78, 1.00)		1.10 (0.76, 1.60)	
Rarely/Never	0.82 (0.74, 0.90)*	0.84 (0.75, 0.94)**	0.86 (0.66, 1.13)	
Overnight Staffing				
Overnight scrub techs				
In-house (ref)	--	--	--	--
On-call	1.17 (1.10, 1.25)*	1.13 (1.05, 1.22)**	3.32 (2.71, 4.07)*	3.6 (2.93, 4.61)**
Overnight OR nurses				
In-house (ref)	--	--	--	--
On-call	1.13 (1.06, 1.20)*	1.09 (1.01, 1.17)**	3.34 (2.73, 4.09)*	3.65 (2.91, 4.56)**
Overnight recovery room nurses				
In-house (ref)	--	--	--	--
On-call	1.13 (1.05, 1.21)*	1.10 (1.02, 1.20)**	2.95 (2.25, 3.87)*	3.20 (2.36, 4.33)**
Overnight anesthesia staff (MD, DO, CRNA)				
In-house (ref)	--		--	--
On-call	1.07 (1.00, 1.14)		2.26 (1.86, 2.76)*	2.46 (1.97, 3.07)**
*significant at unadjusted model (P < 0.05)				
**significant after being adjusted for age, race, sex, insurance status, Elixhauser index (P < 0.05)				

Adjusted and unadjusted odds ratios for needing an operation and transfer to another acute care hospital among 29,579 patients admitted with SBO at to 441 Hospitals in 16 States across the United States based on resources, policies, and procedures for optimizing operating room access

Paper #32
January 18, 2019
10:40 am

ESCALATION OF MORTALITY AND RESOURCE UTILIZATION IN EMERGENCY GENERAL SURGERY TRANSFER PATIENTS

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University of Kentucky

Presenter: David D. Keeven, BA, MS

Discussant: Nina Glass, MD, Rutgers-New Jersey Medical School

Objectives: To identify the mortality, morbidity and resource utilization burden of non-trauma transfers to emergency general surgery services.

Methods: Data was obtained for patients undergoing emergency general surgery, for the top ten procedures by volume, using public files from the American College of Surgeons National Surgery Quality Improvement Program for years 2012 and 2016 (Table 1). We analyzed risk factors and 30-day outcomes by transfer status using chi-square analysis and multivariable logistic regression. Significance was set at $p < .001$.

Results: A total of 101,244 procedures were identified. Transferred patients had increased clinical risk, operative complexity, and poorer outcomes. Fewer transfers were initiated for less technically sophisticated cases such as laparoscopic appendectomy and cholecystectomy while more complex acute open cases were transferred. Transfer patients required longer operations, more transfusions, incurred greater critical care complications identified as; prolonged and unplanned intubations, renal failure, treated pulmonary embolisms, sepsis, cardiac arrest, infarct, and stroke. Transfer patients returned to the operating room more often, had higher rates of readmission and greater 30-day mortality (Table 2). These effects remained after adjusting for procedure group, secondary procedures, age and ASA class.

Conclusions: Our study demonstrates significant differences in mortality, morbidity and resource burden of EGS transfer patients dependent upon the transferring facility that were not attributable to case mix, age and comorbid status alone. These data point to potential financial and quality assessment challenges of tertiary referral centers.

	Direct Admits	ED Transfers	Inpatient Transfers	Nursing Home Transfers
No. Pts.	88414	7098	4164	1568
Procedure Group				
Appendectomy, Lap.	44.6%	30.5%	15.0%	3.1%
Cholecystectomy, Lap.	9.9%	6.1%	9.3%	2.7%
Colectomy, partial	7.9%	12.8%	16.7%	21.2%
Enterectomy	4.2%	6.1%	7.2%	8.7%
Appendectomy, Open	3.0%	1.9%	1.0%	0.4%
Ventral Hernia Repair, Open	2.5%	3.2%	2.5%	3.3%
Enterolysis	2.1%	2.8%	3.0%	4.0%
Ileocolectomy	1.9%	3.7%	4.7%	4.7%
Exploratory Laparotomy	1.7%	2.8%	4.0%	5.4%
Gastrorrhaphy	1.6%	3.5%	2.2%	3.2%

Table1. The distribution of the top ten procedures (by volume) performed emergently on general surgery services varied with transfer status (chi-square $p < .001$).

Variable	Direct Admits	ED Transfers	Inpatient Transfers	Nursing Home Transfers	P-value[2]
No. Pts.	88414	7098	4164	1568	
30-d Mortality	3.2%	7.9%	12.6%	23.1%	<.001
Adjusted Odds Ratio[1]	1.0 Ref.	1.41*	1.59*	1.64*	
Operating Room Time > 2 hrs.	13.5%	21.1%	29.8%	26.3%	<.001
Adjusted Odds Ratio[1]	1.0 Ref.	1.17*	1.34*	0.87	
Transfusion w/in 72 h of incision	6.1%	12.5%	21.8%	28.5%	<.001
Adjusted Odds Ratio[1]	1.0 Ref.	1.18*	1.62*	1.32*	
Critical Care Complications	12.4%	23.7%	32.0%	46.1%	<.001
Adjusted Odds Ratio[1]	1.0 Ref.	1.32*	1.43*	1.47*	
Related Return to the OR	2.9%	4.7%	7.3%	7.8%	<.001
Adjusted Odds Ratio[1]	1.0 Ref.	1.11	1.36*	1.15	
Hospital Stay > 7 days, %	21.1%	33.2%	50.7%	66.4%	<.001
Adjusted Odds Ratio[1]	1.0 Ref.	1.00	1.61*	1.39*	
Unplanned Readmission	6.2%	7.3%	7.9%	15.1%	<.001
Adjusted Odds Ratio[1]	1.0 Ref.	0.93	0.88	1.50*	

Table 2. Emergency General Surgery Outcomes by Transfer Status

[1]*Adjusted for age, sex, ASA class, primary procedure group and secondary procedure work RVUs.* [2]P-value is for chi-square test of variation in outcome proportions across transfer status groups. *Adjusted odds ratio different than 1.0, $p < .001$.

Paper #33
January 18, 2019
11:00 am

THE AFTERMATH OF FIREARM VIOLENCE: SURVIVAL IS NOT "GOOD ENOUGH"

Michael Vella, MD*, Alex Warshauer, Garbriella Tortorello,
Joseph Fernandez-Moure, MD, MS*, Joseph Giacolone,
Bofeng CHen, Alex Cabulong, Kristen Chreiman, BSN,
Carrie A. Sims, MD*, C. William Schwab, MD*, Patrick M. Reilly, MD*,
Meghan Lane-Fall, MD, MSHP*, Mark J. Seamon, MD, FACS*
University of Pennsylvania

Presenter: Michael Vella, MD

Discussant: Robyn Richmond, MD, Texas Tech University

Objectives: The impact of American firearm injuries is devastating. While firearm mortality and costs have been investigated, the long-term effects of being shot on gunshot wound (GSW) survivors remain unstudied. We hypothesized that GSWs have a lasting impact on survivors and sought to determine their long-term functional, psychological, and social effects.

Methods: Attempts were made to contact adult patients (n=2041, ≥18yrs) discharged alive (2008-2018) from an urban, Level-I center after GSW. Demographics and clinical variables were assessed. Participants were evaluated with 8 PROMIS tools (Global Physical [GPH] and Mental Health, Physical Function [PF], Emotional Distress, Social Roles/Activities [SRA], Pain, Alcohol and Substance Use) and the Primary Care PTSD Screen. Raw scores were converted to standardized T-scores with PROMIS conversion tables and compared to the general US population (calibrated mean T-score=50).

Results: 214 GSW patients were reached, 151 (71%) participated. No differences were detected between participants and those who declined (Table). Participants (median time from GSW 5 [4-8] yrs) were primarily young (27 [21-25] yrs), Black (91%), males (93%) who were employed prior to GSW (76% vs after GSW 59%, p=0.002). Subjects often scored below population norms on PROMIS metrics (Figure) including GPH (45±12, p<0.001) and PF (45±12, p<0.001). 78 (52%) scored “probable” for PTSD. Patients requiring ICU admission (n=53) had worse PF (41 [30-60] vs 46 [38-60], p=0.013) and SRA (44 [37-64] vs 52 [44-64], p=0.011) than those not requiring ICU. Importantly, elapsed time from GSW did not correlate with PROMIS or PTSD results (<5 yrs vs >5 yrs, all p>0.05).

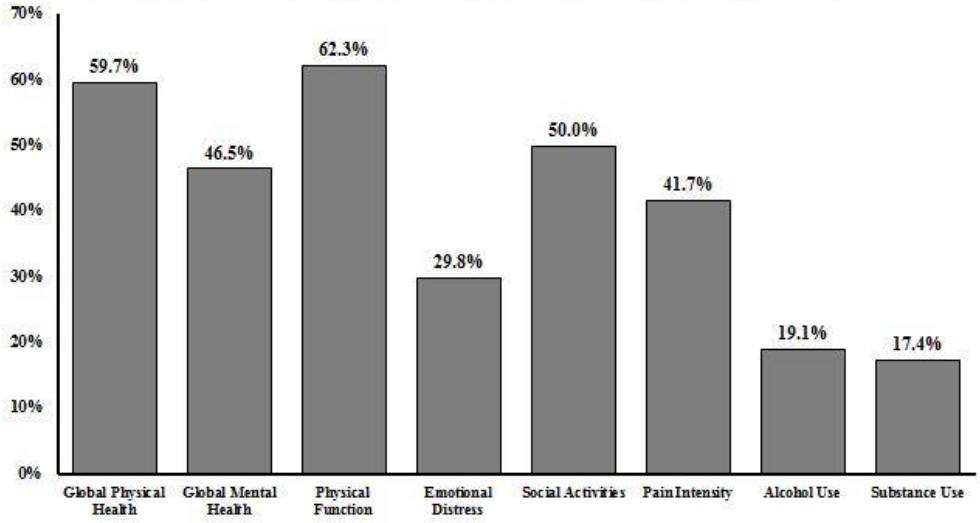
Conclusions: The lasting effects of firearm injury reach far beyond mortality and economic burden. GSWs negatively impact survivors for years following injury. Our results suggest early identification and initiation of long-term longitudinal care is paramount to GSW recovery.

Table: Demographics, Clinical and Social Characteristics

	Study Participants (n=151)	Declined Participation (n=63)	*p* value	Unreached (n=1827)	*p* value
Age at GSW (years)	27 [21-25]*	24 [21-24]	0.352	25 [21-32]	0.107
Time from GSW (years)	5 [4-8]	--	--		
Race (Black)	137 (91%)	52 (83%)	0.104	1670 (91%)	0.763
Sex (male)	140 (93%)	58 (92%)	1.000	1697 (93%)	0.870
ISS	9 [1-17]	9 [1-18]	0.516	5 [1-14]	0.042
Admitted to Hospital	117 (78%)	43 (68%)	0.170	1219 (67%)	0.007
Hospital LOS (days)	6 [3-13]	6 [4-14]	0.734	6 [2-11]	0.099
ICU LOS (days)	4 [1-15] (n=53)	4 [1-16] (n=22)	0.920	3 [1-5] (n=569)	0.017
Employed Pre-GSW	115 (76%)	--	--	--	--
Employed Post-GSW	89 (59%)	--	--	--	--
Return to Employment (months)	4 [1-12]	--	--	--	--
Alcohol/Substance Use Pre-GSW	50 (33%)	--	--	--	--
Alcohol/Substance Use Post-GSW	62 (41%)	--	--	--	--

Declined and unreached compared to study participants, * median [IQR]

Figure: Long-term Physical, Mental and Social Outcomes PROMIS Assessment Battery:
% of Gunshot Wound Survivors with Assessment Scores Worse than Population Norms



Paper #34
January 18, 2019
11:20 am

LOCATION, LOCATION, LOCATION: UTILIZING NBATS-2 IN TRAUMA SYSTEM PLANNING

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Presenter: Jennings H. Dooley, BS

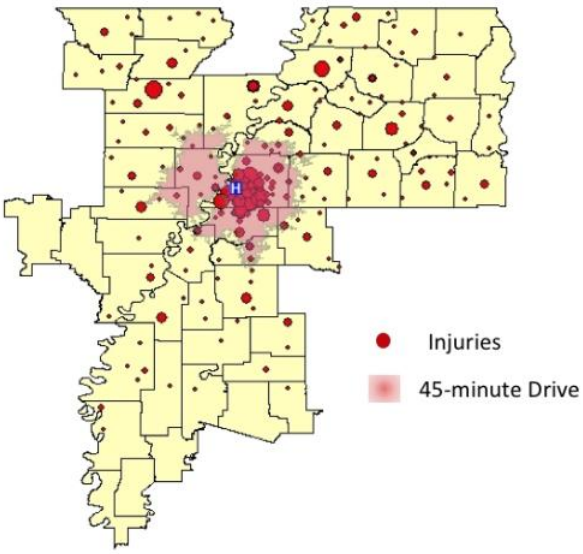
Discussant: Shelby Resnick, MD, Kaiser Permanente

Objectives: In 2015, the American College of Surgeons Committee on Trauma introduced the Needs-Based Assessment of Trauma Systems (NBATS) tool in an attempt to quantify the optimal number of trauma centers for a region. While some parts of the tool were useful, more focus was required on injury population, distribution, and transportation systems. Therefore, NBATS-2 was developed utilizing advanced geographical modeling. The purpose of this study was to evaluate NBATS-2 in a large regional trauma system.

Methods: All injured patients from 2016-2017 with an ISS > 15 were collected from the trauma registry of the existing (legacy) center. Injury location and demographics were analyzed by zip code. A regional map was built using US census data to include hospital and population demographic data by zip code. Spatial modeling was conducted using ArcGIS 10.6 to estimate an area within a 45-minute drive to a trauma center.

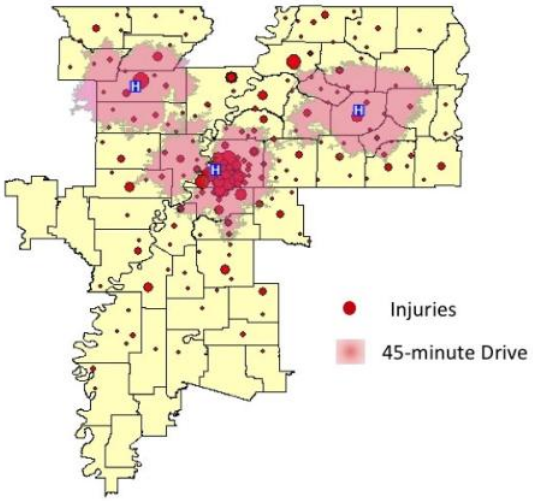
Results: A total of 1,767 severely injured patients were identified across 54 counties in the tri-state region. 48% of the population and 58% of the injuries were within a 45-minute driving distance of the legacy trauma center (Figure 1). With the addition of another urban center, injured and total population coverage increased by only 1% while decreasing the volume to the existing center by 40%. However, the addition of two rural trauma centers increased coverage significantly to 62% of the population and 71% of the injured ($p < 0.001$, Figure 2). The volume of the legacy center was decreased by 25% but unfortunately the self-pay rate increased by 16%.

Conclusions: The geospatial modeling of NBATS-2 can identify improved population and injury coverage within a region. Furthermore, it can predict both volume and financial implications to a current trauma system. NBATS-2 seems to be an appropriate mechanism for large scale trauma system planning.



Current System with 1 Trauma Center

Injuries and population within 45-minute drive time of the current legacy trauma center.



Addition of 2 Rural Trauma Centers

Injuries and population within 45-minute drive time with the addition of 2 rural trauma centers.

Paper #35
January 18, 2019
11:40 am

DEFINING GEOGRAPHIC EMS COVERAGE IN TRAUMA SYSTEMS

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University of Pittsburgh Medical Center

Presenter: Joshua B. Brown, MD, MSc

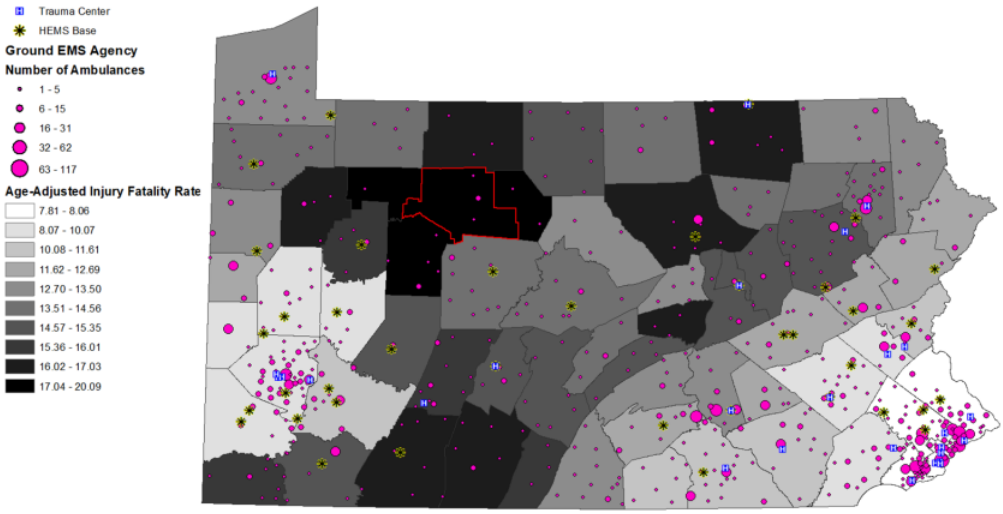
Discussant: Farheen A. Qurashi, MD, Sinai Hospital of Baltimore (Lifebridge Health)

Objectives: Geographic distribution of trauma system resources correlates with outcomes. However, ground EMS coverage is dynamic and more difficult to quantify. Our objective was to evaluate measures that could be used to describe ground EMS coverage in trauma systems that correlate with outcomes.

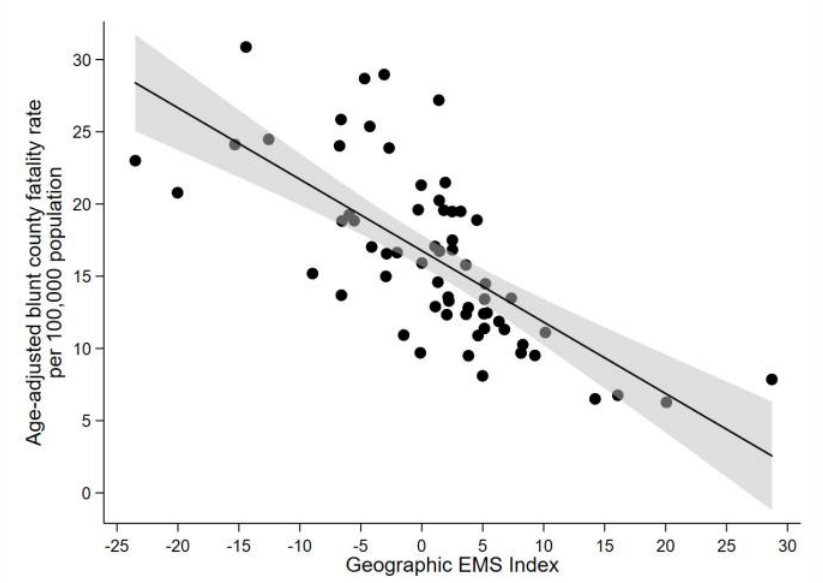
Methods: Trauma system resources in Pennsylvania were mapped. Primary outcome was county age-adjusted blunt injury fatality rate. Measures of county EMS coverage included average distance to the nearest trauma center, number of BLS and ALS units/100 square miles, distance differential between the nearest trauma center and nearest helicopter base, and nearest neighbor ratio (dispersed/clustered geographic pattern of agencies). Spatial-lag regression determined association between fatality rates and these measures, adjusted for demographics, education, income, and ISS. Relative importance of these measures was determined by assessing the loss in R2 value from the full model by removing a measure. A Geographic EMS Index (GEMSI) was created based on these for each county.

Results: Median fatality rate was higher in counties with fewer trauma system resources (FIG 1). Decreasing distance to nearest trauma center, increasing ALS units/100 square miles, greater distance reduction from helicopter bases, and dispersed geographic pattern of county EMS agencies were associated with lower fatality rates. The GEMSI ranged from -23.5 to 28.7 and accounted for 53% of variation in fatality rates (FIG 2). Adding an EMS agency that gave Elk county (red outline) a dispersed pattern of EMS coverage reduced predicted fatality rate by 5%, while moving a helicopter base into Elk county reduced predicted fatality rate by 13%.

Conclusions: GEMSI uses several measures of ground EMS coverage and correlates with outcome. This may be used to describe and compare ground EMS coverage across trauma system geographies, as well as help optimize the geographic distribution of trauma system resources.



Trauma system resources in Pennsylvania. Gray scale color ramp represents age-adjusted blunt injury fatality rates per 100,000 population. Trauma centers represented by blue hospital symbol; helicopter bases represented by black & gold star. Ground EMS agencies represented by pink dot, size corresponds to number of ambulances. Red outline represents Elk County.



Plot of age-adjusted county-level age-adjusted injury fatality rates for blunt injury per 100,000 population by geographic EMS index (GEMSI). Higher GEMSI values represent more favorable configuration of ground EMS coverage. Line represents fitted linear regression values with 95%CI band around it.

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