33RD ANNUAL SCIENTIFIC ASSEMBLY

January 14-18, 2020

LOEWS SAPPHIRE FALLS RESORT
ORLANDO, FLORIDA

east

Eastern Association for the Surgery of Trauma

Advancing Science, Fostering Relationships, and Building Careers

https://www.east.org/education/annual-scientific-assembly/cme-information

Meeting Evaluation & Earning your CME
Obtaining CME as well as retrieving your certificate must be completed online. To receive CME and your certificate, **you must complete** the online evaluation(s) using the online system by the specified deadline (see below). Please contact the EAST offices at ceme@east.org or by phone at 312-202-5508 if you have questions or are unable to access the online system.

Using the Online System - It's as Easy as 1-2-3
1. Login into the **EAST Annual Scientific Assembly Online Evaluation System - You must have completed the online evaluation by February 17, 2020 to be eligible to receive CME Credit.**

- **Username**: Your **Username** is the **Email Address** you provided with your meeting registration
- **Password**: After entering in your email address, enter in the password: **EAST**

2. Claim credit per day

3. Retrieving your certificate - very important

- After you have completed the necessary evaluations and the Overall Evaluation, the Certificate button will be enabled.
- Click on the Certificate button.
- Click on Create Certificate - the system will create the appropriate certificate(s) and give you the option to download it to your computer or email it to yourself*.

You must take a certificate for your credits to be posted

**You will need Adobe Reader in order to view your certificate. If you do not have access to a printer at the time you are completing the evaluation, you can email it to yourself or download it at any time by logging back in and clicking Certificate.*

Important Deadlines for Claiming Credit
EAST partners with the American College of Surgeons (ACS) to offer AMA PRA Category 1 Credit™ for the Annual Scientific Assembly and Workshops. Physicians should claim only the credit commensurate with the extent of their participation in the activity. The ACS requires that you complete all meeting by the date listed below to receive credit.

***February 17, 2020** - Online evaluation must be completed to claim credit and receive your certificate. The ACS requires all CME forms and evaluations be completed within 30 calendars days of the conclusion of the meeting.*

https://www.east.org/education/annual-scientific-assembly/cme-information

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.
8. Describe optimal indications for laparoscopic and robotic surgical interventions in trauma and emergency general surgery care.

CONTINUING MEDICAL EDUCATION CREDIT INFORMATION
EAST Annual Scientific Assembly – January 15-17, 2020

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 21.25 *AMA PRA Category 1 Credits™.* Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 1.00 hour meet the requirements for Risk Management.*
Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of .50 hours meet the requirements for Opioid/Pain Management.*
Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 5.25 hours meet the requirements for Patient Safety.*
Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 1.25 hours meet the requirements for Pediatric Trauma.*
Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 4.50 hours meet the requirements for Surgical Critical Care.*
Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 10.75 hours meet the requirements for Trauma.*
Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 1.00 hour meet the requirements for Domestic Violence.*
Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 1.00 hour meet the requirements for Medical Errors and Prevention.*

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

AMERICAN COLLEGE OF SURGEONS
DIVISION OF EDUCATION

CONTINUING MEDICAL EDUCATION CREDIT INFORMATION
EAST Leadership Development Workshop – January 14, 2020

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 7.0 *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 1.00 credits meet the requirements for Cultural Competency.

**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.*

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

ACCME
ACCREDITED WITH COMMENDATION

AMERICAN COLLEGE OF SURGEONS
DIVISION OF EDUCATION

CONTINUING MEDICAL EDUCATION CREDIT INFORMATION
MIS MASTERS Course – January 14, 2020

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 7.50 *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 2.00 credits meet the requirements for Trauma.

Of the *AMA PRA Category 1 Credits*™ listed above, a maximum of 2.00 credits 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.*

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

ACCME
ACCREDITED WITH COMMENDATION

AMERICAN COLLEGE OF SURGEONS
DIVISION OF EDUCATION

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 financial relationships with any commercial interest. For additional information, please visit the ACCME website (see below for definitions).

Commercial Interest: The ACCME defines a "commercial interest" as any entity producing, marketing, re-selling, or distributing health care goods or services used on or consumed by patients. Providers of clinical services directly to patients are NOT included in this definition.
Financial Relationships: Relationships in which the individual benefits by receiving a salary, royalty, intellectual property rights, consulting fee, honoraria, ownership interest (e.g., stocks, stock options or other ownership interest, excluding diversified mutual funds), or other financial benefit. Financial benefits are usually associated with roles such as employment, management position, independent contractor (including contracted research), consulting, speaking and teaching, membership on advisory committees or review panels, board membership, and other activities from which remuneration is received, or expected. ACCME considers relationships of the person involved in the CME activity to include financial relationships of a spouse or partner.
Conflict of Interest: Circumstances create a conflict of interest when an individual has an opportunity to affect CME content about products or services of a commercial interest with which he/she has a financial relationship.

The ACCME also requires that ACS manage any reported conflict and eliminate the potential for bias during the educational activity. 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 the educational activity, please report it on the evaluation.

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure Company	Role	Received
Hiba Abdel Aziz	X			
Pablo Achurra	X			
Brittany Aicher	X			
Tanya Anand	X			
Taylor Anderson	X			
Lisa Angotti	X			
Scott Armen	X			
Scott Assen	X			
Barbara Barlow	X			
Alec Beekley	X			
Christopher Behr	X			
Andrew Bernard		Atox Bio	Consulting	Research Funding
Matthew Bernard	X			
Letitia Bible	X			
Walter Biffl	X			
Stephanie Bonne	X			
Eric Bradburn	X			
Alexandra Briggs	X			
Brandon Bruns	X			
Mary Bryant	X			
Nikolay Bugaev	X			
Marko Bukur	X			
Eileen Bulger	X			
Clay Burlew	X			
Saskya Byerly	X			
Rachael Callcut		GE Healthcare Servier Inc Haemonetics Philips Healthcare	PI PI PI Intellectual Property	Research Grant to UCSF Research Grant to UCSF Research Grant to UCSF Royalties
Eric Campion	X			
Heather Carmichael	X			
Julius Cheng	X			
Amanda Chipman	X			
William Chiu	X			
Ashley Christmas	X			
Christine Claborn	X			
Jamie Coleman	X			
Julia Coleman	X			
Kennith Coleman	X			
John Como	X			
Robert Conrad	X			
Marie Crandall	X			

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure Company	Role	Received
Michael Cripps		Instrumentation Laboratory Worldwide Hemosonics	Consultant Consultant	Honorarium Honorarium
Martin Croce	X			
Kyle Cunningham	X			
Vijaya Daniel	X			
Kimberly Davis	X			
Andrew-Paul Deeb	X			
Danielle DeFoe	X			
Jose Diaz		Acute Innovations	Consultant Lecturer	Honorarium
Sandra DiBrito	X			
Sharmila Dissanaike	X			
Woo Do	X			
Jon Dorfman	X			
John Draus	X			
Linda Dultz	X			
Thomas Duncan	X			
Courtney Edwards	X			
Terri Elsbernd	X			
Jordan Estroff	X			
Steve Eubanks	X			
Charity Evans	X			
Benjamin Fairchild	X			
Ashley Farhat-Sabet	X			
Joseph Fernandez-Moure	X			
Kyle Fischer	X			
Dominic Forte	X			
Nicole Fox Fox	X			
Julie Freischlag	X			
Apostolos Gaitanidis	X			
Jared Gallaher	X			
Brian Gavitt	X			
Tim Geiger	X			
Rondi Gelbard	X			
Mira Ghneim	X			
Nina Glass	X			
Ross Goldberg	X			
Michael Goodman	X			
Nicole Goulet	X			
April Grant	X			
Areg Grigorian	X			

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure Company	Role	Received
Ronald Gross	X			
Oscar Guillamondegui	X			
Shailvi Gupta	X			
Matthew Guttman	X			
Krista Haines	X			
Kamil Hanna	X			
Laura Harmon	X			
Jennifer Hartwell	X			
John Harvin	X			
Justin Hatchimonji	X			
Gabrielle Hatton	X			
Elliott Haut	X			
Vera Hendrix	X			
Sara Hennessy	X			
Jason Higginson	X			
Vanessa Ho		Atricure Zimmer Biomet Sig Medical Medtronic	Spouse Consultant for all	Spouse receives consultant fee for all
Mark Hoofnagle	X			
Dara Horn	X			
John Hwabejire	X			
Neil Hyman	X			
Shawn Izadi	X			
Jill Jakubus	X			
Amelia Johnson	X			
Eric Johnson	X			
Bellal Joseph	X			
D'Andrea Joseph	X			
Hee Soo Jung	X			
Haytham Kaafarani	X			
George Kasotakis	X			
Elinore Kaufman	X			
Johnathan Kent	X			
Cathleen Khandelwal	X			
Ahmed Khouqeer	X			
Julie Kim	X			
Chase Knickerbocker	X			
Jennifer Knight Davis	X			
Lisa Kodadek	X			
Lucy Kornblith		TEG6s Comparison Study in Trauma for FDA Approval	Investigator	No financial compensation

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure Company	Role	Received
Laura Kreiner	X			
Nicole Krumrei	X			
Daniel Lammers	X			
Stefan Leichtle	X			
Amy Liepert	X			
Robert Lim		UpToDate, Inc.	Consultant	Honorarium
Matthew Lissauer		LaJolla Pharmaceuticals	Speakers Bureau (ended 1/2019	Honorarium
John Lunde	X			
Karen Maccauley	X			
Najjia Mahmoud	X			
Eric Mahoney	X			
Adil Malek	X			
Mike Mallah	X			
Matthew Martin	X			
Niels Martin	X			
Sarah Mattocks	X			
Adrian Maung	X			
Patrick McCarthy	X			
Jonathan Messing	X			
Dave Morris	X			
Ronnie Mubang	X			
Kaushik Mukherjee	X			
Jeffry Nahmias	X			
Charlie Nederpelt	X			
Chance Nichols	X			
Vanessa Nomellini	X			
Kathleen O'Connell	X			
Kathleen O'Neill	X			
Andrea Pakula		Intuitive Surgical, Inc. BARD	Speaker Speaker	Honorarium Honorarium
Jose Pascual	X			
Mayur Patel	X			
Nimitt Patel	X			
Allan Peetz	X			
Christopher Pennell	X			
John Petty	X			
Blake Platt	X			
Rebecca Plevin	X			
Stephanie Polites	X			
Travis Polk	X			
Odessa Alelee Pulido	X			
Kasiemobi Pulliam	X			

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure Company	Role	Received
Laurie Punch	X			
Zaffer Qasim	X			
Jin Ra	X			
Lauren Raff	X			
Sean Randazzo	X			
Asanthi Ratnasekera	X			
Rishi Rattan	X			
Srinivas Reddy	X			
Kevin Ricci	X			
Christina Riojas	X			
Lisbi Rivas	X			
Bryce Robinson	X			
Rachel Rodriguez	X			
Sharona Ross	X			
Amy Rushing	X			
Edgardo Salcedo	X			
Babak Sarani	X			
Jason Saucier	X			
Stephanie Savage	X			
Jaswin Sawhney	X			
Kevin Schuster	X			
Mark Seamon		AURORA The Trauma Manual (Wolters Kluwer) Management of Chest Trauma (Springer Nature)	PI Editor Editor	1% salary support + $500 per pt enrolled 1.5% book sale royalties Fee + 10% book royalties
David Shatz	X			
Edward Sim	X			
Jon Simmons	X			
Carrie Sims	X			
David Skarupa	X			
Ruby Skinner		BARD	Data Safety Committee Member	Honorarium
Weston Smedley	X			
Randi Smith	X			
Katherine Snyder	X			
David Spain	X			
Nichole Starr	X			
Nicole Stassen	X			
Deborah Stein	X			
Christian Streck	X			

Speakers / Moderators / Discussants	Nothing to Disclose	Disclosure Company	Role	Received
Stephanie Streit	X			
John Stupinski	X			
Jessica Summers	X			
Leah Tatebe	X			
John Taylor	X			
Larissa Temple	X			
Callie Thompson	X			
Glen Tinkoff	X			
Kathleen To	X			
Colleen Trevino	X			
Michael Truitt	X			
Esther Tseng	X			
Lily Tung	X			
Charles Vasquez	X			
Adam Vogel	X			
Zachary Warriner	X			
Scott Welle	X			
Mia West	X			
Andrew Wheeler	X			
Jacob Whipp	X			
Brian Williams	X			
Regan Williams	X			
Alison Wilson	X			
Evan Wong	X			
Salina Wydo	X			
Daniel Yeh		Takeda UpToDate ASPEN/GE Health Care SCCM-2019 Annual Meeting	Investigator Chptr Author Teacher Presenter	Research Grant Royalties Honorarium Honorarium
Tanya Zakrison	X			
Ben Zarzaur	X			
Roger Zhu	X			
Martin Zielinski	X			

Planning Committee	Nothing to Disclose	Disclosure		
		Company	Role	Received
Suresh Agarwal		Acute Innovations	Intellectual Pro	Grant Support
Rachael Callcut		GE Healthcare Servier Inc Haemonetics Philips Healthcare	PI PI PI Intellectual Property	Research Grant to UCSF Research Grant to UCSF Research Grant to UCSF Royalties
Vanessa Ho		Atricure Zimmer Biomet Sig Medical Medtronic	Spouse Consultant for all	Spouse receives consultant fee for all
Shannon Foster	X			
Bellal Joseph	X			
Haytham Kaafarani	X			
Matthew Lissauer		LaJolla Pharmaceuticals	Speakers Bureau (ended 1/2019	Honorarium
Gary Marshall	X			
Matthew Martin	X			
Niels Martin		Portola	Consultant	Honorarium
Alicia Mohr	X			
Mark Seamon		AURORA The Trauma Manual (Wolters Kluwer) Management of Chest Trauma (Springer Nature)	PI Editor Editor	1% salary support + $500 per pt enrolled 1.5% book sale royalties Fee + 10% book royalties
Amy Rushing	X			
Cynthia Talley	X			
Ronald Tesoriero	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

Society of Trauma Nurses is accredited as a provider of nursing continuing professional development 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 – Making the GRADE: The Art & Science of Creating High Quality PMGs*	Wednesday, January 15, 2020 7:30 am-11:15 am	3.75 Hours
Short Course – Surgical Research Boot Camp: From Idea to Publication*	Wednesday, January 15, 2020 7:30 am-11:15 am	3.75 Hours
Short Course – Prevention is the Best Medicine: Building & Maintaining a High Quality Injury Prevention Program*	Wednesday, January 15, 2020 7:30 am-11:15 am	3.75 Hours
Short Course – Trauma Quality Short Course*	Wednesday, January 15, 2020 7:30 am-11:15 am	3.75 Hours
Scientific Session I	Wednesday, January 15, 2020 12:30 pm-2:10 pm	1.75 Hours
Scientific Session II	Wednesday, January 15, 2020 2:30 pm-4:10 pm	1.75 Hours
Quick Shot Session I*	Thursday, January 16, 2020 9:00 am-10:00 am	1.0 Hour
Quick Shot Session II*	Thursday, January 16, 2020 9:00 am-10:00 am	1.0 Hour
Parallel Plenary Session*	Thursday, January 16, 2020 10:15 am-11:15 am	1.0 Hour
Parallel Plenary Session*	Thursday, January 16, 2020 10:15 am-11:15 am	1.0 Hour
Quick Shot Session III*	Thursday, January 16, 2020 11:15 am-12:15 pm	1.0 Hour
Quick Shots IV*	Thursday, January 16, 2020 11:15 am-12:15 pm	1.0 Hour
Scientific Session III-A*	Thursday, January 16, 2020 1:45 pm-3:45 pm	2.0 Hours
Scientific Session III-B*	Thursday, January 16, 2020 1:45 pm-3:45 pm	2.0 Hours
Parallel Plenary Session*	Thursday, January 16, 2020 4:00 pm-5:20 pm	1.25 Hours
Parallel Plenary Session*	Thursday, January 16, 2020 4:00 pm-5:20 pm	1.25 Hours
Scientific Session IV-A*	Friday, January 17, 2020 7:45 am-9:45 am	2.0 Hours
Scientific Session IV-B*	Friday, January 17, 2020 7:45 am-9:45 am	2.0 Hours
Parallel Plenary Session*	Friday, January 17, 2020 10:00 am-11:00 am	1.0 Hour
Parallel Plenary Session*	Friday, January 17, 2020 10:00 am-11:00 am	1.0 Hour
Scott B. Frame, MD Memorial Lecture	Friday, January 17, 2020 11:15 am-12:00 pm	.75 Hours
Parallel Plenary Session*	Friday, January 17, 2020 1:00 pm-2:15 pm	1.25 Hours
Parallel Plenary Session*	Friday, January 17, 2020 1:00 pm-2:15 pm	1.25 Hours
Plenary – Practice Management Guidelines	Friday, January 17, 2020 2:30 pm-4:430 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, our Executive Director Christine Eme and Administrative Staff, welcome to Orlando for the 33rd Annual Scientific Assembly of the Eastern Association for the Surgery of Trauma (EAST). While we have been to sunny Florida many times before, this year brings a new feel at a new property- Universal Studios. Harry Potter awaits.

The Annual Scientific Assembly serves as EAST's premier in-person educational extravaganza. Dr. Matthew Martin and the Annual Scientific Assembly Committee have outdone themselves with a jam packed meeting with offerings of all types - lectures, panels, video sessions, and hands on training sessions. There is something for everyone. In addition to the scientific program, we have a wonderful series of social events, from the Opening Reception to the Closing Party for more informal networking with colleagues and friends.

We will be #AdvancingScience with the presentation of innovative research. I expect you to be #FosteringRelationships in the hallways, meeting rooms, dining establishments, and maybe even the theme park. I am counting on the EAST Senior members to take their mentoring roles seriously and help the junior attendees in #BuildingCareers with programming and formal networking opportunities such as the "No Suit, No Problem: Fostering Relationships & Building Careers" event.

Even before the meeting officially starts, there are options from which to choose on Tuesday. Join us at the William R. Boone High School for our injury prevention outreach day. Alternatively, you may be interested in one of the pre-meeting career development workshops aimed at early career faculty, residents, and fellows. On the other hand, you might take the MIS MASTERS (Multi-society Advanced Skills Training in EmeRgency Surgery) course offered in collaboration with our sister societies - SAGES, ASCRS, and AAST.

We have an outstanding series of short courses Wednesday morning to learn in a more intimate, small room feel to delve deep into important topics such as research, guideline development, injury prevention, and quality improvement. Then, we kick off the main event with 10 research presentations in the Raymond H. Alexander, MD Resident Paper Competition, emphasizing our mission to mentor residents to be surgical scientists in trauma and acute care surgery.

I am truly honored to have one of my favorite surgical mentors, Julie A. Freischlag, MD, FACS, delivering the Scott B. Frame, MD Memorial Lecture titled "Ensuring Patient Trust." While Dr. Freischlag may be an unconventional choice to speak in a trauma conference, I guarantee her lecture will be inspiring and thought provoking. The Oriens Award Keynote lecture, "Harnessing Your Passion and Connecting to Purpose," will be delivered by Eileen M. Bulger, MD, FACS, the Chair of the ACS-COT.

Good luck choosing between the intriguing, overlapping plenary sessions covering hot topics such as landmark papers, injury prevention, advocacy, humanitarian surgery, quality improvement, equity, and clinical care. Closing out Friday afternoon will be the Practice Management Guidelines (PMGs) session, another annual tradition, most near and dear to my heart.

I would be remiss if I did not push our attendees to help promote @EAST_Trauma on social media by "livetweeting" our meeting. Twitter is an excellent platform to engage in collegial discussion amongst our meeting attendees and those following along virtually at home. Don't forget to use the hashtag #EAST2020 when sharing slides, videos, photos, and selfies to demonstrate our science, collegiality, leadership, and mentorship.

As I finish my year as EAST President, I want you all to know how much of an honor it has been to serve. I have been thrilled to represent this amazing organization, speaking across the country and collaborating with over 50 other medical societies on important topics of research, advocacy, education, mentoring, guideline development, and clinical care. I would also like to publicly thank the EAST Board of Directors and every committee and ad hoc task force member. Your volunteer time and energy is the heart and soul of EAST and drives the organization to new heights.

EAST is my favorite surgical organization as it aligns so well with my personal mission of mentoring the next generation of trauma surgeons to be scientists, clinicians, advocates, and leaders. Every day, I am proud of these vibrant, early career surgeons who devote their lives to the care of the critically ill and injured. The future is bright.

Elliott R. Haut, MD, PhD, 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

2019 Board of Directors

Elliott R. Haut, MD, PhD, FACS, President
A. Britton Christmas, MD, FACS, President-Elect
Andrew C. Bernard, MD, FACS, Past President
Jason W. Smith, MD, PhD, FACS, Treasurer
Deborah M. Stein, MD, MPH, FACS, Secretary
Thomas K. Duncan, DO, FACS, Director
Paula Ferrada, MD, FACS, Director
Matthew J. Martin, MD, FACS, Director
Mayur B. Patel, MD, MPH, FACS, Director
Mark J. Seamon, MD, FACS, Director
Alison M Wilson, MD, FACS, Director
Ben L. Zarzaur, MD, MPH, FACS, Director

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

Oscar D. Guillamondegui, MD, MPH, FACS

2019 Divisions, Committee & Ad Hoc Task Forces

Development Committee
Babak Sarani, MD, FACS, Committee Chair
Alexander L. Eastman, MD, MPH, FACS, Committee 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
Paula Ferrada, MD, FACS, Division Chair
Member Recruitment and Retention Committee – Paula Ferrada, MD, FACS, Committee Chair

Division of Patient Care and Resources
Mayur B. Patel, MD, MPH, FACS, Division Chair
Burn Surgery Committee – Joshua Carson, MD, FACS, Committee Chair &
Callie Thompson, MD, FACS, Committee Vice Chair
Emergency General Surgery Committee – D. Dante Yeh, MD, MHPE, FACS, Committee Chair
Guidelines Committee – John J. Como, MD, MPH, FACS, Committee Chair &
Nicole Fox, MD, MPH, Committee Vice 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
Minimally Invasive Surgery & Emerging Technologies Ad Hoc Task Force –
Andrea Pakula, MD, MPH, FACS, Ad Hoc Task Force Chair

Division of Professional Development
Alison M. Wilson, MD, FACS, Division Chair
Career Development Committee – Brad Dennis, MD, FACS, Committee Chair
Mentoring Committee – Jamie J. Coleman, MD, FACS, Committee Chair
Military Committee – Travis M. Polk, MD, FACS & Stephanie Streit, MD, FACS, Committee Chairs
Seniors Committee – Oscar Guillamondegui, MD, MPH, 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
Ben L. Zarzaur, MD, MPH, FACS, Division Chair
Multicenter Trials Committee – Jeffry Nahmias, MD, MHPE, FACS, Committee Chair
Research-Scholarship Committee – Rachael A. Callcut, MD, MSPH, 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 & Ad Hoc Task Forces.

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*
2018	Andrew C. Bernard	*EAST: A Legacy of Inclusion*

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
Christopher Born	Director at Large
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

1995

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

1996

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
Grace Rozycki	Director at Large

1998

Timothy C. Fabian	President
David Reath	President Elect
John A. Morris, Jr.	Past President
Blaine Enderson	Secretary/Treasurer
Paul Cunningham	Recorder/Program Chair
Nabil Atweh	Director at Large
Philip S. Barie	Director at Large
C. Gene Cayten	Director at Large
Martin Croce	Director at Large
Eric Frykberg	Director at Large
Orlando Kirton	Director at Large
Mary McCarthy	Director at Large
Michael McGonigal	Director at Large
J. Wayne Meredith	Director at Large
Michael Pasquale	Director at Large
Andrew Peitzman	Director at Large
Michael F. Rotondo	Director at Large

1999

David Reath	President
Paul Cunningham	President Elect
Timothy C. Fabian	Past President
Blaine Enderson	Secretary/Treasurer
Michael F. Rotondo	Recorder/Program Chair
Nabil Atweh	Director at Large
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

2000

Paul Cunningham	President
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
Michael F. Rotondo	Recorder/Program Chair
Jack Bergstein	Director at Large
Ernest FJ Block	Director at Large
Collin Brathwaite	Director at Large
Samir Fakhry	Director at Large
Heidi Frankel	Director at Large
Fred Luchette	Director at Large
Kimberly Nagy	Director at Large
Lena Napolitano	Director at Large
Patrick Reilly	Director at Large
L. R. “Tres” Scherer, III	Director at Large
Gregory Timberlake	Director at Large

2002

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

2003

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

2004

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

2005

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

2006

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

2007

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

2008

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

2009

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

2010

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

2011

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

2012

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

2013

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

2014

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

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

2018

Andrew Bernard	President
Elliott Haut	President-Elect
Bruce Crookes	Past President
A. Britton Christmas	Treasurer
Deborah Stein	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
Alison Wilson	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
January 15-19, 2019	*JW Marriott Austin*	Austin, TX

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

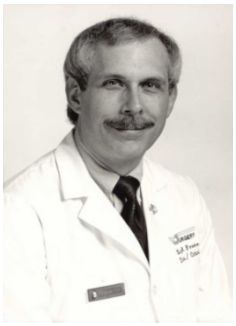
I was asked by President Rotondo to make a brief presentation of a significance which will become apparent shortly. Yesterday, I was surprised to discover that 5% of Active EAST members have been deployed to war in Iraq/Afghanistan in the past year alone. But, let me share with you a story of a 22 y.o. 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.

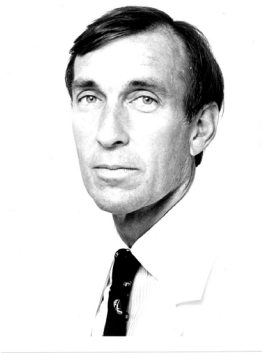
Dr. Frame was very active in the early days of EAST. He was a charter member of the organization who served in many ways. He was on the membership committee and the program committee, playing an active role in these committees as they helped establish the reputation of EAST and powered its early growth. 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
2020 Julie A. Freischlag, 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.*

Josephine "Pina" Templeton, MD
1940-2019

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.

EAST Cox-Templeton Injury Prevention Paper Competition

The Cox-Templeton Paper Competition is a competition of abstracts focused on an aspect of injury prevention that are presented during the EAST Annual Scientific Assembly The Competition is supported by a grant from Drs. Jack and Pina Templeton. In 2012 this award was renamed the Cox-Templeton Injury Prevention Paper Competition to recognize the contributions of John Templeton, Jr., MD and Ms. Julia Cox-McCarter in the area of Injury Prevention.

Julia H. Cox McCarter was devoted to trauma prevention and organ donation. Ms. Cox McCarter was the long-time head of the American Trauma Society Pennsylvania Division (ATSPA). Ms. Cox McCarter and Dr. John M. Templeton, Jr., MD worked together on the ATSPA; Ms. Cox McCarter as the Executive Director and Dr. Templeton as the Board President. Ms. Cox McCarter built ATSPA into one of the most active and influential ATS Divisions. Ms. Cox McCarter was a leader in organ donation program development and coordinated the Pennsylvania Department of Health's first organ donation program. She also wrote Pennsylvania's first protocol for helicopter evacuation. Per printed obituaries and quotes from loved ones, Ms. Cox McCarter "was fascinated by emergency room care and was greatly affected by people and their loved ones, who sustained terrible injuries that might have been prevented." Ms. Cox McCarter was a Nurse Anesthetist and held a Master's Degree in Public Health. She served in the U.S. Army Reserve and earned the rank of Major while serving with the Nurse Corps.

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 was 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 has 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.*

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.

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
2019 Colonel (ret) Matthew J. Martin, MD, FACS

Eastern Association for the Surgery of Trauma
33rd EAST Annual Scientific Assembly
January 14-18, 2020
OVERALL SCHEDULE

MONDAY, JANUARY 13, 2020

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

8:00 am-4:00 pm	**American Burn Association** **Advanced Burn Life Support Provider Course (ABLS)** *Presented by the EAST Burn Surgery Committee*	Turks 1-6

TUESDAY, JANUARY 14, 2020

7:00 am-4:00 pm	EAST Community Outreach 2020 Orlando, Florida	William R. Boone High School
7:30 am-6:00 pm	Registration	Grand Caribbean Pre-Function North
7:30 am-6:00 pm	Speaker Preparation Room	St. Croix 3
7:30 am-4:00 pm	EAST Development Fund & Information Kiosks	Grand Caribbean Pre-Function North

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

8:00 am-4:00 pm	**Taking the Lead: Strategies for Leading within Your Group - An EAST Leadership Development Workshop** *Presented by the EAST Career Development Committee*	Grand Caribbean Ballrooms 1-2
8:00 am-5:00 pm	**MIS MASTERS Course** (**M**ulti-society **A**dvanced **S**kills **T**raining in **E**me**R**gency **S**urgery) *A collaboration between SAGES, ASCRS, AAST & EAST*	Grand Caribbean Ballrooms 3-5
1:30 pm-5:15 pm	**Bridging the Gap: A Chief Residents and Fellows Workshop** *Presented by the EAST Career Development Committee*	Grand Caribbean Ballrooms 8-9

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	Grand Caribbean Ballrooms 10-11
6:00 pm-9:00 pm	Exhibit Set-up	Grand Caribbean Ballroom 6

Industry Events:

6:00 pm-9:00 pm	Portola Pharmaceuticals, Inc. Industry Education Symposium	Grand Caribbean Ballroom 12

A Mother's Room is available in the Meeting Planner Office 3

Eastern Association for the Surgery of Trauma
33rd EAST Annual Scientific Assembly
January 14-18, 2020
OVERALL SCHEDULE

WEDNESDAY, JANUARY 15, 2020

6:30 am-5:45 pm	Registration	Grand Caribbean Pre-Function North
6:30 am-5:45 pm	Speaker Preparation Room	St. Croix 3
7:00 am-4:45 pm	EAST Development Fund & Information Kiosks	Grand Caribbean Pre-Function North
7:00 am-10:45 am	Exhibit Set-up	Grand Caribbean Ballroom 6

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

7:30 am-11:15 am	**EAST Short Course #1** **Making the GRADE: The Art and Science of Creating High Quality Practice Management Guidelines** *Presented by the EAST Guidelines Committee*	Grand Caribbean Ballrooms 1-2
7:30 am-11:15 am	**EAST Short Course #2** **Surgical Research Boot Camp: From Idea to Publication, Funding, and Beyond** *Presented by the EAST Research-Scholarship Committee & the EAST Multicenter Trials Committee*	Grand Caribbean Ballroom 3-5
7:30 am-11:15 am	**EAST Short Course #3** **Prevention is the Best Medicine: Building and Maintaining a High Quality Injury Prevention Program in Any Setting** *Presented by the EAST Injury Control and Violence Prevention Committee*	Grand Caribbean Ballrooms 8-10
7:30 am-11:15 am	**EAST Short Course #4** **Trauma Quality Short Course: A Hands-On Approach to Trauma PI/QA and Multidisciplinary Trauma Peer Review** *Presented by the EAST Quality, Safety & Outcomes Committee*	Grand Caribbean Ballrooms 11-12

12:00 pm-4:30 pm	Exhibits	Grand Caribbean Ballroom 6
12:00 pm-12:30 pm	**Opening Ceremony - Flag Ceremony & Opening Remarks**	Grand Caribbean Ballroom 7
12:30 pm-2:10 pm	**Scientific Session I: Raymond H. Alexander, MD Resident Paper Competition** *(Papers 1-5)* Moderators: Elliott R. Haut, MD, PhD & Vijaya T. Daniel, MD, MPH *(2019 Clinical Science Paper Recipient)*	Grand Caribbean Ballroom 7
2:10 pm-2:30 pm	Afternoon Break - Refreshments provided in the Exhibit Hall	Grand Caribbean Ballroom 6
2:30 pm-4:10 pm	**Scientific Session II: Raymond H. Alexander, MD Resident Paper Competition** *(Papers 6-10)* Moderators: A. Britton Christmas, MD, FACS & Woo S. Do, MD *(2019 Basic Science Paper Recipient)*	Grand Caribbean Ballroom 7
4:15 pm-5:15 pm	**Opening Keynote - Presidential Address** **EAST Practice Management Guidelines and the Perpetual Quest for Excellence** **Elliott R. Haut, MD, PhD, FACS**	Grand Caribbean Ballroom 7
5:20 pm-6:20 pm	**EAST Annual Business Meeting** **Open to All EAST Members**	Grand Caribbean Ballroom 7

EAST Receptions & Special Events:

6:30 pm-7:30 pm	EAST Development Donor & Exhibitor Appreciation Reception *(By invitation only)*	Grand Caribbean Ballrooms 1-2
6:30 pm-8:30 pm	Opening Reception *(RSVP requested)*	Cayman Court Lawn
8:00 pm-10:00 pm	EAST President's Private Reception *(By invitation only)*	Amatista Restaurant

A Mother's Room is available in the Meeting Planner Office 3

Eastern Association for the Surgery of Trauma
33rd EAST Annual Scientific Assembly
January 14-18, 2020
OVERALL SCHEDULE

THURSDAY, JANUARY 16, 2020

6:30 am-5:00 pm	Registration	Grand Caribbean Pre-Function North
6:30 am-5:00 pm	Speaker Preparation Room	St. Croix 3
7:00 am-5:00 pm	EAST Development Fund & Information Kiosks	Grand Caribbean Pre-Function North
7:00 am-8:00 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* *(RSVP requested)*	Kingston Hall
7:45 am-4:00 pm	Exhibits	Grand Caribbean Ballroom 6
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* 8:15 am-8:50 am Keynote Address – *Harnessing Your Passion and Connecting to Purpose* Speaker: Eileen M. Bulger, MD, FACS 8:50 am-9:00 am - 2020 EAST Oriens Essay Presentations Resident Winner – Mike Mallah, MD Fellow Winner – Christina Riojas, MD	Grand Caribbean Ballroom 7
8:00 am-9:15 am	Continental Breakfast provided in the Exhibit Hall	Grand Caribbean Ballroom 6
9:00 am-10:00 am	**Quick Shots Parallel Session I** *(Quick Shots 1-10 Presented)* Moderators: Mayur Patel, MD, MPH & Callie Thompson, MD	Grand Caribbean Ballroom 7
9:00 am-10:00 am	**Quick Shots Parallel Session II** *(Quick Shots 11-20 Presented)* Moderators: David Morris, MD & Ruby Skinner, MD	Kingston Hall
10:00 am-10:15 am	Morning Break - Refreshments provided in the Exhibit Hall	Grand Caribbean Ballroom 6
10:15 am-11:15 am	**Parallel Plenary Session** 2019 Landmark Papers in Acute Care Surgery *Presented by the EAST Manuscript and Literature Review Committee* Moderator: Martin Zielinski, MD	Grand Caribbean Ballroom 7
10:15 am-11:15 am	**Parallel Plenary Session** Injury Prevention Advocacy: How to Find Your Voice *Presented by the EAST Injury Control and Violence Prevention Committee* Moderator: Rachel Rodriguez, MD	Kingston Hall
11:15 am-12:15 pm	**Quick Shots Parallel Session III** *(Quick Shots 21-30 Presented)* Moderators: Kyle Cunningham, MD, MPH & Brian Williams, MD	Grand Caribbean Ballroom 7
11:15 am-12:15 pm	**Quick Shots Parallel Session IV** *(Quick Shots 31-40 Presented)* Moderators: Brian Gavitt, MD, MPH & Christina Riojas, MD	Kingston Hall
12:15 pm-1:45 pm	Past Presidents Luncheon *(By invitation only)*	Amatista Restaurant

A Mother's Room is available in the Meeting Planner Office 3

THURSDAY, JANUARY 16, 2020 (CONTINUED)

12:15 pm-1:30 pm	Grab & Gab Lunch – Grab some lunch provided by EAST & take a moment to talk to the EAST 2020 Exhibitors!	Grand Caribbean Ballroom 6
12:30 pm-1:30 pm	**EAST Committee & Task Force Meetings**	
	Annual Scientific Assembly Committee	Turks 4
	Career Development Committee	Turks 3
	Development Committee	Turks 5
	Emergency General Surgery Committee	Caicos 2
	Equity, Quality, & Inclusion in Trauma Surgery Practice Ad Hoc Task Force	Caicos 6
	Guidelines Committee	Caicos 1
	Injury Control & Violence Prevention Committee	Caicos 4
	Manuscript & Literature Review Committee	Caicos 3
	Member Recruitment & Retention Committee	Turks 1
	Multicenter Trials Committee	Turks 2

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)*	Grand Caribbean Ballrooms 8-10
1:45 pm-3:45 pm	**Scientific Session III-A: EAST Multicenter Trials** *(Papers 11-16)* Moderators: Sandra DiBrito, MD, PhD & Jeffry Nahmias, MD, MHPE	Grand Caribbean Ballroom 7
1:45 pm-3:45 pm	**Scientific Session III-B: Cox-Templeton Injury Prevention Paper Competition** *(Papers 17-22)* Moderators: Hee Soo Jung, MD & Alison A. Smith, MD, PhD *(2019 Recipient)*	Kingston Hall
3:45 pm-4:00 pm	Afternoon Break - Refreshments provided in the Exhibit Hall	Grand Caribbean Ballroom 6
4:00 pm-5:20 pm	**Parallel Plenary Session** Trauma, Emergency, and Humanitarian Surgery in Austere Settings: Cases, Ethical Conundrums, and Compromises *Presented by the EAST Military Committee & EAST Emergency General Surgery Committee* Moderators: Stephanie Streit, MD & D. Dante, Yeh, MD	Grand Caribbean Ballroom 7
4:00 pm-5:20 pm	**Parallel Plenary Session** Traditional Surgical M&M vs. Just Culture Principles: A Better Way to Learn from our Mistakes *Presented by the EAST Quality, Safety, and Outcomes Committee* Moderator: Scott Armen, MD	Kingston Hall

EAST Receptions & Special Events:

5:30 pm-7:00 pm	Society of Trauma Nurses (STN) Networking Reception *(By invitation only)*	Grand Caribbean Ballrooms 1-2
6:00 pm-10:00 pm	Kids Klub Party *(Pre-Registration Required!)*	Loews Royal Pacific Resort Oceana 8-10
6:30 pm-9:30 pm	EAST President's Reception & Dinner *(By invitation only)*	Loews Royal Pacific Resort Tahitian Room

Industry Events:

5:30 pm-8:30 pm	Z-Medica Industry Education Symposium	Grand Caribbean Ballrooms 3-4
5:30 pm-8:30 pm	Zimmer Biomet Industry Education Symposium	Grand Caribbean Ballrooms 11-12
6:00 pm-8:00 pm	EAST Think Group hosted by KCI An Acelity Company (KCI)	Grand Caribbean Ballroom 5

A Mother's Room is available in the Meeting Planner Office 3

Eastern Association for the Surgery of Trauma
33rd EAST Annual Scientific Assembly
January 14-18, 2020
OVERALL SCHEDULE

FRIDAY, JANUARY 17, 2020

6:30 am-10:00 am	Registration	Grand Caribbean Pre-Function North
6:30 am-1:00 pm	Speaker Preparation Room	St. Croix 3
7:00 am-12:00 pm	EAST Development Fund & Information Kiosks	Grand Caribbean Pre-Function North
6:45 am-10:00 am	Exhibits	Grand Caribbean Ballroom 6
6:45 am-8:15 am	Continental Breakfast provided in the Exhibit Hall	Grand Caribbean Ballroom 6
7:00 am-7:40 am	**EAST Awards Ceremony & Recognition & Gavel Exchange** *Open to all meeting attendees* • EAST Milestone Donors Recognition • EAST Mentor Recognition • Raymond H. Alexander, MD Resident Paper Competition • Best Manuscript Award • EAST Oriens Award • John P. Pryor, MD Distinguished Service in Military Casualty Care Award • John M. Templeton, Jr., MD Military Call to Service Scholarship • Cox-Templeton Injury Prevention Paper Award • 2020 John M. Templeton, Jr., MD Injury Prevention Research Scholarship • 2020 Trauma Research Scholarship • 2020 Multicenter Trials Junior Investigator Award • 2019 Health Policy and Management Scholarship Recipient • 2019 Leadership Agility Program Scholarship Recipients • 2019 Promising Leaders Program Scholarship Recipient • 2020 Society of Trauma Nurses/EAST Nurse Fellow Recipient • 2020 Leadership Development Workshop Scholarship Recognition	Grand Caribbean Ballroom 7
7:45 am-9:45 am	**Scientific Session IV-A: Resuscitation and Transfusion** *(Papers 23-28)* Moderators: George Kasotakis, MD, MPH & Stephanie Savage, MD, MS	Grand Caribbean Ballroom 7
7:45 am-9:45 am	**Scientific Session IV-B: Acute Care Surgery** *(Papers 29-34)* Moderators: Rondi Gelbard, MD & Kevin Schuster, MD, MPH	Kingston Hall
9:45 am-10:00 am	Morning Break - Last call in the Exhibit Hall!	Grand Caribbean Ballroom 6
10:00 am-11:00 am	**Parallel Plenary Session** **Equity on the Front Lines of Trauma Surgery: An #EAST4ALL Roundtable** *Presented by the EAST Equity, Quality, and Inclusion in Trauma Surgery Practice Ad Hoc Task Force* Moderator: Andrew Bernard, MD & D'Andrea Joseph, MD	Grand Caribbean Ballroom 7
10:00 am-11:00 am	**Parallel Plenary Session** **Next Generation Pediatric Trauma Management** *Presented by the Pediatric Trauma Society and the EAST Guidelines Committee* Moderator: Christian Streck, Jr., MD	Kingston Hall
10:00 am-2:00 pm	Exhibit Tear-down	Grand Caribbean Ballroom 6
11:15 am-12:00 pm	**Scott B. Frame, MD Memorial Lecture** ***Ensuring Patient Trust*** **Julie A. Freischlag, MD, FACS**	Grand Caribbean Ballroom 7

A Mother's Room is available in the Meeting Planner Office 3

FRIDAY, JANUARY 17, 2020 (CONTINUED)

12:00 pm-1:15 pm	Grab & Go Lunch – Grab some lunch provided by EAST or pre-register & attend an "Industry Sponsored Lunch & Learn Session"!	Grand Caribbean Pre-Function North

Industry Events:

12:00 pm-1:00 pm	DePuy Synthes Lunch & Learn Session	Grand Caribbean Ballrooms 1-2
12:00 pm-1:00 pm	Portola Pharmaceuticals Lunch & Learn Session	Grand Caribbean Ballrooms 3-5

12:00 pm-1:00 pm — **EAST Committee & Task Force Meetings**

Burn Surgery Committee	Turks 1
Mentoring Committee	Turks 2
Military Committee	Caicos 1
Minimally Invasive Surgery/Emerging Technologies (MISET) Ad Hoc Task Force	Turks 3
Quality, Safety and Outcomes Committee	Caicos 2
Online Education Committee	Grand Caribbean Ballrooms 8-10
Research-Scholarship Committee	Turks 4
Seniors Committee	Turks 5

1:00 pm-2:15 pm — **Parallel Plenary Session** — Grand Caribbean Ballroom 7
Engage the Masters
Presented by the EAST Career Development Committee
Moderators: Jennifer Knight Davis, MD, Stefan Leichtle, MD, Jessica Summers, MD, Bryce Robinson, MD, MS and Edgardo Salcedo, MD

1:00 pm-2:15 pm — **Parallel Plenary Session** — Kingston Hall
EAST Master Class Video Session
Presented by the EAST Annual Scientific Assembly Program Committee
Moderators: Matthew Lissauer, MD, Niels Martin, MD & Adrian Maung, MD

2:30 pm-4:30 pm — **Parallel Plenary Session** — Grand Caribbean Ballroom 7
Practice Management Guidelines (PMGs)
Presented by the EAST Guidelines Committee
Moderators: John J. Como, MD, MPH & Nicole Fox, MD, MPH

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

Emergency General Surgery
- Management of Acute Lower Gastrointestinal Bleeding-Rondi Gelbard, MD
- Management of Gallbladder Disease in Pregnancy-Jaswin Sawhney, MD

Surgical Critical Care
- Management of Pleural Effusion in Ventilator-Dependent Critical Care Patients-William Chiu, MD
- Endotrachael Intubation Following Trauma-John Lunde, DNP, ARNP, TNS

Trauma
- Renal Trauma-Hiba Abdel Aziz, MD
- Open Abdomen Management-Eric Mahoney, MD
- Hemothorax Management-Nimitt Patel, MD
- Utilization of Thromboelastography in Acutely Bleeding Trauma & Critically Ill Surgical Patients-Nikolay Bugaev, MD
- Treatment of Traumatic Rhabdomyolysis-Jaswin Sawhney, MD

2:30 pm-4:30 pm — **Parallel Plenary Session** — Grand Caribbean Ballrooms 8-10
You Have Entered the Twilight Zone Part II
Dollars & Sense: Financial Planning Strategies from Start to Finish
Presented by the EAST Mentoring Committee and the EAST Seniors Committee
Moderator: Thomas Duncan, DO & Ronald Gross, MD

EAST Receptions & Special Events:

4:45 pm-6:45 pm	EAST Closing Party	Cayman Court Lawn

A Mother's Room is available in the Meeting Planner Office 3

Eastern Association for the Surgery of Trauma
33rd EAST Annual Scientific Assembly
January 14-18, 2020
OVERALL SCHEDULE

SATURDAY, JANUARY 18, 2020

7:00 am-8:30 am	EAST Board of Directors Meeting *(By invitation only)*	Grand Caribbean Ballrooms 11-12
7:30 am-5:00 pm	**Trauma Outcomes Performance Improvement Course *(TOPIC)*** *Presented by the Society of Trauma Nurses (STN)*	Grand Caribbean Ballrooms 8-10

A Mother's Room is available in the Meeting Planner Office 3

Eastern Association for the Surgery of Trauma (EAST)
33rd Annual Scientific Assembly
SCIENTIFIC SESSIONS

WEDNESDAY, JANUARY 15, 2020

7:30 am-11:15 am Short Courses – Pre-registration Required

Short Course #1
Making the GRADE: The Art and Science of Creating High Quality Practice Management Guidelines
Presented by the EAST Guidelines Committee
Location: Grand Caribbean Ballrooms 1-2
Moderator: George Kasotakis, MD, MPH
Speakers:

7:30 am-7:40 am	Introductions & Welcome – John Como, MD, MPH & Shailvi Gupta, MD, MPH
7:40 am-8:00 am	Steps Toward Generating a High-Quality PMG using GRADE – George Kasotakis, MD, MPH & Srinivas Reddy, MD
8:00 am-8:20 am	Generating PICOs – Julius Cheng, MD, MPH & Nimitt Patel, MD
8:20 am-8:40 am	Systematic Literature Search & Abstracts – Hiba Abdel Aziz, MD & Krista Haines, DO
8:40 am-9:00 am	Manuscript Review & Data Extraction – John Lunde, DNP, ARNP, TNS & Brian Williams, MD
9:00 am-9:20 am	Creating Recommendations – Rishi Rattan, MD & Kaushik Mukherjee, MD, MSCI
9:20 am-10:00 am	RevMan & Introduction to Meta-Analysis – Nikolay Bugaev, MD & Lisa Kodadek, MD
10:00 am-10:40 am	Using GRADEpro Software – Jin Ra, MD & Nicole Fox, MD, MPH
10:40 am-11:15 am	Small Group Demonstrations of RevMan and GRADEpro Software

Short Course #2
Surgical Research Boot Camp: From Idea to Publication, Funding, and Beyond
Presented by the EAST Research-Scholarship Committee and the EAST Multicenter Trials Committee
Location: Grand Caribbean Ballrooms 3-5
Speakers: Rachael Callcut, MD, MSPH & John Harvin, MD, MS

- Personal development: finding the right mentor, advanced training in basic science/clinical research, identification of a topic and evaluation of the present evidence to identify gaps in knowledge
- Funding opportunities: internal awards, society grants, philanthropic organizations, industry funding
- IRB and Consent
- Creating preliminary data: trauma registry
- Creating preliminary data: surveys
- Creating preliminary data: observational studies
- Creating preliminary data: large dataset research
- Creating preliminary data: multi-center studies
- How to respond to rejection and revisions
- Meet the Researchers, Tips and Tricks for Success

Short Course #3
Prevention is the Best Medicine: Building and Maintaining a High-Quality Injury Prevention Program in Any Setting
Presented by the EAST Injury Control and Violence Prevention Committee & the Society of Trauma Nurses
Location: Grand Caribbean Ballrooms 8-10
Moderators: Courtney Edwards, DNP, MPH, RN, CCRN, CEN, TCRN, NEA-BC & Rachel Rodriguez, MD
Speakers:
Karen Macauley, DHA, Med, BSN, TCRN, CEN - Understanding the STN Recommendations for Injury Prevention Programs Based on Trauma Center Level and Resources
Christine Claborn, MSN, RN, CEN, TCRN - How to Develop Injury Prevention Programs with Low Resources
Jason Higginson, MD, Captain, USN - Military Injury Prevention: Preventing Deaths Outside the Combat Zone
Barbara Barlow, MD, Founder of The Injury Free Coalition - Growing a Multicenter Injury Prevention Program from its Origins in Harlem-Anchored in Research, Education, and Advocacy

WEDNESDAY, JANUARY 15, 2020 continued

Short Course #4
Trauma Quality: A Hands-On Approach to Trauma PI/QA and Multidisciplinary Trauma Peer Review
Presented by the EAST Quality, Safety, and Outcomes Committee
Location: Grand Caribbean Ballrooms 11-12
Facilitators: Kyle Cunningham, MD, MPH, Jose Diaz, MD, Jordan Estroff, MD, Sarah Mattocks, MSN, FNP-C, Jonathan Messing, MSN, ACNP-BC, Babak Sarani, MD, Jason Saucier, MSN, AGACNP-BC, Kevin Schuster, MD, MPH, & Glen Tinkoff, MD

7:30 am-7:35 am Introduction – Jose Diaz, MD & Babak Sarani, MD

Trauma PI QA

7:35 am-7:50 am	The Trauma Outcomes Dashboard & TQIP Metrics for the PI Projects – Sarah Mattocks, MSN, FNP-C & Kevin Schuster, MD, MPH
7:50 am-8:30 am	Group Session: Dashboard and TQIP Reports Review/Table Discussion (Attendees are encouraged to bring institutional dashboards)
8:30 am-8:55 am	Group Presentations: PI Projects (Actionable Correction Strategy Presentations) Moderators: Kyle Cunningham, MD, Sarah Mattocks, MSN, FNP-C, & Kevin Schuster, MD, MPH

Multidisciplinary Trauma Peer Review Committee

8:55 am-9:05 am	Multidisciplinary Trauma Peer Review Committee – Babak Sarani, MD & Glen Tinkoff, MD
9:05 am-9:35 am	Group Session: Multidisciplinary Trauma Peer Review Committee – Trauma Peer Review Tool
9:35 am-10:10 am	Group Presentations: Case Presentations-Categorizing and Identified Relevant Variances Moderators: Jordan Estroff, MD, Babak Sarani, MD, & Glen Tinkoff, MD

Medical Peer Review

10:10 am-10:25 am	The Peer Review Intervention – Jose Diaz, MD & Glen Tinkoff, MD
10:25 am-10:55 am	Group Session: Adjudicate Cases Presented Related to Peer-Related Issues Using "Just Culture" Methodology with a sample "Trauma Case Review Tool"/Table Discussion
10:55 am-11:15 am	Group Presentations: Adjudication of Recommendations and Peer-Related Issues Identified Presentations Moderators: Jose Diaz, MD, Jordan Estroff, MD, & Jonathan Messing, MSN, ACNP-BC

12:00 pm-12:30 pm **Opening Ceremony - Flag Presentation and Opening Remarks**
Location: Grand Caribbean Ballroom 7

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

Presiding: Elliott R. Haut, MD, PhD & Vijaya T. Daniel, MD, MPH

12:30 pm-2:10 pm

Location: Grand Caribbean Ballroom 7

12:30 pm	#1	TREATMENT OF BLUNT CEREBROVASCULAR INJURIES: ANTICOAGULANTS OR ANTIPLATELETS? Presenter: Kamil Hanna, MD Discussant: Laura Kreiner, MD
12:50 pm	#2	VISCOELASTIC TESTING IN COMBAT RESUSCITATION: TIME FOR A NEW STANDARD? Presenter: Daniel T. Lammers, MD Discussant: Lucy Kornblith, MD
1:10 pm	#3	RIB FIXATION IN GERIATRIC TRAUMA: MORTALITY BENEFITS FOR THE MOST VULNERABLE PATIENTS Presenter: Roger C. Zhu, MD Discussant: Jennifer Knight Davis, MD
1:30 pm	#4	IMPACT OF MARIJUANA ON VENOUS THROMBOEMBOLIC EVENTS: CANNABINOIDS CAUSE CLOTS IN TRAUMA PATIENTS Presenter: Jack Stupinski, MD Discussant: Walt Biffl, MD
1:50 pm	#5	HYPERTONIC SALINE RESUSCITATION IN TRAUMA FOLLOWING DAMAGE CONTROL LAPAROTOMY: DOES IT ATTENUATE INFLAMMATION Presenter: Patrick M. McCarthy, MD Discussant: Joseph Fernandez-Moure, MD, MS
2:10 pm-2:30 pm		Break – Refreshments in the Exhibit Area

WEDNESDAY, JANUARY 15, 2020 continued

SCIENTIFIC SESSION II – RAYMOND H. ALEXANDER, MD RESIDENT PAPER COMPETITION
Presiding: A. Britton Christmas, MD & Woo S. Do, MD
2:30 pm-4:10 pm
Location: Grand Caribbean Ballroom 7

2:30 pm	#6	SAVE IT - DON'T WASTE IT! MAXIMIZING UTILIZATION OF ERYTHROCYTES FROM PREVIOUSLY STORED WHOLE BLOOD Presenter: Kasiemobi Pulliam, MD Discussant: John R. Taylor, III, MD
2:50 pm	#7	DOXYCYCLINE IMPROVES TRAUMATIC BRAIN INJURY OUTCOMES IN MURINE MODEL Presenter: Adil J. Malek, MD Discussant: Jose L. Pascual, MD, PhD
3:10 pm	#8	VALIDATION OF A NOVEL PARTIAL REBOA DEVICE IN A SWINE HEMORRHAGIC SHOCK MODEL: FINE TUNING FLOW TO OPTIMIZE BLEEDING CONTROL AND REPERFUSION INJURY Presenter: Dominic M. Forte, MD Discussant: Letitia Bible, MD
3:30 pm	#9	INJURY AND SHOCK DRIVEN EFFECTS ON PLATELET AGGREGOMETRY: A CAUTIONARY TALE OF PHENOTYPING Presenter: Nichole E. Starr, MD, MPH Discussant: Niels Martin, MD
3:50 pm	#10	ACTIN IS ASSOCIATED WITH TISSUE INJURY IN TRAUMA PATIENTS AND PRODUCES A HYPERCOAGULABLE PROFILE IN VITRO Presenter: Julia R. Coleman, MD, MPH Discussant: Vanessa Nomellini, MD, PhD

End of Raymond H. Alexander, MD Resident Paper Competition

4:15 pm-5:15 pm **Opening Keynote – Presidential Address**
EAST Practice Management Guidelines and the Perpetual Quest for Excellence
Elliott R. Haut, MD, PhD, FACS
Location: Grand Caribbean Ballroom 7

5:20 pm-6:20 pm **EAST Annual Business Meeting –** *Open to all EAST Members*
Location: Grand Caribbean Ballroom 7

THURSDAY, JANUARY 16, 2020

7:00 am-8:00 am
No Suit, No Problem Networking Breakfast
Presented by the EAST Career Development Committee
Location: Kingston Hall

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: Grand Caribbean Ballroom 7
8:15 am-8:50 am Keynote Address
Harnessing Your Passion and Connecting to Purpose
Eileen Bulger, MD, FACS

8:50 am-9:00 am 2020 EAST Oriens Essay Presentations
Resident Winner – Mike Mallah, MD
Fellow Winner – Christina Riojas, MD

QUICK SHOTS PARALLEL SESSION I

Presiding: Mayur Patel, MD, MPH & Callie Thompson, MD

9:00 am-10:00 am

Location: Grand Caribbean Ballroom 7

9:00 am	#1	BRAIN INJURY GUIDELINES - MODIFIED ADMISSION CRITERIA (BIG-MAC) IMPROVED ACCURACY IN TRIAGE FOR PATIENTS WITH TRAUMATIC BRAIN INJURY Presenter: Laura Harmon, MD
9:06 am	#2	NATIONWIDE ANALYSIS OF WHOLE BLOOD HEMOSTATIC RESUSCITATION IN CIVILIAN TRAUMA Presenter: Kamil Hanna
9:12 am	#3	GETTING BETTER WITH TIME? A TEMPORAL ANALYSIS OF THE AORTA REGISTRY Presenter: Marko Bukur, MD
9:18 am	#4	BLUNT CEREBROVASCULAR INJURY SCREENING CRITERIA SHOULD INCLUDE HIGH SPEED MOTOR VEHICLE CRASHES Presenter: Ashley Farhat-Sabet, BS
9:24 am	#5	CONTEMPORARY MANAGEMENT OF TRAUMATIC ESOPHAGEAL INJURIES: THE RESULTS OF AN EASTERN ASSOCIATION FOR THE SURGERY OF TRAUMA MULTI-INSTITUTIONAL STUDY Presenter: Lauren Raff, MD
9:30 am	#6	DIRECT TO OPERATING ROOM TRAUMA RESUSCITATION: OPTIMIZING PATIENT SELECTION AND TIME-CRITICAL OUTCOMES WHEN MINUTES COUNT Presenter: Amelia Johnson, PA-C
9:36 am	#7	THERAPEUTIC ANTICOAGULATION IN PATIENTS WITH TRAUMATIC BRAIN INJURIES AND PULMONARY EMBOLI Presenter: Amanda M. Chapman, MD
9:42 am	#8	MASSIVE TRANSFUSION WITH WHOLE BLOOD IS SAFE COMPARED TO COMPONENT THERAPY Presenter: Jared Gallaher, MD, MPH
9:48 am	#9	THE IMPACT OF ANTIPLATELET (AP) AND ANTICOAGULANT(AC) AGENTS ON OUTCOMES IN GERIATRIC PATIENTS WITH TRAUMATIC BRAIN INJURY (TBI) Presenter: Mira Ghneim, MD
9:54 am	#10	INTO THE WILD AND ONTO THE TABLE - A MULTICENTER ANALYSIS OF WILDERNESS FALLS Presenter: Matthew D. Bernard

Quick Shots Parallel Session II
Presiding: David Morris, MD & Ruby Skinner, MD
9:00 am-10:00 am
Location: Kingston Hall

9:00 am	#11	PULL BACK THE CURTAIN: EXTERNAL DATA VALIDATION IS AN ESSENTIAL ELEMENT OF QUALITY IMPROVEMENT BENCHMARK REPORTING Presenter: Jill L. Jakubus, PA-C
9:06 am	#12	DISPARITIES IN RURAL VS URBAN FIELD TRIAGE: RISK AND MITIGATING FACTORS FOR UNDERTRIAGE Presenter: Andrew-Paul Deeb, MD
9:12 am	#13	ELECTRONIC TRAUMA RESUSCUTIATION DOCUMENTATION AND DECISION SUPPORT USING T6 HEALTH SYSTEMS MOBILE APPLICATION: A COMBAT TRAUMA CENTER PILOT PROGRAM Presenter: Lisa Angotti, MD, MS
9:18 am	#14	RISK ASSESSMENT FOR INTRA-ABDOMINAL INJURY FOLLOWING BLUNT TRAUMA IN CHILDREN: DERIVATION AND VALIDATION OF A MACHINE LEARNING MODEL Presenter: Christopher Pennell, MD
9:24 am	#15	THE ELUSIVE TRAUMA DENOMINATOR: FEASIBILITY OF COMBINING DATASETS TO QUANTIFY THE TRUE BURDEN OF FIREARM INJURY Presenter: Heather E. Carmichael, MD
9:30 am	#16	PUTTING A HALT TO UNNECESSARY TRANSFERS: DO PATIENTS WITH ISOLATED SUBARACHNOID HEMORRHAGE NEED A TRAUMA CENTER? Presenter: Danielle L. DeFoe, DO
9:36 am	#17	PREHOSPITAL END TIDAL CARBON DIOXIDE PREDICTS MASSIVE TRANSFUSION AND DEATH FROM TRAUMA Presenter: Eric M. Campion, MD
9:42 am	#18	MISSION GROUND TIME AND ITS IMPACT ON THE COVERAGE OF FATAL MOTOR VEHICLE INCIDENTS IN ALABAMA Presenter: Weston A. Smedley, BSc
9:48 am	#19	THE GERIATRIC TRAUMA PATIENT: A NEGLECTED INDIVIDUAL IN A MATURE TRAUMA SYSTEM Presenter: Eric H. Bradburn, DO, MS
9:54 am	#20	CAUSES OF DEATH FOLLOWING DISCHARGE AFTER TRAUMA IN NORTH CAROLINA Presenter: Mary K. Bryant, BS, MD
10:00 am-10:15 am		Morning Break – Visit the Exhibit Hall – Grand Caribbean Ballroom 6

THURSDAY, JANUARY 16, 2020 continued

10:15 am-11:15 am **Parallel Plenary Session**

2019 Landmark Papers in Acute Care Surgery
Presented by the EAST Manuscript and Literature Review Committee
Location: Grand Caribbean Ballroom 7

Moderator: Martin Zielinski, MD
Landmark Paper Presentations:
April Grant, MD - Adult Trauma-*EAST Manuscript and Literature Review Committee*
Christian Streck, Jr., MD - Pediatric Trauma-*Pediatric Trauma Society*
Travis Polk, MD - Military Trauma-*EAST Military Committee*
Callie Thompson, MD - Injury Prevention-*EAST Injury Control and Violence Prevention Committee*
Callie Thompson, MD - Burn Surgery-*EAST Burn Surgery Ad Hoc Task Force*
Alexandra Briggs, MD - Surgical Critical Care-*EAST Manuscript and Literature Review Committee*
Rondi Gelbard, MD - Emergency General Surgery-*EAST Emergency General Surgery Committee*
Asanthi Ratnasekera, DO - Mentorship-*EAST Mentoring Committee*
Tanya Zakrison, MD, MPH - Equity in Trauma-*EAST Equity, Quality, and Inclusion in Trauma Surgery Practice Ad Hoc Task Force*
Scott Welle, DO - Emerging Tech-*EAST Minimally Invasive Surgery & Emerging Technologies Ad Hoc Task Force*
Jose Pascual, MD, PhD - Quality, Safety and Outcomes - *EAST Quality, Safety and Outcomes Committee*

10:15 am-11:15 am **Parallel Plenary Session**

Injury Prevention Advocacy: How to Find Your Voice
Presented by the EAST Injury Control and Violence Prevention Committee
Location: Kingston Hall

Trauma is the leading cause of death for people up to age 45 and remains the fourth leading cause of death for all ages. Trauma, by definition, is preventable. As trauma surgeons, our career is devoted to helping people recover from injury, but our unique perspective is essential to an understanding of the risk factors for injury, understanding the impact to society, and helping people to understand why injury prevention is necessary. Unfortunately, many physicians may be unsure of how to approach advocacy or to visualize what alternative career paths exist in the fields of advocacy and public policy. Finally, certain employers may place or suggest restrictions on how physicians can use their voice, particularly in politically charged topics such as violence prevention.

This course aims to guide healthcare providers who wish to be involved in injury prevention advocacy. This course will clarify the legal questions for physicians engaging with legislators, provide effective strategies for presenting a message effectively, and discuss pathways for physicians interested in public policy and advocacy.

Moderator: Rachel Rodriguez, MD
Speakers:
Amy Liepert, MD – Understanding Advocacy, Lobbying, and How to Navigate the Environment as a Physician
Kyle Fischer, MD – Pathways to Become Involved in Advocacy
Ross Goldberg, MD – Advocacy at the National Level

QUICK SHOTS PARALLEL SESSION III

Presiding: Kyle Cunningham, MD, MPH & Brian Williams, MD

11:15 am-12:15 pm

Location: Grand Caribbean Ballroom 7

11:15 am	#21	RELATIONSHIP OF BODY MASS INDEX, SERUM CREATINE KINASE, AND ACUTE KIDNEY INJURY AFTER SEVERE TRAUMA Presenter: Charles R. Vasquez, MD
11:21 am	#22	CAN EDUCATIONAL VIDEOS REDUCE OPIOID CONSUMPTION IN TRAUMA INPATIENTS? A CLUSTER-RANDOMIZED PILOT STUDY Presenter: Esther S. Tseng, MD
11:27 am	#23	THE SCALES OF RECOVERY: BALANCING POSTTRAUMATIC STRESS WITH RESILIENCY IN THE VIOLENTLY INJURED Presenter: Andrew Wheeler, LCSW
11:33 am	#24	RACIAL INEQUALITY IN THE TRAUMA OF WOMEN: A DISPROPORTIONATE DECADE Presenter: Shawn Izadi, BS
11:39 am	#25	DOWNSTREAM EFFECTS OF A COMPREHENSIVE TRAUMA RECOVERY SERVICES PROGRAM Presenter: Vanessa Ho, MD, MPH
11:45 am	#26	FEASIBILITY OF A TRAUMA QUALITY OF LIFE FOLLOW UP CLINIC Presenter: Colleen M. Trevino, NP, PhD
11:51 am	#27	MAKING THE NEWS: VICTIM CHARACTERISTICS ASSOCIATED WITH MEDIA REPORTING ON FIREARM VIOLENCE Presenter: Elinore J. Kaufman, MD
11:57 am	#28	FLAIM: A DEEP NEURAL NETWORK (DNN) BASED APPROACH TO EARLY PREDICT MORTALITY IN TRAUMA PATIENTS ADMITTED TO THE ICU Presenter: Fahad S. Ahmed, MD
12:03 pm	#29	DEATHS FOLLOWING WITHDRAWAL OF LIFE SUSTAINING THERAPY REPRESENT OPPORTUNITIES FOR QUALITY IMPROVEMENT Presenter: Matthew P. Guttman, MD
12:09 pm	#30	NO NEWS IS GOOD NEWS? THE 3-YEAR MORTALITY RATES OF OCTOGENARIAN AND NONAGENARIAN PATIENTS FOLLOWING EMERGENCY GENERAL SURGERY Presenter: John Hwabejire, MD, MPH

QUICK SHOTS PARALLEL SESSION IV

Presiding: Brian Gavitt, MD, MPH & Christina Riojas, MD

11:15 am-12:15 pm

Location: Kingston Hall

11:15 am	#31	IDENTIFICATION OF A NEW GENETIC VARIANT ASSOCIATED WITH CHOLECYSTITIS: A MULTICENTER GENOME-WIDE ANALYSIS Presenter: Apostolos Gaitandis, MD
11:21 am	#32	ASSOCIATION BETWEEN HOSPITAL LEVEL COMPUTED TOMOGRAPHY RESOURCES AND OUTCOMES FOR ACUTE ABDOMEN Presenter: Kevin Ricci, MD, MS
11:27 am	#33	THE BURDEN OF ENTEROCUTANEOUS FISTULA AFTER EMERGENCY SURGERY DISCHARGE: MORTALITY AND READMISSION RATES Presenter: Justin Hatchimonji, MD, MBE
11:33 am	#34	ADMISSION PREDICTORS OF MORTALITY AND LIMB LOSS FOLLOWING NECROTIZING SOFT TISSUE INFECTION Presenter: Dara L. Horn, MD
11:39 am	#35	PLATELET DYSFUNCTION IN PATIENTS WITH TRAUMATIC INTRACRANIAL HEMORRHAGE: DO DESMOPRESSIN AND PLATELET THERAPY HELP OR HARM? Presenter: Nina Glass, MD
11:45 am	#36	EARLY COGNITIVE IMPAIRMENT IS COMMON AFTER INTRACRANIAL HEMORRHAGE WITH MILD TRAUMATIC BRAIN Presenter: Areg Grigorian, MD
11:51 am	#37	VENOUS THROMBOEMBOLISM FOLLOWING PENETRATING FEMORAL AND POPLITEAL ARTERY INJURIES: AN OPPORTUNITY FOR INCREASED PREVENTION Presenter: Odessa Pulido, DO
11:57 am	#38	TO ANGIO OR NOT TO ANGIO: AN ANALYSIS FROM THE AAST PROOVIT STUDY GROUP Presenter: Ahmed F. Khouqeer, MD
12:03 pm	#39	VALIDATION OF HEART RATE VARIABILITY AS A MEASUREMENT OF REAL-TIME SURGEON STRESS Presenter: Johnathan R. Kent, MD
12:09 pm	#40	AUTOLOGOUS SKIN CELL SUSPENSION REDUCES LENGTH OF STAY FOR BURN INJURIES Presenter: Blake J. Platt, MD, MHS
12:15 pm-1:30 pm		**Grab & Go Lunch**

PARALLEL SCIENTIFIC SESSION III-A – EAST MULTICENTER TRIALS

Presiding: Sandra DiBrito, MD, PhD & Jeffry Nahmias, MD, MHPE

1:45 pm-3:45 pm

Location: Grand Caribbean Ballroom 7

1:45 pm	#11	COLORECTAL RESECTION IN EGS – AN EAST MCT Presenter: Brittany Aicher, MD Discussant: Amy Rushing, MD
2:05 pm	#12	TEMPORARY INTRAVASCULAR SHUNTS AFTER CIVILIAN ARTERIAL INJURY: A PROSPECTIVE, MULTICENTER EAST STUDY Presenter: Lily Tung, MD Discussant: David Skarupa, MD
2:25 pm	#13	ASSOCIATION OF TXA WITH VENOUS THROMBOEMBOLISM IN BLEEDING TRAUMA PATIENTS: AN EAST MULTICENTER STUDY Presenter: Lisbi Rivas, MD Discussant: Mark Hoofnagle, MD, PhD
2:45 pm	#14	TIMING AND VOLUME OF CRYSTALLOID AND BLOOD PRODUCTS IN PEDIATRIC TRAUMA- AN EAST PROSPECTIVE MULTICENTER STUDY Presenter: Stephanie F. Polites, MD, MPH Discussant: Terri Elsbernd, MS, RN, CEN, CPEN
3:05 pm	#15	PROSPECTIVE VALIDATION OF THE EMERGENCY SURGERY SCORE (ESS) IN EMERGENCY GENERAL SURGERY: AN EAST MULTICENTER STUDY Presenter: Haytham Kaafarani, MD, MPH Discussant: Linda Dultz, MD, MPH
3:25 pm	#16	DELERIUM AND USE OF REGIONAL ANALGESIA TECHNIQUES IN OLDER ADULTS WITH MULTIPLE RIB FRACTURES: AN EAST MULTICENTER STUDY Presenter: Kathleen M. O'Connell, MD Discussant: Nimitt Patel, MD

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

Presiding: Hee Soo Jung, MD & Alison A. Smith, MD, PhD

1:45 pm-3:45 pm

Location: Kingston Hall

1:45 pm	#17	SURVIVORS OF GUN VIOLENCE AND THE EXPERIENCE OF RECOVERY: UNDERSERVED, UNDERDIAGNOSED, AND UNDERTREATED COMMUNITIES Presenter: Kathleen O'Neill, MD Discussant: Sarah Mattocks, MSN, FNP-C
2:05 pm	#18	DUSK TO DAWN: EVALUATING THE EFFECT OF A HOSPITAL BASED YOUTH VIOLENCE PREVENTION PROGRAM ON YOUTHS' PERCEPTION OF RISK Presenter: Brooke Snyder, BA Discussant: Krista Haines, DO
2:25 pm	#19	IDENTIFYING PARTICIPANTS FOR INCLUSION IN HOSPITAL BASED VIOLENCE INTERVENTION: AN ANALYSIS OF 18 YEARS OF URBAN FIREARM RECIDIVISM Presenter: Stephanie Bonne, MD Discussant: Randi Smith, MD, MPH
2:45 pm	#20	HEROES IN CRISIS: TRAUMA CENTERS SHOULD BE SCREENING FOR AND INTERVENING ON POST-TRAUMATIC STRESS IN OUR EMERGENCY RESPONDERS Presenter: Leah C. Tatebe, MD Discussant: Jennifer Hartwell, MD
3:05 pm	#21	THE HOMELESS PEDESTRIAN: A NEW CATEGORY OF VULNERABLE ROAD USER Presenter: Rebecca E. Plevin, MD Discussant: Laurie J. Punch, MD
3:25 pm	#22	DO RIDE SHARING SERVICES AFFECT THE INCIDENCE OF ALCOHOL-RELATED MOTOR VEHICLE COLLISIONS? Presenter: Vera Hendrix, MD Discussant: Jon Dorfman, MD

End of Cox-Templeton Injury Prevention Paper Competition

3:45 pm-4:00 pm Break – Visit the Exhibit Hall – Grand Caribbean Ballroom 6

THURSDAY, JANUARY 16, 2020 continued

4:00 pm-5:20 pm **Parallel Plenary Session**

Trauma, Emergency, and Humanitarian Surgery in Austere Settings: Cases, Ethical Conundrums, and Compromises
Presented by the EAST Military Committee and EAST Emergency General Surgery Committee
Location: Grand Caribbean Ballroom 7
Moderators: Stephanie Streit, MD and D. Dante Yeh, MD
Speakers/Panelists:
Kathleen O'Connell, MD – Setting the Stage: Moral/Ethical Challenges and Distress in ANY Setting
Stephanie Streit, MD – Winning the Battle but Losing the War: When the Survivable is Unlivable
Matthew Martin, MD – Pediatric Emergencies Treated in an Adult Tent: Shifting Sands & Standards of Care
Jon Simmons, MD – When the Bleeding Hasn't Stopped, But the Blood Products Have
Haytham Kaafarani, MD, MPH – Bringing a Knife to a Gunfight: Working in the High-Risk Surgical Setting
Alec Beekley, MD – Surgical Care for VIPs – Very Important Prisoners! – Autonomy, Beneficence, Privacy, & Detainee Care Conflicts
Allan Peetz, MD - Panelist

4:00 pm-5:20 pm **Parallel Plenary Session**

Traditional Surgical M&M vs. Just Culture Principles: A Better Way to Learn from Our Mistakes
Presented by the EAST Quality, Safety, and Outcomes Committee
Location: Kingston Hall
Moderator: Scott Armen, MD
Speakers:
Carrie Sims, MD – The Surgical M & M Process
Andrew Bernard, MD – The *Just Culture* Approach
Nicole Stassen, MD– Introducing *Just Culture* into Surgical M&M
Panel Discussion – Andrew Bernard, MD, Carrie Sims, MD, Nicole Stassen, MD, & Glen Tinkoff, MD

FRIDAY, JANUARY 17, 2020

7:00 am-7:40 am **EAST Awards Ceremony & Recognition**
Location: Grand Caribbean Ballroom 7
EAST Awards Ceremony & Recognition & Gavel Exchange
Open to all meeting attendees

- EAST Milestone Donors Recognition
- EAST Mentor Recognition
- Raymond H. Alexander, MD Resident Paper Competition
- Best Manuscript Award
- EAST Oriens Award
- John P. Pryor, MD Distinguished Service in Military Casualty Care Award
- John M. Templeton, Jr., MD Military Call to Service Scholarship
- Cox-Templeton Injury Prevention Paper Award
- 2020 John M. Templeton, Jr., MD Injury Prevention Research Scholarship
- 2020 Trauma Research Scholarship
- 2020 Multicenter Trials Junior Investigator Award
- 2019 Health Policy and Management Scholarship Recipient
- 2019 Leadership Agility Program Scholarship Recipients
- 2019 Promising Leaders Program Scholarship Recipient
- 2020 Society of Trauma Nurses/EAST Nurse Fellow Recipient
- 2020 Leadership Development Workshop Scholarship Recognition

PARALLEL SCIENTIFIC SESSION IV-A – RESUSCITATION & TRANSFUSION

Presiding: George Kasotakis, MD, MPH & Stephanie Savage, MD, MS

7:45 am-9:45 am

Location: Grand Caribbean Ballroom 7

7:45 am	#23	BLOOD-BASED BIOMARKERS FOR PREDICTION OF INTRACRANIAL HEMORRHAGE AND OUTCOME IN PATIENTS WITH MODERATE OR SEVERE TRAUMATIC BRAIN INJURY Presenter: Taylor Anderson, BS Discussant: Michael Goodman, MD
8:05 am	#24	PLATELET TRANSFUSIONS DO NOT CORRECT TRAUMA INDUCED PLATELET DYSFUNCTION Presenter: Madhu Subramanian, MD Discussant: Nicole Krumrei, MD
8:25 am	#25	HEMOSTATIC POTENTIAL OF COLD-STORED WHOLE BLOOD OVER TIME: AN ASSESSMENT OF PLATELET FUNCTION AND THROMBIN GENERATION FOR OPTIMAL SHELF-LIFE Presenter: Scott Assen, MD Discussant: David Morris, MD
8:45 am	#26	OVERTRANSFUSION COMES AT A SIGNIFICANT COST: THE DOSE-DEPENDENT RELATIONSHIP BETWEEN BLOOD TRANSFUSIONS AND INFECTIONS AFTER MAJOR TRAUMA Presenter: Charlie Nederpelt, BSc Discussant: Mark Seamon, MD
9:05 am	#27	MASSIVE TRANSFUSION AND THE RESPONSE TO PREHOSPITAL PLASMA: IT IS ALL IN HOW YOU DEFINE IT Presenter: Edward Sim, MD Discussant: John Harvin, MD
9:25 am	#28	VITAMIN C IS ASSOCIATED WITH LACTATE CLEARANCE AND SURVIVAL IN SEPSIS Presenter: Saskya Byerly, MD Discussant: Tanya Anand, MD, MPH

PARALLEL SCIENTIFIC SESSION IV-B – ACUTE CARE SURGERY

Presiding: Rondi Gelbard, MD & Kevin Schuster, MD, MPH

7:45 am-9:45 am

Location: Kingston Hall

7:45 am	#29	DIAPHRAGM ULTRASOUND: A NOVEL APPROACH TO ASSESSING PULMONARY RESERVE Presenter: Sean Randazzo, BS Discussant: Charity Evans, MD, MS
8:05 am	#30	INFECTIOUS COMPLICATIONS AFTER EMERGENCY GENERAL SURGERY: A STATE-WIDE COLLABORATIVE EXPERIENCE & ASSOCIATION WITH PATIENT CARE MODELS Presenter: Kathleen To, MD Discussant: Vanessa Ho, MD, MPH
8:25 am	#31	OBESITY STARTS EARLY AFTER COMBAT AMPUTATION AND COMES WITH THE RISK OF MULTIPLE CO-MORBIDITIES Presenter: Robert Conrad, MD Discussant: Stephanie Streit, MD
8:45 am	#32	USE OF GEOGRAPHIC INFORMATION SYSTEMS (GIS) SOFTWARE TO MAP HOTSPOTS FOR PENETRATING INJURIES AND IMPROVE LOCATION SELECTION FOR STOP THE BLEED INTERVENTIONS Presenter: Chase Knickerbocker, MD, MHP Discussant: Evan Wong, MD, MPH
9:05 am	#33	DO EARLY NON-STEROIDAL ANTI-INFLAMMATORY DRUGS FOR ANALGESIA WORSEN ACUTE KIDNEY INJURY AFTER SEVERE TRAUMA? A PROPENSITY SCORE ANALYSIS Presenter: Gabrielle Hatton, MD Discussant: Zaffer Qasim, MBBS
9:25 am	#34	SIMULATION-BASED OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE) FOR THE EVALUATION AND TRAINING OF ADVANCED SURGICAL SKILLS IN TRAUMA Presenter: Pablo Achurra, MD Discussant: Hee Soo Jung, MD

10:00 am-11:00 am **Parallel Plenary Session**

Equity on the Front Lines of Trauma Surgery: An #EAST4ALL Roundtable

Presented by the EAST Equity, Quality, and Inclusion in Trauma Surgery Practice Ad Hoc Task Force
Location Grand Caribbean Ballroom 7

Moderators: Andrew Bernard, MD & D'Andrea Joseph, MD
10:00 am-10:02 am Introduction – Stephanie Bonne, MD
10:02 am-10:10 am EAST4ALL Survey Results – Esther Tseng, MD & Brandon Bruns, MD
10:10 am-10:50 am Case Presentations and Panel Discussion

- Case 1 – The Customer is Always Right?: Responding to Racial Bias from a Patient
  Case 2 – Equal Work for Equal Pay?: Addressing the Gender Pay Gap
- Case 3 – Moving from the Unconscious to Heightened Consciousness: Microaggressions, Implicit Bias, and Macro Policy
- Case 4 – Righteous Indignation or Angry Mob?: Social Justice versus Social Media

10:50 am-11:00 am Introduction of the EAST4All Toolkit – Rondi Gelbard, MD & Mark Hoofnagle, MD, PhD

Panel–Stephanie Bonne, MD, Bellal Joseph, MD, Julie Freischlag, MD, Nicole Goulet, MD, Cathleen Khandelwal, MD, Deborah Stein, MD, MPH & Brian Williams, MD

FRIDAY, JANUARY 17, 2020 continued

10:00 am-11:00 am **Parallel Plenary Session**

Next Generation Pediatric Trauma Management
Presented by the EAST Guidelines Committee and the Pediatric Trauma Society
Location Kingston Hall

Moderator: Christian Streck, Jr., MD
Speakers:
Christian Streck, Jr., MD – Identifying Children at Very Low Risk for Intra-Abdominal Injury
John Draus, MD – PTS/EAST Recommendations for Management of Stable Pediatric Blunt Renal Trauma
Regan Williams, MD, MSE – Updated American Pediatric Surgical Association Blunt Liver & Spleen Injury Guideline
John Petty, MD – Prophylaxis Against Venous Thromboembolism in Pediatric Trauma
Adam Vogel, MD – Massive Transfusion Protocols in Children

11:15 am-12:00 pm **Closing Keynote - Scott B. Frame, MD Memorial Lecture**

Ensuring Patient Trust
Julie A. Freischlag, MD, FACS
Location: Grand Caribbean Ballroom 7

1:00 pm-2:15 pm **Parallel Plenary Session**

Engage the Masters
Presented by the EAST Career Development Committee
Location: Grand Caribbean Ballroom 7
Moderators: Jennifer Knight Davis, MD, Stefan Leichtle, MD, Jessica Summers, MD, Bryce Robinson, MD, MS, & Edgardo Salcedo, MD
Masters: Martin Croce, MD, Kimberly Davis, MD, MBA, & David Shatz, MD
Case Presentations:
Leah Tatebe, MD – Stuck Between a Saw and a Hard Place
Ronnie Mubang, MD – Management of Complex Polytrauma
Chance Nichols, MD – Combined Liver, Colon and Pancreas Injuries Complicated by Pulmonary Embolism

1:00 pm-2:15 pm **Parallel Plenary Session**

EAST Master Class Video Session
Presented by the EAST Annual Scientific Assembly Program Committee
Location: Kingston Hall
Moderators: Matthew Lissauer, MD, Niels Martin, MD & Adrian Maung, MD
Surgical Videos

- Exposure of the Abdominal Aorta and Visceral Branches for Hemorrhage Control – Zachary Warriner, MD, LAC+USC Medical Center
- Big Colon Surgery, Little Incisions: Minimally Invasive Techniques in Emergent Colon Surgery – Dominic Forte, MD, Scripps Mercy Hospital Trauma Service
- Incarcerated Paraesophageal Hernia and Gastric Volvulus: Management Options for the Acute Care Surgeon – Kennith Conley Coleman, DO, West Virginia University
- Kids, Cameras, and Acute Care: Minimally Invasive Management in Pediatric Emergency General Surgery – Christopher Behr, MD, UPMC Children's Hospital of Pittsburgh
- A Novel Approach to Rib Fracture-Associated Pain: ON-Q® Painbuster Tunneling Catheter Placement Technique – Michael Truitt, MD, Methodist Dallas Medical Center

FRIDAY, JANUARY 17, 2020 continued

2:30 pm-4:30 pm **Parallel Plenary Session**

Practice Management Guidelines (PMGs)
Presented by the EAST Guidelines Committee
Location: Grand Caribbean Ballroom 7
Moderators: John J. Como, MD, MPH & Nicole Fox, MD, MPH
PMGs scheduled to be presented (*subject to change*):

Emergency General Surgery
- Management of Acute Lower Gastrointestinal Bleeding-Rondi Gelbard, MD
- Management of Gallbladder Disease in Pregnancy-Jaswin Sawhney, MD

Surgical Critical Care
- Management of Pleural Effusion in Ventilator-Dependent Critical Care Patients-William Chiu, MD
- Endotrachael Intubation Following Trauma-John Lunde, DNP, ARNP, TNS

Trauma
- Renal Trauma-Hiba Abdel Aziz, MD
- Open Abdomen Management-Eric Mahoney, MD
- Hemothorax Management-Nimitt Patel, MD
- Utilization of Thromboelastography in Acutely Bleeding Trauma & Critically Ill Surgical Patients-Nikolay Bugaev, MD
- Treatment of Traumatic Rhabdomyolysis-Jaswin Sawhney, MD

2:30 pm-4:30 pm **Parallel Plenary Session**

You Have Entered the Twilight Zone Part II – Dollars & Sense: Financial Planning from Start to Finish: Late Career & Retirement Success for Surgeons
Presented by the EAST Mentoring Committee and the Seniors Committee
Location: Grand Caribbean Ballrooms 8-10
Moderators: Thomas Duncan, DO & Ronald Gross, MD
Speakers:
Jake Whipp, MBA – Financial Planning Strategy in Stages
Benjamin Fairchild, MBA, CPA & Mia West – Tax Panning and Tips: How Taxing are the Tax Laws?
Panel Discussion
Early-Career Surgeon – Jamie Coleman, MD
Mid-Career Surgeon – Thomas Duncan, DO
Late-Career Surgeon – Ronald Gross, MD
Benjamin Fairchild, MBA, CPA
Mia West
Jake Whipp, MBA

4:30 pm Scientific Program Adjourns

SCIENTIFC ABSTRACTS

QUICK SHOT ABSTRACTS

Paper #1
January 15, 2020
12:30 pm

TREATMENT OF BLUNT CEREBROVASCULAR INJURIES: ANTICOAGULANTS OR ANTIPLATELETS?

Kamil Hanna, MD, Michael Ditillo, DO, FACS*, Samer Asmar, MD, Lourdes Castanon, MD*, Mohammad Chehab, MD, Lynn Gries, MD, Andrew L. Tang, MD*, Bellal Joseph, MD*
The University of Arizona

Presenter: Kamil Hanna, MD

Discussant: Laura Kreiner, MD, MetroHealth Medical Center

Objectives: Blunt cerebrovascular injury (BCVI) is associated with cerebrovascular accidents (CVA). Early therapy with antiplatelets or anticoagulants is recommended. There is relatively less data comparing the effectiveness of these treatments. The aim of our study was to compare outcomes between BCVI patients who received anticoagulants versus those who received antiplatelets.

Methods: We performed a (2011-2015) analysis of the Nationwide Readmission Database and included all adult trauma patients =18y who had an isolated BCVI (other body regions AIS<3). Head injury patients or those who developed a CVA during the index admission were excluded. Patients were stratified into: anticoagulants and antiplatelets. Propensity score matching was performed (1:1 ratio) to control for demographics, comorbidities, BCVI grade, distribution and severity of injuries. Outcomes were readmission with CVA, and mortality within 6 months.

Results: A total of 725 BCVI patients were identified. A matched cohort of 370 patients (antiplatelet: 185 anticoagulants: 185) was obtained. Mean age was 50+/-15y, neck-AIS was 3[3-4], and ISS was 12[9-17]. The majority of the patients (69%) had high-grade BCVI (AIS=3). Overall, 6% were readmitted with CVA and 3% died within 6-months. Patients who received anticoagulants had a lower rate of readmission with CVA (9% vs. 26%; p=0.017), and a lower rate of 6-month mortality (1.3% vs. 3.9%; p=0.01). There was no significant difference between the two groups reading the median time to stroke (9 vs. 6 days; p=0.12) **Figure 1.**

Conclusions: BCVI patients on CVA prophylaxis for BCVI have a 6% rate of stroke after discharge. Compared to antiplatelets, anticoagulants are associated with lower rates of CVA in the first 6-month post discharge. Further studies are required to identify the optimal agent to prevent CVA in this high-risk subset of trauma patients.

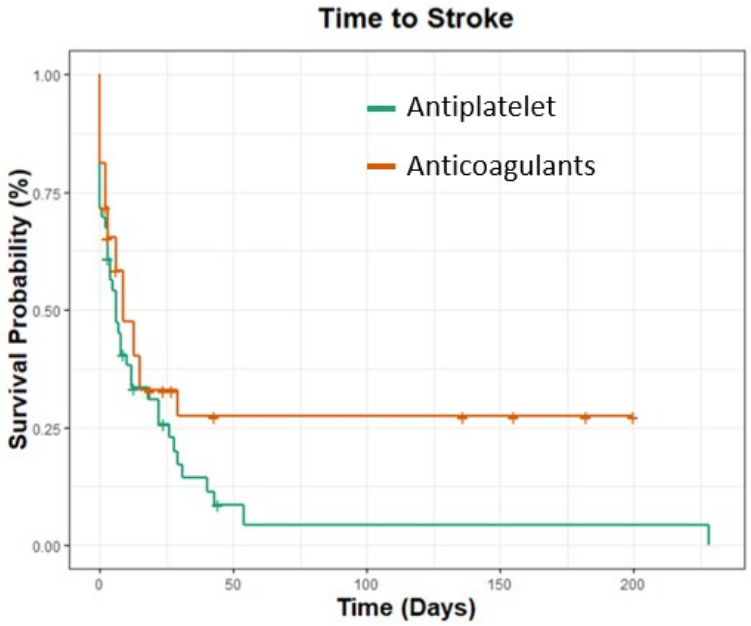


Figure 1: Time to stroke Kaplan Meier Analysis

Paper #2
January 15, 2020
12:50 pm

VISCOELASTIC TESTING IN COMBAT RESUSCITATION: TIME FOR A NEW STANDARD?

Daniel T. Lammers, MD, Christopher Marenco, MD, Kaitlin Morte, MD,
John P. Kuckelman, DO, Douglas R. Morte, MD, Jason Bingham, MD,
Matthew J. Martin, MD, FACS*, Matthew J. Eckert, MD*
Madigan Army Medical Center

Presenter: Daniel T. Lammers, MD

Discussant: Lucy Kornblith, MD, UCSF-San Francisco General Hospital

Objectives: Traumatic hemorrhage and coagulopathy represent major sources of morbidity and mortality on the modern battlefield. Viscoelastic testing (VET) offers the potential for a more personalized approach to resuscitation, although data on superiority to non-VET guided therapy is lacking. Since 2009, VET has been performed at one NATO Role III Hospital in Afghanistan. We sought to evaluate the outcomes of patients who received VET-guided resuscitation compared to standard balanced blood product resuscitation.

Methods: Retrospective analysis of the Department of Defense Trauma Registry, 2008-2016, was performed. Multivariate logistic regression analyses of all adults presenting to NATO Role III facilities who required blood products were performed to identify factors associated with VET-guided resuscitation and mortality. A propensity score matched comparison of outcomes in patients treated at VET vs non-VET Role III facilities was performed. P values less than 0.05 were considered significant.

Results: 3320 patients predominately male (98%), median age range 25-29 years, ISS 18.8±0.2, with a penetrating injury (84%) were studied. Overall mortality was 9.7%. 594 patients had VET during their initial resuscitation. After adjusting for demographics, injury type/severity, vital signs, laboratory values, and hospital complications, VET during initial resuscitation was independently associated with decreased mortality in all patients (OR 0.63; p=0.04). Propensity analysis confirmed a VET-associated survival advantage with a 57% reduction in mortality (7.3% vs 13.1%; p=0.001) for all patients requiring blood products.

Conclusions: VET offers the ability for personalized, product-specific resuscitation within critically injured patients in combat trauma. Data from this NATO Role III experience suggest that routine VET use may be superior to non-VET guided resuscitation for combat trauma victims.

	Non-VET Guided Resuscitation	VET Guided Resuscitation	P value
Average ISS	19.7	19.3	0.582
Overall Mortality (%)	13.1	7.3	0.001
Large Volume Transfusion (4-9U/24hr) (%)	32.9	33.3	0.476
Massive Transfusion (>9U/24hr) (%)	29.3	46.9	0.000
Crystalloid Given in First 24hr (ml)	4062	2736	0.000
Whole Blood in First 24hr (U)	0.2	0.1	0.276
Packed Red Blood Cells in First 24hr (U)	8.1	11.6	0.000
Fresh Frozen Plasma in First 24hr (U)	7.0	11.8	0.000
Cryoprecipitate Given in First 24hr (U)	1.7	1.2	0.041
Platelets Given in First 24hr (U)	1.0	2.2	0.000
Total Blood Product in First 24hr (U)	18.0	26.9	0.000
Blood Loss at First Surgery (ml)	616.9	445.2	0.245
Trauma Induced Coagulopathy (%)	7.0	3.3	0.003
Patients with RBC:Plasma ≤1 (%)	55.8	81.1	0.000
Average RBC:Plasma	1.061	0.917	0.000

Table 1) Comparison of multiple resuscitation measures and outcomes for non-VET guided versus VET guided resuscitation.

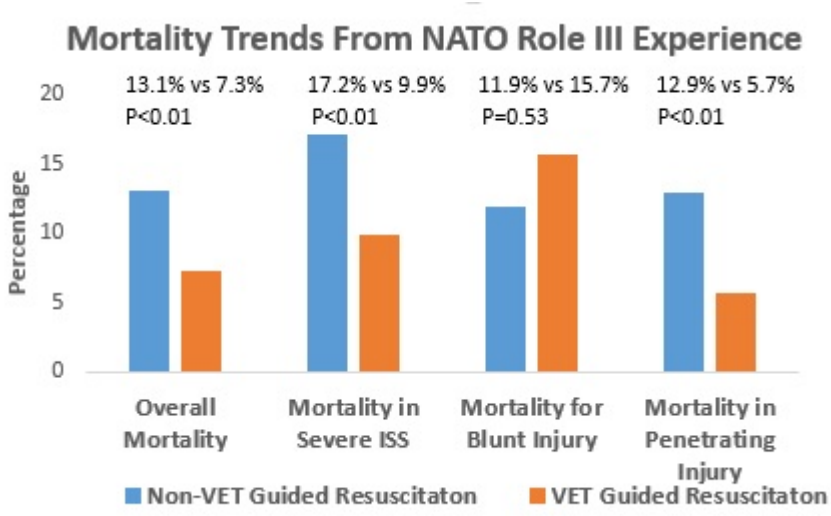


Figure 1) Mortality trends the NATO Role III experience overall and categorized into cohorts based on injury severity and mechanism.

Paper #3
January 15, 2020
1:10 pm

RIB FIXATION IN GERIATRIC TRAUMA: MORTALITY BENEFITS FOR THE MOST VULNERABLE PATIENTS

Roger C. Zhu, MD, Amory de Roulet, MD MPH*,
Chun-Cheng Chen, MD, PHD, Konstantin Khariton, DO*
New York Presbyterian-Queens

Presenter: Roger C. Zhu, MD

Discussant: Jennifer Knight Davis, MD, West Virginia University

Objectives: Using a national trauma registry, we assessed the impact of surgical stabilization of rib fractures (**SSRF**) in patients over the age of 65.

Methods: Using data from the 2016 Trauma Quality Improvement Program (TQIP) database, we identified patients =65 years of age admitted with multiple rib fractures and isolated chest wall injury. We developed a multivariate propensity score match to stratify patients that underwent rib fixation based on demographic, injury, and trauma center characteristics. We then compared outcomes including mortality, intensive care unit and hospital lengths of stay, tracheostomy, and pneumonia rates. We performed a subgroup analysis of patients receiving early (<48hrs) vs late SSRF.

Results: Of the 13,842 patients included in the study analysis, 278 (2.0%) underwent surgical rib fixation. (Table 1) Patients undergoing SSRF had higher rates of flail chest, earlier intubation, higher injury severity score, and increased intensive care unit (ICU) admission rates. The 1:1 propensity score match resulted in 220 patients in each group. The in-hospital mortality rate was significantly lower in the group that underwent surgical rib fixation (3.6% vs. 9.5%; p= 0.01). In the subgroup analysis of patients undergoing early fixation (n =75) vs late (n=203), we found that early fixation was associated with decreased rates of ventilator-associated pneumonia (VAP) (1.3% vs 7.9% p=0.04), shorter ICU lengths of stay (LOS) (6 vs 10 days p=0.001), and shorter hospital LOS (9 vs 15 days p=<0.0001). Our results also trended towards decreased mortality (2.7% vs 4.4%, p=0.50) and ventilator days (4 vs 7 days, p=0.10) in the early fixation group, however, these results did not reach statistical significance.

Conclusions: This study demonstrated a mortality benefit in geriatric trauma patients undergoing SSRF. Subgroup analysis demonstrated decreased VAP, ICU LOS, and hospital LOS in patients undergoing early SSRF.

	Pre-match					Post-match				
	No Fixation		Fixation		p-value	No Fixation		Fixation		p-value
Sample Size	13,564		278			220		220		
Gender (Male)	7,715	56.90%	191	68.70%	**<0.0001**	147	66.80%	144	65.50%	0.7628
Age	75	69-81	72	68-79	**<0.0001**	73	68 -79	72	68 - 79.5	0.472
Age Group										
<80	9,189	67.70%	210	75.50%	**0.0062**	173	78.60%	165	75.00%	0.3039
>= 80	4,375	32.30%	68	24.50%		47	21.40%	55	25.00%	
Race										
White	11,856	87.40%	258	92.80%	**0.0059**	204	92.70%	204	92.70%	0.9518
Black	587	4.30%	3	1.10%		2	0.90%	3	1.40%	
Asian Pacific	330	2.40%	4	1.40%		4	1.80%	3	1.40%	
Other	791	5.80%	13	4.70%		10	4.50%	10	4.50%	
ACS Level										
Level I	5,764	42.50%	136	48.90%	**0.0419**	107	48.60%	110	50.00%	0.9576
Level II	3,387	25.00%	70	25.20%		56	25.50%	54	24.50%	
Not Applicable	4,413	32.50%	72	25.90%		57	25.90%	56	25.50%	
Teaching Status										
Community	5,738	42.30%	128	46.00%	0.1109	102	46.40%	100	45.50%	0.9804
Non-Teaching	1,541	11.40%	21	7.60%		18	8.20%	18	8.20%	
University	6,285	46.30%	129	46.40%		100	45.50%	102	46.40%	
GCS										
GCS 9 -11	145	1.10%	5	1.80%	0.2448	4	1.80%	5	2.30%	0.7366
GCS 12-15	13,419	98.90%	273	98.20%		216	98.20%	215	97.70%	
SBP <90	279	2.10%	10	3.60%	0.0754	8	3.60%	7	3.20%	0.793
Intubated at Arrival in ED	72	0.50%	4	1.40%	**0.0425**	5	2.30%	3	1.40%	0.476
Injury Severity Score										
<15	9,370	69.10%	120	43.20%	**0.0001**	108	49.10%	109	49.50%	0.2823
15-24	3,755	27.70%	122	43.90%		96	43.60%	86	39.10%	
>25	439	3.20%	36	12.90%		16	7.30%	25	11.40%	
Maximum Non-Chest Trauma Severity Score										
0	3,341	24.60%	56	20.10%	**0.0051**	45	20.50%	47	21.40%	0.7266
1	2,231	16.40%	30	10.80%		35	15.90%	27	12.30%	
2	5,574	41.10%	138	49.60%		105	47.70%	107	48.60%	
3	2,418	17.80%	54	19.40%		35	15.90%	39	17.70%	
Chest Injury Severity Score										
3	12,818	94.50%	179	64.40%	**0.0001**	159	72.30%	157	71.40%	0.8892
4	613	4.50%	84	30.20%		53	24.10%	53	24.10%	
5	133	1.00%	15	5.40%		8	3.60%	10	4.50%	
Flail Chest	753	5.60%	134	48.20%	**0.0001**	77	35.00%	80	36.40%	0.7655
ED Disposition										
General Floor	4,768	35.20%	38	13.70%	**0.0001**	34	15.50%	35	15.90%	0.8751
Observation Unit	263	1.90%	2	0.70%		2	0.90%	2	0.90%	
Step Down	2,233	16.50%	35	12.60%		32	14.50%	31	14.10%	
SICU	5,663	41.80%	191	68.70%		144	65.50%	138	62.70%	
Operating Room	449	3.30%	16	5.80%		7	3.20%	12	5.50%	
Other	188	1.40%	2	0.70%		1	0.50%	2	0.90%	

Demographics and injury characteristics of geriatric patients with isolated chest wall injury pre and post propensity matching.

Paper #4
January 15, 2020
1:30 pm

IMPACT OF MARIJUANA ON VENOUS THROMBOEMBOLIC EVENTS: CANNABINOIDS CAUSE CLOTS IN TRAUMA PATIENTS

Jack Stupinski, MD, Kamil Hanna, MD, Michael Ditillo, DO, FACS*, Samer Asmar, MD, Lourdes Castanon, MD*, Lynn Gries, MD, Narong Kulvatunyou, MD*, Bellal Joseph, MD*
The University of Arizona

Presenter: Jack Stupinski, MD

Discussant: Walt Biffl, MD, Scripps Clinic

Objectives: Tetra-hydro-cannabinoids (THC) can modulate the coagulation cascade resulting in hypercoagulability. However, the clinical relevance of these findings has not been investigated. The aim of our study was to evaluate the impact of pre-injury marijuana exposure on thromboembolic complications in trauma patients.

Methods: We performed a 2-year (2015-2016) analysis of ACS-TQIP database and included all adult (=18y) trauma patients. Patients were stratified based on pre-injury exposure to Marijuana: THC +ve and THC -ve groups. We performed propensity score matching to control for confounding variables: demographics, comorbidities, injury parameters, hospital course, and thromboprophylaxis use. Outcomes were TEC [deep venous thrombosis (DVT), pulmonary embolism (PE), stroke, myocardial infarction (MI)] and mortality.

Results: Of 593,818 trauma patients, 678 patients were matched (THC +ve: 226 vs THC -ve: 452). Mean age was 35 +/- 14 years, ISS was 20[18-34]. There was no difference between the two groups regarding age (*p=0.24*), gender (*p=0.32*), ISS (*p=0.15*), spine-AIS (*p=0.28*), head-AIS (*p=0.41*), extremities-AIS (*p=0.16*), use of thromboprophylaxis (*p=0.18*) and hospital length of stay (*p=0.36*). Overall, the rate of thromboembolic complications was 5% and mortality was 4.1%. Patients in THC +ve group had higher rates of thromboembolic complications compared to those in THC -ve group (9.3% vs 2.8%, *p=0.01*). The rate of DVT (6.6% vs 1.8%, *p*=0.02) and PE (2.2% vs 0.2%, *p=0.04*) was higher in THC +ve group. However, there was no difference regarding the rate of stroke (*p=0.24*), MI (*p=0.35*) and mortality (*p=0.28*) (**Table1)**.

Conclusions: THC exposure increases the risk of thromboembolic complications in patients with trauma. Early identification and treatment for thromboembolic complications is required to improve outcomes in this high risk subset of trauma patients.

Outcomes	THC +ve (n=226)	THC –ve (n=452)	*P*-value
Thromboembolic Complications, % (n)	9.3% (21)	2.8% (13)	**0.01**
DVT	6.6% (15)	1.8% (8)	**0.02**
PE	2.2% (5)	0.2% (1)	**0.04**
Stroke	1.3% (3)	0.9% (4)	0.24
MI	0% (0)	0.2% (1)	0.35
Mortality	3.5% (8)	4.4% (20)	0.28

THC=Tetra-hydro-cannabinoids; DVT=Deep Vein Thrombosis; PE=Pulmonary Embolism; MI=Myocardial Infarction

Table 1: Outcomes

Paper #5
January 15, 2020
1:50 pm

HYPERTONIC SALINE RESUSCITATION IN TRAUMA FOLLOWING DAMAGE CONTROL LAPAROTOMY: DOES IT ATTENUATE INFLAMMATION

Patrick M. McCarthy, MD, Ryan Rhie, MD, Michelle Buehner, MD, Xiaoming Shi, MD, Christopher Corkins, MD, Kimberly Medellin, BSN, Nicole Shults, BS, James Aden, PhD, Allyson Arana, PhD, William Sanns, PhD, Joel Michalek, PhD, Valerie Sams, MD*
San Antonio Military Medical Center

Presenter: Patrick M. McCarthy, MD

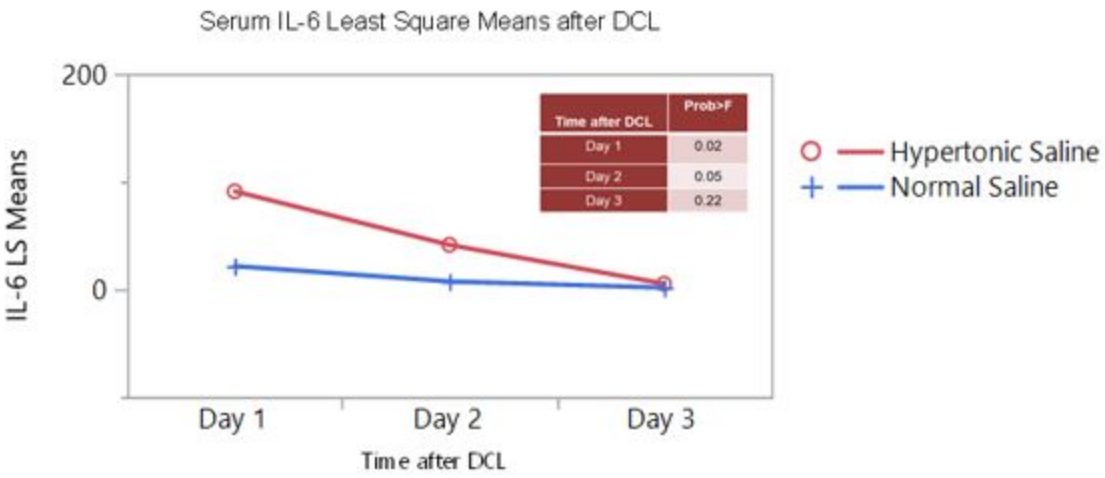
Discussant: Joseph Fernandez-Moure, MD, MS, Duke University Medical Center

Objectives: This study sought to determine if inflammatory cytokine levels were impacted by hypertonic saline solution (HTS) resuscitation in trauma patients undergoing damage control laparotomy (DCL).

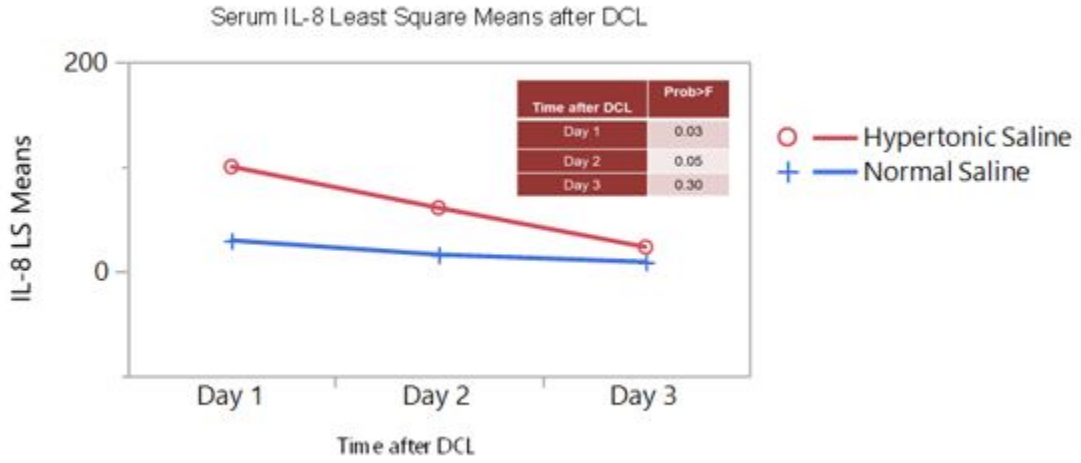
Methods: Trauma patients 18 years old or greater requiring a DCL were randomized to receive a standard rate of 3% HTS or 0.9% Normal Saline Solution (NSS) in this double blinded prospective trial. Demographics, laboratory values, IL6 and IL8 levels were compared. Statistical analysis was performed using JMP 13 (SAS, Cary, NC). Fisher's exact test, Mann-Whitney U-test, or Student's t-test were used as appropriate. Statistical significance was set at $p<0.05$.

Results: 70 patients met inclusion criteria of which 62 completed the protocol. The HTS and NSS groups were similar in age, sex, and body mass index ($p>0.05$). Groups had similar injury severity score (ISS), initial Glasgow Coma Scale (GCS), maximum Abbreviated Injury Score (AIS), Trauma Injury Severity Score (TRISS), and Revised Trauma Score (RTS). There were more penetrating traumas in the NSS cohort (64% vs. 36%), but no difference in organ laceration, orthopedic injuries, abdominal trauma, or significant vascular injuries. Mean base deficit and lactate were not significantly different ($p>0.05$). The geometric means of IL6 and of IL8 concentrations were significantly higher in the HTS group compared to the NSS group in the first 72 hours ($p=0.033$, $p=0.047$, respectively).

Conclusions: This is the largest known human study to date investigating impact of HTS resuscitation in trauma on inflammatory cytokines. Our results found an increase in inflammatory markers with the HTS cohort that does not support previously published studies. This analysis is part of a larger multicenter trial investigating infection rates and organ dysfunction and may necessitate larger studies investigating the effects of inflammatory cytokine levels on trauma patient outcomes.



Comparison of the geometric means of IL-6 concentrations between normal saline and 3% hypertonic saline in the days after damage control laparotomy



Comparison of the geometric means of IL-8 concentrations between normal saline and 3% hypertonic saline in the days after damage control laparotomy

Paper #6
January 15, 2020
2:30 pm

SAVE IT – DON'T WASTE IT! MAXIMIZING UTILIZATION OF ERYTHROCYTES FROM PREVIOUSLY STORED WHOLE BLOOD

Kasiemobi Pulliam, MD, Bernadin Joseph, BS, Rosalie Veile, BS, Amy Makley, MD*, Michael Goodman, MD*, Timothy A. Pritts, MD, PhD*
University of Cincinnati

Presenter: Kasiemobi Pulliam, MD

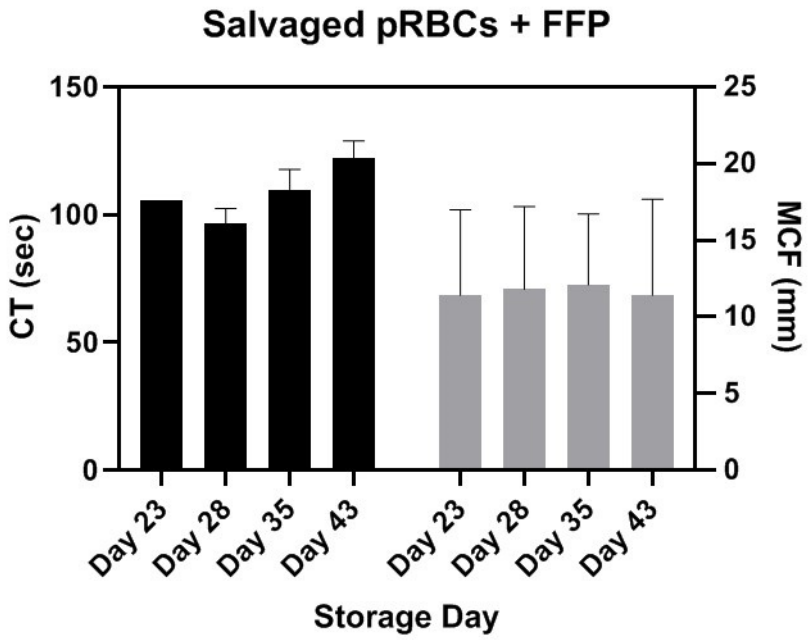
Discussant: John R. Taylor, III, MD, University of Arkansas for Medical Sciences

Objectives: Recent military and civilian experience suggests that fresh whole blood (WB) may be the preferred initial management of hemorrhagic shock, but its use is limited by its 21-day shelf life. The viability, red blood cell storage lesion, and coagulation status of packed red blood cells (pRBCs) salvaged from expired WB are unknown. We hypothesized that packed red blood cells can be salvaged from previously stored WB.

Methods: Cold stored, low-titer, O-positive, non-leukoreduced, WB units were obtained at 21 days. These units underwent centrifugation and erythrocytes were resuspended in AS-3 and stored for 21 additional days (salvaged pRBCs). The red blood cell storage lesion parameters of microvesicles, band-3, free hemoglobin, annexin V, advanced oxidation protein products (AOPP), and erythrocyte osmotic fragility were measured weekly and compared to pRBCs prepared at the time of donation and stored in AS-3 for 42 days (standard pRBCs). Viscoelastic coagulation parameters were analyzed by thromboelastometry to determine innate coagulability in an *in vitro* 1:1 ratio with plasma.

Results: There were no significant differences in microvesicle (585.2+181.4 vs. 700.2.2+317.2 events/μL), cell-free hemoglobin (59.4+13.8 vs. 67.6+17.4 g/dL), and annexin V content (20.8+3.7 vs. 32.2+2.1 %) for salvaged vs. standard pRBCs. The salvaged pRBCs had a significant reduction in AOPP (567.3+8.2 vs. 232.0+4.4 μM) but reduced Band-3 (98.3+1.4 vs. 68.4+6.7 %) and greater osmotic fragility. Salvaged pRBCs maintained consistent clotting time, clot formation time, and maximum clot formation as they aged.

Conclusions: Salvaged pRBCs from previously stored whole blood accumulate the red blood cell storage lesion in a similar fashion to standard pRBCs and maintain consistent coagulability when reconstituted with plasma. Salvaged pRBCs may be a viable product for potential utilization in the treatment of traumatic hemorrhagic shock.



Salvaged pRBCs maintained consistent clotting time, clot formation time, and maximum clot formation as they aged.

Paper #7
January 15, 2020
2:50 pm

DOXYCYCLINE IMPROVES TRAUMATIC BRAIN INJURY OUTCOMES IN MURINE MODEL

Adil J. Malek, MD, Bobby Robinson, MD, Angie Hitt, RN,
Courtney Shaver, MS, Claire Isbell, MD, MSCI*
Scott and White Memorial Hospital

Presenter: Adil J. Malek, MD

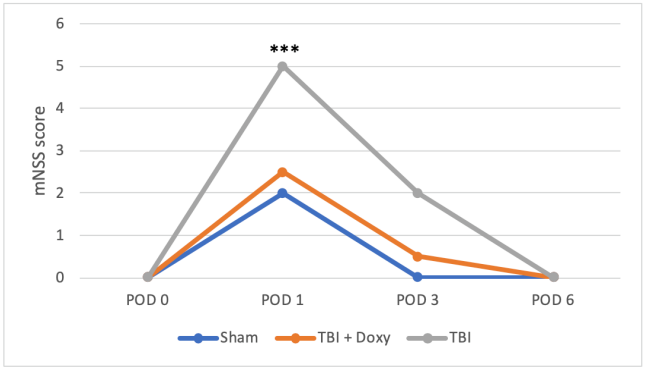
Discussant: Jose L. Pascual, MD, PhD, Penn Presbyterian Medical Center

Objectives: Cerebral edema after traumatic brain injury (TBI) leads to secondary brain ischemia, herniation, and brain death. The underlying pathophysiology responsible for TBI-induced microvascular "leak" is by loss of the blood-brain barrier (BBB) integrity via the proteolytic enzyme matrix metalloproteinase-9 (MMP-9). Administration of doxycycline has demonstrated preservation of BBB integrity by inhibition of MMP-9 in prior *in vitro* and non-survival murine studies. We sought to determine the effect of doxycycline administration on behavioral and motor function after inducing TBI in a murine survival model.

Methods: Adult C57BL/6 mice underwent sham versus TBI with or without doxycycline treatment. TBI was induced using a controlled cortical impactor. The TBI with doxycycline cohort received a dose of doxycycline (20mg/kg) one hour after injury and every 12 hours until postoperative day (POD) 6. All mice underwent preoperative modified neurological severity score (mNSS) testing, wire grip testing, and weighing. Postoperative mNSS, wire grip, weight, and ataxia analysis (Digigait) was performed on POD 1, 3, and 6. Non-parametric testing was used for comparative analysis.

Results: 15 sham mice, 15 TBI mice, and 10 TBI with doxycycline mice were studied. Mice treated with doxycycline had significantly improved mNSS and wire grip scores by POD 1 ($p<0.05$, Figure 1). Mice treated with doxycycline had significantly improved ataxia scores by POD 6 ($p=0.0006$, Figure 2). There was no significant difference in rate of weight change between the three groups.

Conclusions: Mice treated with doxycycline following TBI had improved behavioral and motor function that approached or exceeded those of sham mice. This study demonstrates the important role of doxycycline in preserving BBB integrity following TBI in a murine model. Further studies exploring the role of doxycycline in adult TBI are warranted.



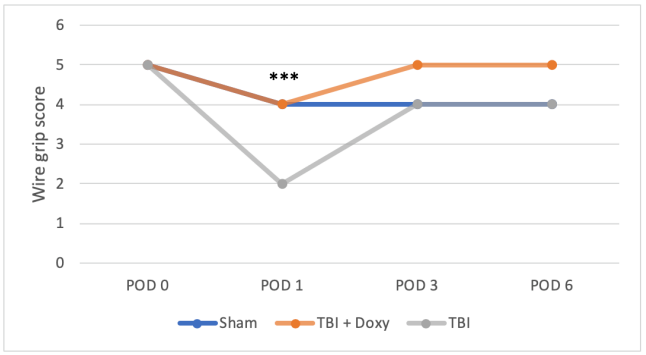


Figure 1: Comparison of postoperative behavioral testing outcomes
Lower mNSS scores and *higher* wire grip scores indicate improved function. TBI + Doxy mice trend closer to sham mice than mice with TBI alone.
Abbreviations: POD-postoperative day; TBI-traumatic brain injury; mNSS-modified neurological severity score; Doxy-doxycycline
****:* Denotes p<0.05

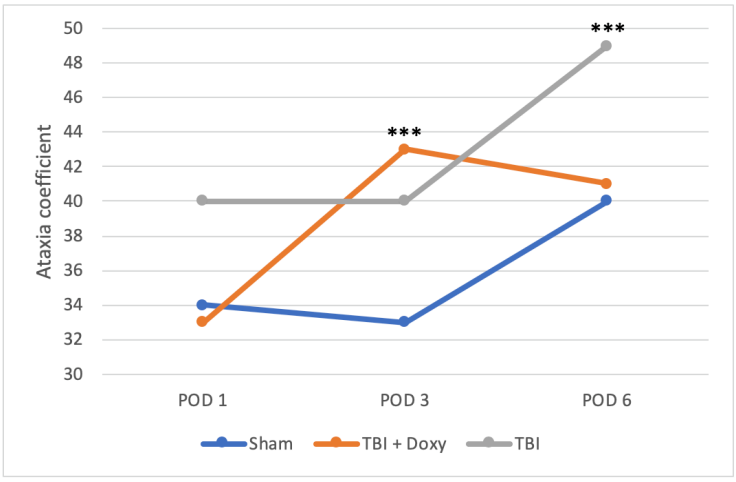


Figure 2: Comparison of postoperative gait analysis utilizing Digigait
Higher ataxia coefficients indicate more severe ataxia.
Abbreviations: POD-postoperative day; TBI-traumatic brain injury
****:* Denotes p<0.05

Paper #8
January 15, 2020
3:10 pm

VALIDATION OF A NOVEL PARTIAL REBOA DEVICE IN A SWINE HEMORRHAGIC SHOCK MODEL: FINE TUNING FLOW TO OPTIMIZE BLEEDING CONTROL AND REPERFUSION INJURY

Dominic M. Forte, MD, Woo S. Do, MD, Jessica Weiss, MD, Rowan Sheldon, MD, John P. Kuckelman, DO, Matthew J. Eckert, MD*, Matthew J. Martin, MD, FACS*
Madigan Army Medical Center

Presenter: Dominic M. Forte, MD

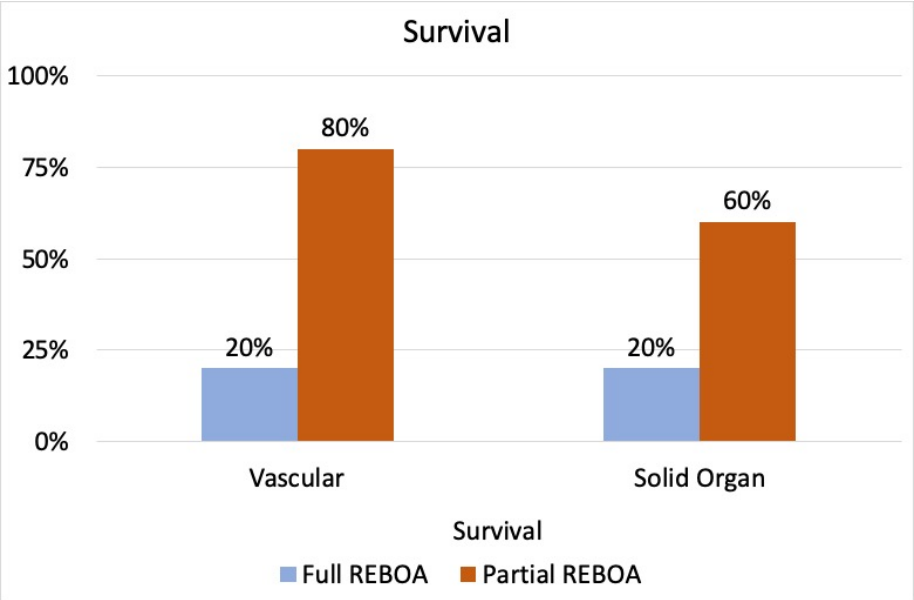
Discussant: Letitia Bible, MD, Banner Health

Objectives: Partial restoration of aortic flow during REBOA is advocated by some to mitigate distal ischemia, but current devices cannot effectively control partial flow. Our lab has validated the mechanics and optimal partial REBOA flow rates using a prototype device (pREBOA). We sought to test this novel technology against full REBOA (fREBOA) in hemorrhagic shock conditions.

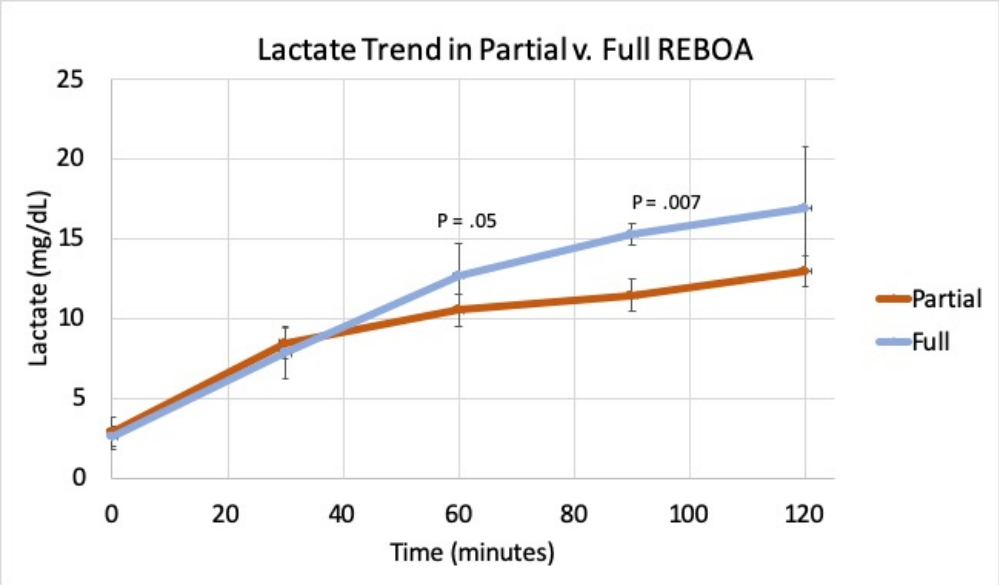
Methods: 20 Yorkshire swine underwent placement of aortic flow probes, zone 1 REBOA placement, and 20% blood volume hemorrhage. They were then randomized to either solid organ (SOI) or abdominal vascular (AVI) injury. The pREBOA arm (10 swine) underwent full inflation for 10min, then deflation to a flow rate of (0.5L/min) for 2hr. The fREOBA arm (10 swine) underwent full inflation for 60min, followed by deflation/resuscitation.

Results: There was no significant difference in cardiac output (CO), wedge pressures, or systemic vascular resistance between pREBOA and fREBOA arms except for CO at 30min (pREBOA 2.1, fREBOA 2.3, p=.03). Hemorrhage was higher in the fREBOA group as measured by intra-abdominal clot weight at conclusion of the experiment (1.1kg v. 0.8kg, p=.02). 60% of SOI and 80% of the AVI animals survived to completion of experiment in the pREBOA arm vs 20% SOI and 20% AVI animals in the fREBOA arm (Figure 1). Serum lactate was higher in the fREBOA arm at 60 and 90min (13 v 10, and 15 v 11, both $p<.05$, Figure 2). The pREBOA swine were further assessed by survival. Surviving animals had higher calcium at 30 (8.6 v 7.5, p=.02 at 30min, 8.6 v 7.2 at 60min, p=.07) and a trend towards lower potassium.

Conclusions: Prolonged pREBOA at a moderate distal flow rate provided hemorrhage control, improved survival, and decreased ischemic injury versus fREBOA with prolonged use. Prophylactic aggressive calcium supplementation may be routinely warranted prior to and during the reperfusion phase.



Survival with Full v Partial REBOA



Lactate Trends in Partial v Full REBOA

Paper #9
January 15, 2020
3:50 pm

INJURY AND SHOCK DRIVEN EFFECTS ON PLATELET AGGREGOMETRY: A CAUTIONARY TALE OF PHENOTYPING

Nichole E. Starr, MD, MPH, Zachary Matthay, MD, Matthew E. Kutcher, MD*, Alexander Fields, PhD, Brenda Nunez-Garcia, BA, Rachael A. Callcut, MD, MSPH, FACS*, Mitchell J. Cohen, MD, FACS, Lucy Z. Kornblith, MD*
University of California San Francisco

Presenter: Nichole E. Starr, MD, MPH

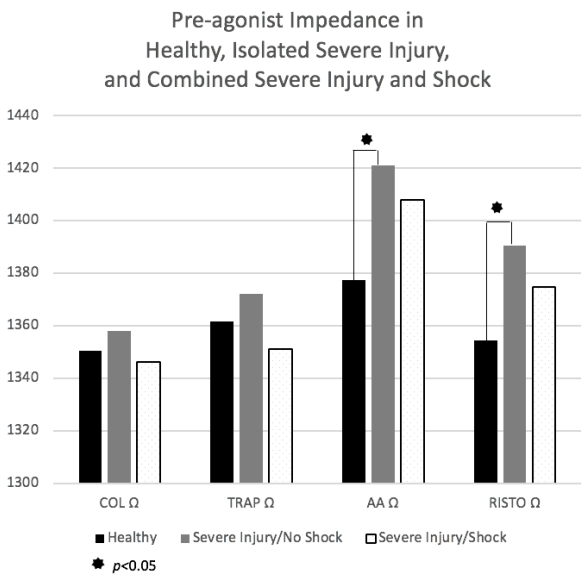
Discussant: Niels Martin, MD, University of Pennsylvania

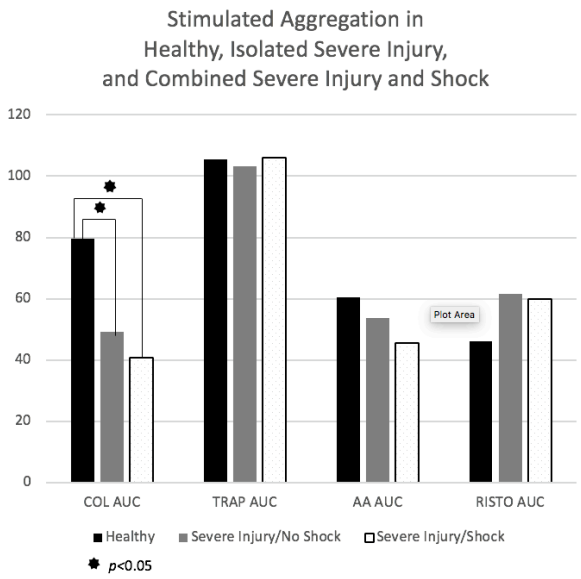
Objectives: Platelet behavior in trauma-induced coagulopathy (TIC) is poorly understood. Injured patients show impaired platelet aggregation ("dysfunction") to *in vitro* agonist stimulation assessed by impedance aggregometry (*PA*). However, *PA* detects only the response of unstimulated platelets capable of responding to agonists. We hypothesize that severe injury itself stimulates platelets, curtailing their ability to respond to agonism, and thus over-identifies platelet "dysfunction" by *PA.*

Methods: Blood from 227 pre-resuscitation trauma patients and 27 healthy donors was collected for *PA*. Pre-agonist impedance(O) and platelet aggregation(area under the curve [AUC]) in response to collagen(COL), thrombin receptor-activating peptide-6(TRAP), arachidonic acid(AA), and ristocetin(RISTO) were measured. The effects of severe injury(ISS>25) and shock(base excess<-6) on pre-agonist impedance and stimulated platelet aggregation were assessed by stratification and multivariable regression.

Results: The patients had a median ISS of 21, with 23% in shock. Isolated severe injury was associated with a "functional" platelet phenotype: elevated pre-agonist impedance (AA and RISTO, $p<0.01$;PanelA), yet impaired aggregation to COL ($p<0.01$;PanelB). Combined injury/shock was associated with a "dysfunctional" phenotype: no significant effect on pre-agonist impedance, but similar impaired aggregation responses (COL, $p<0.01$). Isolated severe injury was associated with adjusted increases in pre-agonist impedance (COL21O, $p=0.03$), not seen in combined injury/shock (all $p>0.05$).

Conclusions: Injury and shock confer differential patterns of platelet aggregation and are required in combination to drive platelet "dysfunction." This supports that combined tissue injury and shock are necessary to induce coagulopathic responses and is consequential in improving phenotyping of post-injury platelet behavior and for guiding platelet-based therapeutics.


Pre-agonist Impedance in
Healthy, Isolated Severe Injury,
and Combined Severe Injury and Shock
1440
1420
1400
1380
1360
1340
1320
1300
COL Ω
TRAP Ω
AA Ω
RISTO Ω
Healthy
Severe Injury/No Shock
Severe Injury/Shock
p<0.05


Stimulated Aggregation in
Healthy, Isolated Severe Injury,
and Combined Severe Injury and Shock
120
100
80
60
40
20
0
Plot Area
COL AUC
TRAP AUC
AA AUC
RISTO AUC
Healthy
Severe Injury/No Shock
Severe Injury/Shock
p<0.05

Paper #10
January 15, 2020
4:10 pm

ACTIN IS ASSOCIATED WITH TISSUE INJURY IN TRAUMA PATIENTS AND PRODUCES A HYPERCOAGULABLE PROFILE IN VITRO

Julia R. Coleman, MD, MPH, Ernest Eugene Moore, MD*, Kalev Freeman, MD,
Christopher Silliman, MD, PhD, Mitchell J. Cohen, MD, FACS,
Angela Sauaia, MD, PhD, Jason Samuels, MD, Kirk Hansen, PhD
University of Colorado, Aurora

Presenter: Julia R. Coleman, MD, MPH

Discussant: Vanessa Nomellini, MD, PhD, University of Cincinnati

Objectives: While tissue injury provokes fibrinolysis shutdown in trauma, the mechanism remains elusive. Cellular death causes release of structural proteins, specifically cytoskeletal and skeletal muscle actin and myosin, which may interact with clot formation and structure. We hypothesize that tissue injury is associated with high circulating actin and that actin produces a hypercoagulable profile *in vitro.*

Methods: First, blood was collected from trauma activation patients at a single level-1 trauma center. Proteomic analyses were performed through targeted liquid-chromatography coupled with mass-spectrometry using isotope labeled standards for quantification. Second, we added physiologic concentrations of actin to whole blood from healthy volunteers and analyzed changes in coagulation by thrombelastography, as well as to plasma of healthy volunteers and examined clot architecture via confocal microscopy of fluorescent fibrinogen.

Results: Overall, 108 trauma patients were included: majority(71%) male, median age 32.7, 66% blunt mechanism, median new injury severity score(NISS) of 41. Compared to patients without severe tissue injury(NISS<15, n=10), patients with severe tissue injury(NISS>15, n=98) had higher levels of circulating actin:gelsolin (0.2355 vs 0.1539, p=0.02). Overall, 10 healthy volunteers were included in the *in vitro* experiments (50% male, median age 31.3). Actin significantly increased angle(40.0^{o} to 52.9^{o}, p=0.002) and decreased fibrinolysis(LY30 of 4.0% to 1.6%, p=0.002), provoking fibrinolytic shutdown in three patients(Table 1, Figure 1). Additionally, actin impacted fibrin thickness and fibrin cross-linking.

Conclusions: Actin increases clot propagation and provokes fibrinolysis shutdown *in vitro*, and high circulating levels of actin are present in patients with severe tissue injury, suggesting release of actin in the setting of tissue injury contributes to fibrinolysis shutdown.

Figure 1. Citrated native thrombelastography tracing in absence (green) and presence (white) of actin.

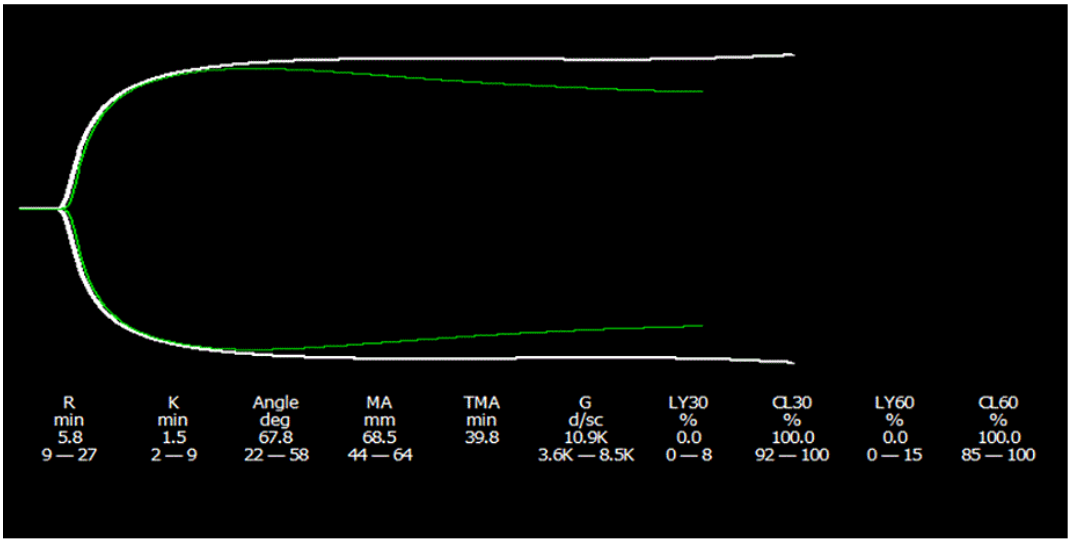


Table 1. Changes in thrombelastography in the presence of actin, presented as median and interquartile ranges (IQR).

	Whole blood	Whole blood + actin	p value
R (min)	8.3 (8.0-10.1)	7.6 (5.7-9.6)	0.22
Angle (o)	40.0 (37.0-49.0)	52.9 (42.4-61.0)	0.002
MA (mm)	63.5 (60.4-67.5)	63.5 (53.0-69.1)	0.52
LY30 (%)	4.0 (3.2-7.0)	1.6 (0.2-3.7)	0.002

R=reaction time, MA=maximum amplitude, LY30=fibrinolysis 30 minutes after MA

Paper #11
January 16, 2020
1:45 pm

COLORECTAL RESECTION IN EGS: AN EAST MCT

Brittany Aicher, MD*, Alejandro Betancourt-Ramirez, MD, FACS*, Michael D. Grossman, MD*, Holly Heise, MSN, Thomas J. Schroeppel, MD*, Matthew C. Hernandez, MD, Martin D. Zielinski, MD, FACS*, Napaporn Kongkaewpaisan, MD, Haytham Kaafarani, MD, MPH*, Afton Wagner, Daniel J. Grabo, MD, FACS*, Michael T. Scott, MD, Gregory L. Peck, DO*, Gloria Chang, Kazuhide Matsushima, MD*, Laura M. Cullinane, Daniel C. Cullinane, MD*, Benjamin W. Stocker, BS, Joseph Posluszny, MD*, Ursula J. Simonoski, BS, Richard D. Catalano, MD*, Georgia Vasileiou, D. Dante Yeh, MD, FACS, FCCM*, Vaidehi Agrawal, PhD, Michael Truitt, MD*, MaryAnne Pickett, MD, Linda Dultz, MD, MPH*, Alison Muller, Adrian W. Ong, MD*, Janika L. San Roman, MPH, Oliver Fackelmayer, MD, Catherine Velopulos, MD, MHS, FACS*, Cheralyn Hendrix, MD, Jordan Estroff, MD*, Sahil Gambhir, Kokila Jeyamurugan, Nikolay Bugaev, MD*, Victor Portillo, MD, FACS*, Matthew M. Carrick, MD*, Lindsay O'Meara, CRNP*, Joseph A. Kufera, MA, Brandon R. Bruns, MD, FACS*
University of Maryland

Presenter: Brittany Aicher, MD

Discussant: Amy Rushing, MD, Ohio State University

Objectives: Evidence for stoma (STM) or anastomosis (ANST) after urgent/emergent colorectal resection is limited. This study examined outcomes after colorectal resection in emergency general surgery patients.

Methods: This was an EAST-sponsored prospective observational multicenter study of patients undergoing urgent/emergent colorectal resection. 21 centers enrolled patients over 11-months. Preoperative, intraoperative and postoperative variables were recorded. Chi-square, Mann-Whitney U-test, and multivariable logistic regression models were used to describe outcomes and risk factors for surgical complication or mortality.

Results: 439 patients were enrolled (184 ANST, 255 STM). Median (IQR) age was 62 (53-71), median Charlson Comorbidity Index (CCI) was 4 (1-6). The most common indication for surgery was diverticulitis (28%). STM group was older, had a higher CCI and more likely to be immunosuppressed. Preoperatively STM patients were more likely to be intubated, on vasopressors, have pneumoperitoneum, leukocytosis or elevated lactate. Overall mortality was 13%, which was higher in STM patients (18 vs. 8%, p=0.02). 35% of STM patients developed a surgical complication vs. 25% of ANST patients (p=0.02) (Table 1). On multivariable analysis, management with an open abdomen, intraoperative blood transfusion and larger hospital size were associated with development of a surgical complication while CCI, preoperative vasopressor use, steroid use, open abdomen and intraoperative blood transfusion were independently associated with mortality (Table 2).

Conclusions: This study highlights a tendency to perform fecal diversion in patients that are acutely ill at presentation. The morbidity/mortality rate is higher in STM patients. Independent predictors of mortality include CCI, preoperative vasopressor use, steroid use, open abdomen and intraoperative blood transfusion. Following adjustment by clinical factors, method of colon management was not associated with surgical complication or mortality.

Table 1: Preoperative, intraoperative, and postoperative patient variables.

	All 439	Anastomosis[1] 184 (41.9)	Stoma[2] 255 (58.1)	*p* value*
Demographics, comorbidities				
Female sex	**210 (47.8))**	80 (43.5)	130 (51.0)	0.12
Age, y†	**62 (53-71)**	58 (46-69)	64 (56-73)	**<0.001‡**
Charlson Comorbidity Index				
0	**60 (13.7)**	39 (21.2)	21 (8.2)	
1	**53 (12.1)**	28 (15.2)	25 (9.8)	
2	**64 (14.6)**	32 (17.4)	32 (12.5)	
3	**36 (8.2)**	13 (7.1)	23 (9.0)	
4	**68 (15.5)**	17 (9.2)	51 (20.0)	
5 or more	**158 (36.0)**	55 (29.9)	103 (40.4)	**<0.001**
Steroids	**51 (11.6)**	10 (5.4)	41 (16.1)	**<0.001**
Other immunosuppressant	**25 (5.7)**	4 (2.2)	21 (8.2)	**0.007**
Preoperative exam and laboratory value				
Continuous vasopressor infusion	**74 (16.9)**	13 (7.1)	61 (23.9)	**<0.001**
Intubated	**72 (16.4)**	15 (8.2)	57 (22.4)	**<0.001**
Pneumoperitoneum	**172 (39.2)**	41 (22.3)	131 (51.4)	**<0.001**
Lactate >1.5 (n=131,214)	**216 (62.6)**	67 (51.2)	149 (69.6)	**<0.001**
Hgb, g/dL† (n=184,254)	**12.3 (10.0-14.2)**	12.8 (10.9-14.7)	11.9 (9.5-14.0)	**0.002‡**
WBC count, /μL† (n=184,254)	**12.4 (8.8-18.1)**	11.9 (9.0-17.0)	13.1 (8.4-18.7)	0.37‡
Surgical complications				
Surgical site infection				
Superficial	**34 (7.7)**	18 (9.8)	16 (6.3)	0.17
Deep	**17 (3.9)**	5 (2.7)	12 (4.7)	0.29
Organ	**62 (14.1)**	13 (7.1)	49 (19.2)	**<0.001**
Anastomotic dehiscence	**28 (6.4)**	21 (11.4)	7 (2.7)	**<0.001**
Enterocutanous or atmospheric fistula	**8 (1.8)**	5 (2.7)	3 (1.2)	0.29
Bowel obstruction requiring surgery	**1 (0.2)**	0 (0.0)	1 (0.4)	1.00
Stoma complication requiring surgery	**16 (3.6)**	0 (0.0)	16 (6.3)	**<0.001**
Fascial dehiscence	**22 (5.0)**	6 (3.3)	16 (6.3)	0.16
≥1 of the above complications	**133 (30.3)**	45 (24.5)	88 (34.5)	**0.02**
Need for unplanned intervention for above complication	**97 (22.1)**	30 (16.3)	67 (26.3)	**0.01**
Surgical	**41 (9.3)**	17 (9.2)	24 (9.4)	0.71
Percutaneous drain	**22 (5.0)**	2 (1.1)	20 (7.8)	**0.001**
Surgical and percutaneous drain	**34 (7.7)**	11 (6.0)	23 (9.0)	0.24
Discharge				
Hospital length of stay	**13 (8-22)**	10 (6-16)	15 (10-25)	**<0.001‡**
Deceased	**59 (13.4)**	14 (7.6)	45 (17.6)	**<0.001**

[1] Anastomosis: bowel resection with primary anastomosis; [2] Stoma: bowel resection with an end ostomy
Data presented as n (%), unless otherwise indicated. (n=x,y), indicates the number of variables available for analysis in each group if other than 184, 255. NSAID, non-steroidal anti-inflammatory drug; Other immunosuppressant includes tacrolimus, methotrexate, highly-active antiretroviral therapy, azathioprine, mycophenolic acid, keflunomide, hydroxychloroquine, and azathioprine; bpm, beats per minute; Cr, creatinine; Hgb, hemoglobin; WBC, white blood cell. * χ2 tests were used unless otherwise indicated. † Values are median (IQR). ‡ Mann-Whitney U test.

Table 2: Multivariable logistic regression model for at least one surgical complication and mortality in patients undergoing urgent or emergent colorectal resection

	At least one surgical complication*			**Mortality**		
	Odds Ratio	95% CI	*P* value	Odds Ratio	95% CI	*P* value
Stoma (vs. anastomosis)	1.28	0.79-2.08	0.32	1.42	0.67-3.03	0.36
CCI	0.97	0.88-1.08	0.62	1.46	1.06-2.02	**0.02**
Preoperative vasopressor	1.22	0.62-2.41	0.57	3.07	1.35-6.97	**0.007**
Preoperative respiratory failure	0.64	0.31-1.31	0.22	1.32	0.54-3.20	0.54
Pneumoperitoneum	1.25	0.77-2.03	0.36	0.66	0.32-1.34	0.25
Open abdomen	2.07	1.24-3.46	**0.006**	2.62	1.30-5.29	**0.007**
Steroid use	0.77	0.39-1.51	0.44	3.02	1.26-7.20	**0.01**
Intraoperative PRBC transfusion	2.03	1.20-3.42	**0.008**	2.29	1.17-4.47	**0.02**
Diverticulitis	1.40	0.82-2.41	0.22	0.42	0.15-1.18	0.10
Hospital size	1.82	1.11-2.96	**0.02**	0.60	0.28-1.25	0.17

* Surgical complications include: surgical site infection, anastomotic dehiscence, enterocutaneous or atomospheric fistula, bowel obstruction requiring surgery, stoma complication requiring surgery, and fascial dehiscence.
CI: confidence interval, CCI: Charlson comorbidity index, PRBC: packed red blood cell
Hosmer-Lemeshow test: Complication - $\chi2 = 7.29$, $df = 8$, $p = 0.51$; Mortality - $\chi2 = 6.53$, $df = 8$, $p = 0.59$

Paper #12
January 16, 2020
2:05 pm

TEMPORARY INTRAVASCULAR SHUNTS AFTER CIVILIAN ARTERIAL INJURY: A PROSPECTIVE, MULTICENTER EAST STUDY

Lily Tung, MD*, Jennifer Leonard, MD, PhD*, Ryan A. Lawless, MD*, Alexis Cralley, MD, Richard Betzold, MD*, Jason D. Pasley, DO, FACS*, Kenji Inaba, MD, Jennie S. Kim, MD, Dennis Y. Kim, MD, FRCSC, FACS, FCCP*, Kwang Kim, Brad Dennis, MD, FACS*, Michael C. Smith, MD*, Margaret Moore, MD*, Christina Tran, Joshua P. Hazelton, DO, FACS*, Atlee Melillo, MD, Tejal S. Brahmbhatt, MD, FACS*, Stephanie Talutis, MD, MPH, Noelle Saillant, MD*, Jae Moo Lee, BS, Mark J. Seamon, MD, FACS*
University of Pennsylvania

Presenter: Lily Tung, MD

Discussant: David Skarupa, MD, UFCOM & UF Health Jacksonville

Objectives: Prior civilian temporary intravascular shunt (TIVS) reports have provided limited, conflicting, retrospective data regarding the shunt dwell time (SDT) and shunt outcomes relationship. We sought to definitively determine the impact of SDT on shunt related outcomes after major arterial injuries.

Methods: A prospective, multicenter study (11 centers) of trauma patients undergoing TIVS following arterial injury was undertaken (2017-2019). Exclusion criteria included age <15yrs, TIVS distal to popliteal/brachial arteries and death before TIVS removal. Clinical variables and outcomes were compared by SDT. The primary endpoint was TIVS complications (thrombosis, migration, distal ischemia). Power analysis based on our prior retrospective data (=6hrs SDT 0% vs >6hrs SDT 30% shunt complications) demonstrated 56 study patients yields 90% power (p=0.05).

Results: The 67 patients who underwent TIVS were primarily young (med[IQR] 30[22-36] yrs), males (85%), severely injured (ISS 19[10-25]) by penetrating means (60%) and had Argyle (58%) TIVS for extremity (82%) injuries. Compared by SDT (=6hrs [n=42] vs >6hrs [n=25]), there were no differences in age, mechanism, injury location, tourniquet use, extremity AIS, MESS, fractures or surgeon specialty between groups (all p>0.05). >6hrs (900[600-1440] min) TIVS patients had more severe injuries (ISS 25 vs 14, SBP 102 vs 129, GCS 10 vs 15, associated vein 76% vs 36%; all p<0.05) and more frequent shunt complication predictors (**Table**) than =6hrs (120[57-181] min) patients, yet prolonged SDT did *not* correlate with TIVS complications (**Figure**). Shunt complication patients (9%) were discharged home less often (33% vs 64%; p=0.003) but all survived.

Conclusions: Prolonged SDT did not lead to shunt complications in this prospective, multicenter study. Our results suggest that SDT should be determined by overall clinical condition rather than concern for shunt complications.

Table: Clinical Variables Typically Associated with TIVS Complications

	SDT ≤6hrs (n=42)	SDT >6hrs (n=25)	*p* value
Shunt size (Fr)	9 (8-12)	12 (10-14)	<0.001
Hypotension during SDT	5%	48%	<0.001
Vasopressors during SDT	21%	60%	0.003
CPR during SDT	7%	20%	0.138
Compartment syndrome during SDT	10%	8%	1.00
Anticoagulation during SDT	55%	16%	0.002

TIVS = temporary intravascular shunts; SDT = shunt dwell time; median (IQR)

Table: Clinical Variables Typically Associated with TIVS Complications

Figure: Shunt Complications in Relation to Shunt Dwell Time

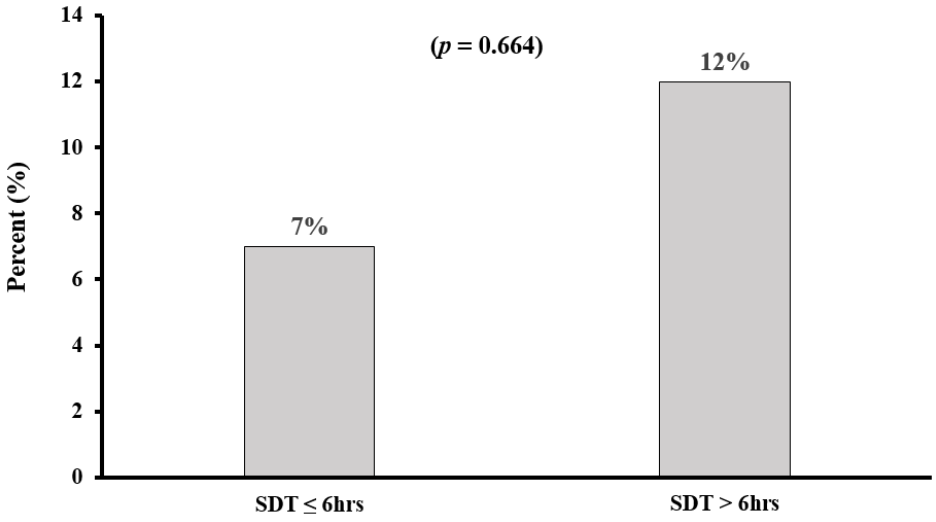


Figure: Shunt Complications in Relation to Shunt Dwell Time

Paper #13
January 16, 2020
2:25 pm

ASSOCIATION OF TXA WITH VENOUS THROMBOEMBOLISM IN BLEEDING TRAUMA PATIENTS: AN EAST MULTICENTER STUDY

Lisbi Rivas, MD*, Babak Sarani, MD, FACS, FCCM*, Jordan Estroff, MD*, Andrew Sparks, MS, Kristen Carter, MD, Matthew E. Kutcher, MD*, Areg Grigorian, MD, Jeffry Nahmias, MD, MHPE, FACS*, Spencer Albertson, Juan Quispe, MD, Xian Luo-Owen, PhD, David Turay, MD, PhD*, Michael Vella, MD*, Gabriella Tortorello, MD, Jose L. Pascual, MD, PhD, FRCS(C), FACS, FCCM*, McKell Quattrone, BS, Andrew C. Bernard, MD, FACS*, Alice Lee, DO, Danielle Tamburrini, DO, Asanthi Ratnasekera, DO, FACOS*, Kelly Harrell, BS, Carlos J. Rodriguez, DO, MBA, FACS*, Kokila Jeyamurugan, Nikolay Bugaev, MD*, Jason Weinberger, DO*, Anne Warner, MD*, Joshua P. Hazelton, DO, FACS*, Miriam Selevany, BS, Janika L. San Roman, MPH, Franklin Lee Wright, MD*, Shane Urban, RN, Alexandra Kovar, MD, Amy Hamrick, MSN, Michael G. Mount, DO*, Matthew M. Carrick, MD*, Daniel C. Cullinane, MD*, Grace Chang, MD*, Gary Jain, MD, M. Chance Spalding, DO, PhD*
George Washington University

Presenter: Lisbi Rivas, MD

Discussant: Mark Hoofnagle, MD, PhD, Washington University School of Medicine

Objectives: Tranexamic acid (TXA) is an anti-fibrinolytic agent that lowers mortality in bleeding trauma patients. There are conflicting results reported regarding the association between TXA administration for hemorrhagic shock and subsequent venous thromboembolism (VTE). We hypothesized that TXA is not associated with VTE.

Methods: A retrospective study was performed in 15 hospitals. Inclusion criteria were: age>18 years old and need for>5 units of blood (PRBC) within 24 hours of injury. Exclusion criteria included: death within 24 hours, pregnancy, interfacility transfer, pre-injury use of anticoagulants, TXA administration>3 hours after injury, and asymptomatic duplex VTE surveillance. Patients were divided into 2 cohorts based on receiving TXA. Incidence of VTE was the primary outcome. Secondary outcomes included myocardial infarction (MI), stroke (CVA), length of stay (LOS), and death. Univariate analysis was performed using Chi-Square, Fisher's exact test, independent samples t-test, and Mann-Whitney U test. Resulting comparisons with $P<0.2$ were entered into a multivariable model. A power analysis using expected VTE rates found that 830 patients were needed.

Results: 1,333 patients were enrolled; 887 (67%) received TXA. Patients who received TXA were more likely to be female, sustain blunt force injury, have a lower injury severity score, and to receive VTE prophylaxis (table 1). There were no clinically significant differences in coagulation profile. The TXA cohort had significantly lower mortality (17% v 34%) and required less blood product transfusion (table 2). VTE rate was lower in the TXA group (10% v 16%, $p=0.001$), but no difference was noted on multivariate analysis ($p= 0.21$). There was no difference in incidence of CVA or MI.

Conclusions: There is no association between TXA and VTE but use of TXA is associated with decreased transfusion need and lower mortality following injury.

Table 1 Patient Demographics

Variable	No TXA (n=446)	TXA (n=887)	p-value
Age	40.3 ± 18.2	41.0 ± 18.1	0.3823
Female	85 (19.1)	407 (45.9)	<0.0001
Blunt Injury	254 (57%)	654 (74%)	<0.0001
Injury severity score	27 (17, 38)	25 (16, 34)	<0.0001
VTE prophylaxis given	266 (60%)	713 (80%)	<0.0001

Reported as # (%), mean ± standard deviation, or median (interquartile range)

Table 2 Multivariate Adjusted Outcomes

Variable	No TXA (n=446)	TXA (n=887)	Adjusted Odds Ratio (95% Confidence Interval)	p-value
VTE	70 (16%)	86 (10%)	0.78 (0.53 – 1.15)	0.2105
Mortality	150 (34%)	153 (17%)	0.67 (0.45 – 0.98)	0.0365
MI	4 (0.9%)	7 (0.8%)	1.11 (0.31 – 3.94)	0.8772
CVA	11 (2.5%)	13 (1.5%)	0.76 (0.31 – 1.91)	0.5649
Packed Red Blood Cells (units)	11 (7, 16)	8 (2, 17)	N/A	<0.0001
Plasma (units)	7 (3, 12)	4 (0, 11)	N/A	<0.0001
Platelets (units)	2 (1, 3)	1 (0, 3)	N/A	0.0011

Reported as # (%) or median (interquartile range); aOR=Adjusted Odds Ratio; N/A=Not Applicable for continuous outcome. Adjusted for: gender, heart rate, mechanism, ISS, VTE prophylaxis, missed doses, co-morbid conditions

Paper #14
January 16, 2020
2:45 pm

TIMING AND VOLUME OF CRYSTALLOID AND BLOOD PRODUCTS IN PEDIATRIC TRAUMA: AN EAST PROSPECTIVE MULTICENTER STUDY

Stephanie F. Polites, MD, MPH, Suzanne Moody, MPA, Regan Williams, MD, MSE*, Mark L. Kayton, MD*, Thomas J. Schroeppel, MD*, William Rothstein, MD, Joanne Baerg, MD, FACS, Rachel M. Nygaard, PhD, Cynthia Greenwell, BSN, RN, Alicia Waters, MD, Jeffrey Pence, MD, FACS, Matthew Santore, MD, FACS, FAAP, John Petty, MD*, Brian K. Yorkgitis, DO, FACS*, Eric M. Campion, MD*, Denise Garcia, MD, MEd, Taleen MacArthur, MD, Christa Black, MPH, Shawn Safford, MD, MAS*, Jessica Rae, MD, Bethany Farr, MD, Anna Goldenberg-Sandau, DO*, Emily Alberto, MD, Bavana Ketha, MD, Carrie Laituri, MD*, Megan Cunningham, MD, Todd Jenkins, PhD, Richard A. Falcone, Jr., MD, MPH*
Cincinnati Children's Hospital Medical Center

Presenter: Stephanie F. Polites, MD, MPH

Discussant: Terri Elsbernd, MS, RN, CEN, CPEN, Mayo Clinic

Objectives: The purpose of this study was to determine the relationship between timing and volume of resuscitative fluids and mortality in pediatric trauma, hypothesizing that earlier transfusion and decreased crystalloid would be associated with improved outcomes.

Methods: A prospective observational study of patients <18 years who presented with elevated age-adjusted shock index from scene of injury was performed 3/2018-6/2019. Prehospital, ED, and initial admission resuscitation was assessed including calculation of 20±10 mL/kg crystalloid boluses. Factors significant on univariate analyses were included in multivariable cox proportional hazards and logistic regression models for hospital mortality and extended intensive care, ventilator, and hospital days (≥90th percentile).

Results: In 493 children at 25 trauma centers, median (IQR) age was 7 (2-13) years, ISS 9 (2-22), and mortality 6%. Of 229 (47%) patients who received ≥1 crystalloid bolus, 102 (21%) received blood including 52 (11%) with massive transfusion activation. The transfusion rate plateaued after the first bolus (Figure). Patients who received blood first had shorter median time to transfusion (15 vs 79 minutes, p<.001) and less total crystalloid (19 vs 37 mL/kg, p=.012) than those who received crystalloid first (n=67) despite similar ISS (median 25 vs 26, p=.29). On multivariable analysis there was no association of resuscitation characteristics with mortality however <1 crystalloid bolus prior to transfusion had decreased odds of extended ventilator and hospital days (Table).

Conclusions: Resuscitation with >1 crystalloid bolus was not associated with decreased transfusion or improved outcomes but rather increased ventilator duration and hospital stay in this study. These data support a crystalloid-sparing, early transfusion approach for injured children who require resuscitation though low event rates necessitate further study.

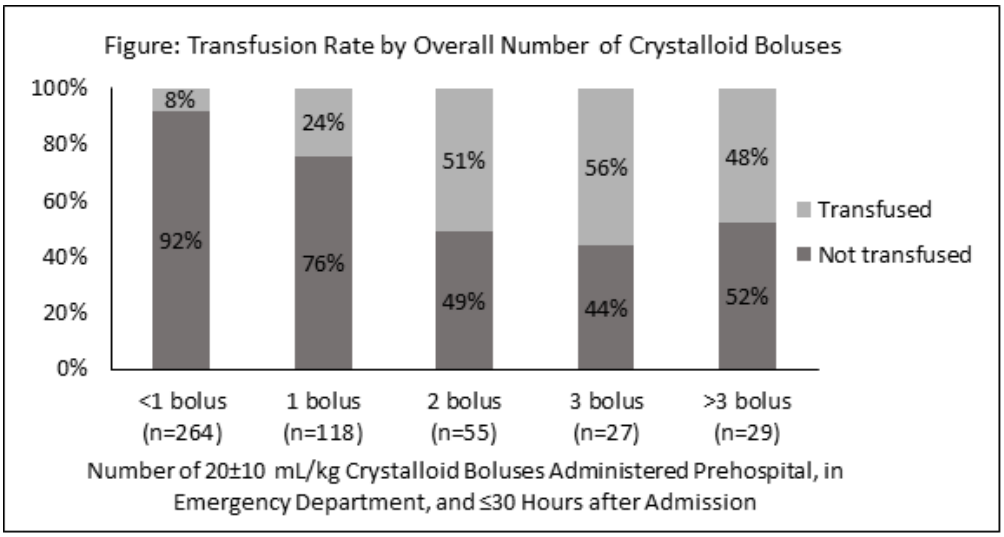


Table: Cox Proportional Hazards and Logistic Regression Analysis of Key Outcomes

Factor Significant on Univariate Analysis (p<.05)		Mortality	Extended (>4) Ventilator Days R2=0.85	Extended (>9) ICU Days R2=0.92	Extended Hospital Days (<14) R2=0.76
Blunt vs penetrating injury		HR+0.77 (0.20-2.93) P=.70	OR=2.13 (0.30-15.40) P=.45	OR=18.02 (1.00-324.05) P=.049	OR=2.57 (0.68-9.90) P=.17
ISS (per unit increase)		HR=1.04 (1.00-1.08) p=.040)	OR=1.09 (1.01-1.17) P=.014	OR=1.14 (1.03-1.25) P=.002	OR=1.03 (0.99-1.07) P=.45
Number of crystalloid boluses prior to transfusion (vs <1)	1	HR=0.72 (0.19-2.73) P=.63	OR=2.88 (0.35-23.65) P=.32	OR=1.06 (0.12-9.06) P=.96	OR=2.09 (0.49-8.84) P=.32
	2	HR=0.31 (0.4-2.58) P=.28	OR=10.22 (1.42-73.37) P=.021	OR=3.63 (0.42-31.46) P=.24	OR=5.34 (1.17-24.41) P=.031
	3	*	OR=1.82 (0.09-35.15) P=.69	*	OR=4.08 (0.29-57.52) P=.30
	>3	HR=2.14 (0.20-22.84) P=.53	OR=14.96 (0.30-756.41) P=.18	OR=129.17 (0.73-22699.41) P=.07	OR=7.00 (0.37-131.59) P=.19

Preexisting comorbidity, time from injury to hospital arrival, and time from hospital arrival to transfusion were independent variables in all four models and p>.05 for all outcomes. *Few (n=18) patients received 3 crystalloid boluses prior to transfusion.

Paper #15
January 16, 2020
3:05 pm

PROSPECTIVE VALIDATION OF THE EMERGENCY SURGERY SCORE (ESS) IN EMERGENCY GENERAL SURGERY: AN EAST MULTICENTER STUDY

Haytham Kaafarani, MD, MPH*, Napaporn Kongkaewpaisan, M.D., Brittany Aicher, MD*, Jose J. Diaz, MD*, Lindsay O'Meara, CRNP*, Cassandra Decker, BA, Jennifer Rodriquez, CRC, Thomas J. Schroeppel, MD*, Rishi Rattan, MD*, Georgia Vasileiou, D. Dante Yeh, MD, FACS, FCCM*, Ursula J. Simonoski, BS, David Turay, MD, PhD*, Daniel C. Cullinane, MD*, Emmert Cory, DO, Marta McCrum, MD, MPH*, Natalie Wall, BS, Jeremy Badach, MD, Anna Goldenberg-Sandau, DO*, Heather E. Carmichael, MD, Catherine Velopulos, MD, MHS, FACS*, Rachel L. Choron, MD*, Joseph V. Sakran, MD, MPH, MPA, FACS*, Khaldoun Bekdache, MD*, George Black, MD, Thomas Shoultz, MD*, Zachary Chadnick, MD, Vasiliy Sim, MD*, Firas G. Madbak, MD, FACS*, Daniel A. Steadman, DO, Maraya N. Camazine, BS, Martin D. Zielinski, MD, FACS*, Claire Hardman, BSN, Mbaga S. Walusimbi, MD*, Mirhee Kim, BA, Simon Rodier, MD, Vasileios N. Papadopoulos, MD, Georgios Tsoulfas, MD, J. Martin Perez, MD*, George Velmahos, MD, PhD, MSEd
Massachusetts General Hospital

Presenter: Haytham Kaafarani, MD, MPH

Discussant: Linda Dultz, MD, MPH, UTSW Parkland Hospital

Objectives: The Emergency Surgery Score (ESS) was recently created and retrospectively validated as an accurate mortality risk calculator for Emergency General Surgery (EGS). We sought to *prospectively* validate ESS, specifically in the high-risk emergency laparotomy (EL) patient.

Methods: This is an EAST multicenter prospective observational study. Between April 2018 and May 2019, 19 centers enrolled all patients older than 18 undergoing EL. Preoperative, intraoperative and postoperative variables were prospectively and systematically collected. ESS was calculated for each patient. ESS was validated using the c-statistic methodology by correlating it with three 30-day postoperative outcomes: 1) mortality, 2) complications (e.g. respiratory/renal failure, infection), and 3) ICU admission.

Results: A total of 1,646 patients were included. The mean age was 60.5 years, 50.3% were female, and 71.4% were white. The mean and median ESS were 6, and the most common indication for EL was hollow viscus perforation (29.5%). The 30-day mortality, complication and ICU admission rates were 14.8%, 53.3% and 57.0%, respectively. ESS gradually and accurately predicted 30-day mortality; 3.5%, 50.0% and 85.7% of patients with an ESS of 3, 12 and 17 died after surgery, respectively (Figure 1, c-statistic 0.85). Similarly, ESS gradually and accurately predicted complications; 21.0%, 57.1% and 88.9% of patients with an ESS of 1, 6 and 13 developed postoperative complications, respectively (Figure 2, c-statistic 0.74). ESS also accurately predicted which patients required ICU admission (c-statistic 0.80).

Conclusions: This is the first prospective multicenter study to validate ESS as an accurate predictor of outcome in the EL patient. ESS can prove useful for 1) perioperative patient and family counseling, 2) triaging patients to the ICU and 3) benchmarking the quality of EGS care.

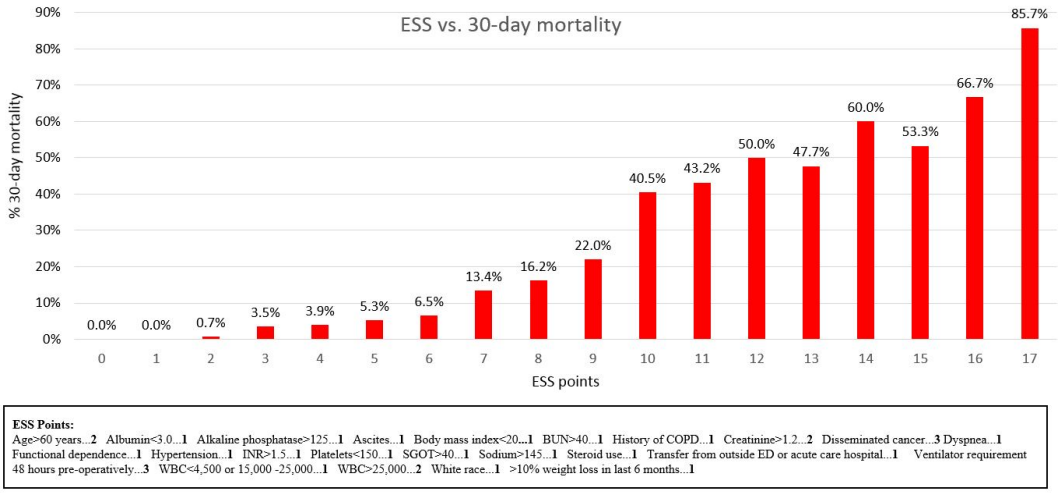


Figure1: ESS vs. 30-day mortality

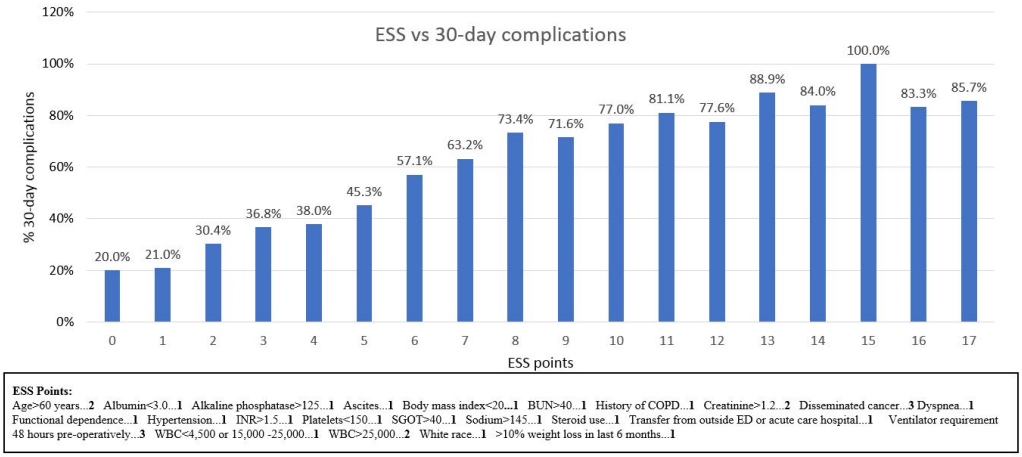


Figure2: ESS vs. 30-day complications

Paper #16
January 16, 2020
3:25 pm

DELIRIUM AND USE OF REGIONAL ANALGESIA TECHNIQUES IN OLDER ADULTS WITH MULTIPLE RIB FRACTURES: AN EAST MULTICENTER STUDY

Kathleen M. O'Connell, MD*, Kushang Patel, PhD, MPH, Elisabeth Powelson, MD, MSc, Bryce R.H. Robinson, MD, MS, FACS, FCCM*, Marta McCrum, MD, MPH*, Jacob Peschman, MD*, Kelly Boyle, MD, Jessica Ballou, MD, Joshua Judge, MD*, Justin Leavitt, Shannon Greenberg, MD, Ethan Blocher-Smith, MS, DO, Kaushik Mukherjee, MD MSCI FACS*, Lewis E. Jacobson, MD, FACS*, Karen Brasel, MD, Monica Vavilala, MD, Frederick Rivara, MD, MPH, Saman Arbabi, MD, MPH*
University of Washington

Presenter: Kathleen M. O'Connell, MD

Discussant: Nimitt Patel, MD, MetroHealth Medical Center

Objectives: Single center data demonstrated that regional analgesia (RA) techniques reduce risk of delirium in older patients with multiple rib fractures. We sought to investigate this association in a multicenter patient population.

Methods: Data from 7 Level-I trauma centers were collected for patients =65 years old, admitted to an ICU, with =3 rib fractures from 1/2012-12/2016. Those with a head and/or spine injury AIS =3, or a history of dementia were excluded. Delirium was defined as one positive Confusion Assessment Method for the ICU score in the first 7 days of ICU care. Poisson regression with robust standard errors was used to determine the association of RA (thoracic epidural or paravertebral catheter) with delirium incidence.

Results: Data of 602 patients were analyzed with the median age=75 years [IQR=69-83], ISS=14 [11-19], and ICU LOS=3 days [2-6]. 38.7% of patients were women, 15.6% were non-white, and 32.7% required a chest tube. RA was used in 23.4% patients. Patient characteristics did not differ by RA use, however, ICU LOS was longer (P<0.001) and chest tube placement was more common (P<0.001) in those who had RA. Delirium was more common in patients who had RA (32.1% vs. 23.4% without, P=0.04); however, RA use was not associated with delirium after adjusting for age, ISS, ICU LOS, and chest tube placement (IRR=1.15; 95% CI: 0.81-1.65). RA use was not associated with mortality, ICU readmission, or respiratory complications. Multivariable adjustment and propensity score matching models (RA vs. no RA) yielded similar results.

Conclusions: In this multicenter cohort of injured older adults with multiple rib fractures, regional analgesia use was not associated with lower risk of delirium or other short-term adverse outcomes. Further studies are needed to standardize protocols for optimal pain management and prevention of delirium in older adults with severe thoracic injury.

Paper #17
January 16, 2020
1:45 pm

SURVIVORS OF GUN VIOLENCE AND THE EXPERIENCE OF RECOVERY: UNDERSERVED, UNDERDIAGNOSED, AND UNDERTREATED COMMUNITIES

Kathleen O'Neill, MD, Leonard Jahad, BA, Cecilio Vega, AD,
Pina Violano, PhD, MSPH, RN-BC, CCRN, CPS-T*, Sidney Saint-Hilaire,
Marjorie Rosenthal, MD, MPH, Adrian A. Maung, MD, FACS, FCCM*,
Robert D. Becher, MD, MS, James Dodington, MD
Yale-New Haven Hospital

Presenter: Kathleen O'Neill, MD

Discussant: Sarah Mattocks, MSN, FNP-C, UPMC Hamot

Objectives: Survivors of gun violence may develop significant mental health disorders and are at high risk for re-injury through repeat violence. Despite this, survivors of violent crimes often return to the community without evaluation of their mental health and with little support during recovery. We sought to understand and assess the post-hospitalization recovery experience of gunshot survivors.

Methods: We used a qualitative research study design and a community-based participatory research approach. Partnering with a community-based organization, we developed a semi-structured interview guide for in-depth one-on-one interviews. We used the snowball sampling method for recruitment. Using the constant comparison method of qualitative analysis, we catalogued interview transcript data by assigning conceptual codes and organizing them into a consensus list of themes. We presented the themes back to participants and community members for confirmation.

Results: We conducted 20 interviews with survivors of gun violence; all were Black males, aged 20 to 51 years. Five recurring themes emerged: (1) Isolation: physical and social restriction due to fear of their surroundings; (2) Protection: a disrupted sense of safety leading to maladaptive behaviors including carrying an illegal firearm; (3) Aggression: consideration of retaliation and willingness to use a firearm; (4) Normalization: no reaction at all because gun violence is normal; and 5) Barriers: participants noted barriers to accessing mental health treatment, including distrust of providers.

Conclusions: Survivors of gun violence describe a disrupted sense of safety following their injury. They experience isolation, increased need to carry or use a firearm, normalization of gun violence and barriers to mental health treatment. These maladaptive reactions suggest a mechanism for the violent recidivism seen among survivors of gun violence.

Paper #18
January 16, 2020
2:05 pm

DUSK TO DAWN: EVALUATING THE EFFECT OF A HOSPITAL BASED YOUTH VIOLENCE PREVENTION PROGRAM ON YOUTHS' PERCEPTION OF RISK

Brooke Snyder, BA, Ashley Farrens, MSN, MBA, RN, Melissa Tibbits, PhD,
Jenny Burt, PhD, LP, Zachary M. Bauman, DO, MHA*
University of Nebraska Medical Center

Presenter: Brooke Snyder, BA

Discussant: Krista Haines, DO, Duke University

Objectives: Historically, youth violence prevention strategies used deterrence-based programming with limited success. We developed a youth violence prevention program, Dusk to Dawn (D2D), intended to improve youths' recognition of high risk situations and teach new skills in conflict resolution. The aim of this study was to evaluate the effect of D2D on youths' perceptions of personal risk factors and high risk situations.

Methods: Youth ages 12-18 were referred to D2D by community based organizations, probation, or youth detention center. Youth completed a self-report survey before and after participating in D2D.

Results: 108 youth participated in D2D. Pre and posttest results for self-reported personal risk factors and high risk situations for violence are presented in Table 1. For Personal Risk Factors, a statistically significant increase in the perception that family ($p<.01$) and other issues ($p<.05$), and a decrease in the perception that school problems (<.05) were seen as important personal risk factors. For High Risk Situations, increases in the perception that peer violence and substance use as high risk situations were seen as significant at the trend level ($p<.10$). Of the 60% of participants who answered questions regarding satisfaction with D2D, 83.3% agreed or strongly agreed that D2D helped them to better understand violence and 83.3% would recommend D2D to others.

Conclusions: Youth violence prevention programming including an explicit discussion of how violence is learned and the role of family, friends, school and a community in shaping youths' attitudes towards violence can effectively raise awareness of one's own risk factors. Risk factors for youth violence are often preventable or modifiable, making awareness of one's own risk factors a realistic target for youth violence prevention programs.

Personal Risk Factors	Pretest percentage	Posttest percentage	P value
Peer violence/friends	47	57	
Environment	30	33	
Family	20	35	<.01
Emotions	28	23	
Other issues (money, witnessing death, violent sports)	3	11	<.05
Problems at school	25	15	<.05
High Risk Situations			
Peer violence/friends	44	54	<.10
Weapons	28	26	
Substance use	26	36	<.10

Table 1: Percentage of Participants Who Identified Specific Risk Factors and High Risk Situations at Pre and Posttest

Paper #19
January 16, 2020
2:25 pm

IDENTIFYING PARTICIPANTS FOR INCLUSION IN HOSPITAL BASED VIOLENCE INTERVENTION: AN ANALYSIS OF 18 YEARS OF URBAN FIREARM RECIDIVISM

Stephanie Bonne, MD*, Zachary Coles, BA, Nina Glass, MD*,
Anastasia Kunac, MD*, David H. Livingston, MD*
Rutgers-New Jersey Medical School

Presenter: Stephanie Bonne, MD

Discussant: Randi Smith, MD, MPH, Emory University School of Medicine

Objectives: Hospital Based Violence Intervention Programs (HVIP) may prevent violent injury recidivism. However, programs are intensive and expensive. To maximize efficacy of HVIPs identification of high risk individuals is needed. The purpose of this study was to describe the characteristics of GSW recidivists to identify the the highest risk population.

Methods: Retrospective analysis was done on all patients sustaining GSW that presented to a single urban level 1 trauma center from January 2000 to September 2017, along with all countywide murders. Recidivists were any patient presenting twice or presenting once and subsequently dying by firearm. Subgroup analysis was performed on future recidivists compared to all firearm injury patients.

Results: 7,717 GSW cases were reviewed, 299 died, leaving 7,418 at risk of recidivism. 509 (6.9%) became recidivists. 58% of index GSWs were treated and released (T&R) from the ED. African Americans represent 86% of GSWs but 97% of recidivists $p<0.05$).

At index visit, future recidivists were younger (22 vs, 26, $P<0.05$), with a bimodal age distribution and 100% male. Median time between incidents was 2.5 years but was significantly higher for recidivists who died at the second incident (861 vs 1261 days, $p<0.05$). Future recidivists had lower ISS on index hospitalization.

135 recidivists died at second incident, 17 at later incidents. Mortality at second incident is higher than all-first injuries (27% vs 4%, $p<0.05$). 110 (22%) recidivists required inpatient hospitalization at their second injury. Second hospitalizations are more costly ($50,238 vs. $80,091, $p<0.05$).

Conclusions: Our HVIP offers greatest benefit to young black men. HVIP services are needed in the ED, as many patients are T&R at initial injury. Recidivists are more likely to be severely injured, die, or have costly hospitalizations, thus, the investment in HVIPs is justified.

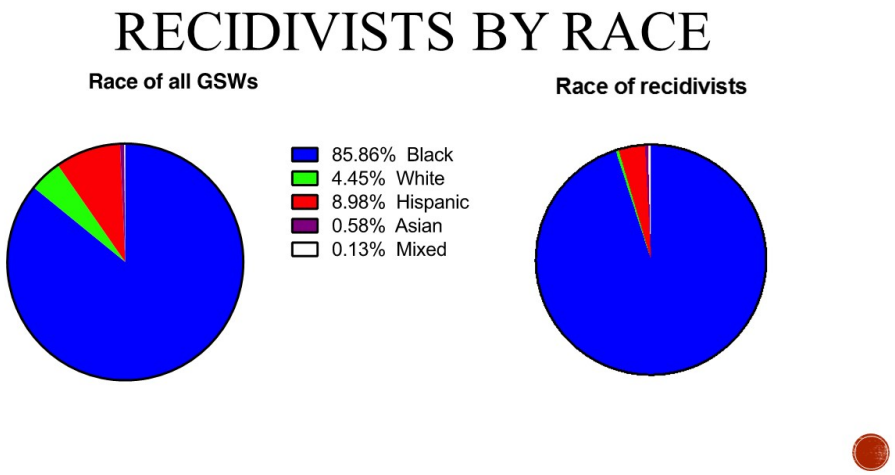


Figure 1: Recidivists by race: Race of future recidivists is mostly African American or Hispanic.

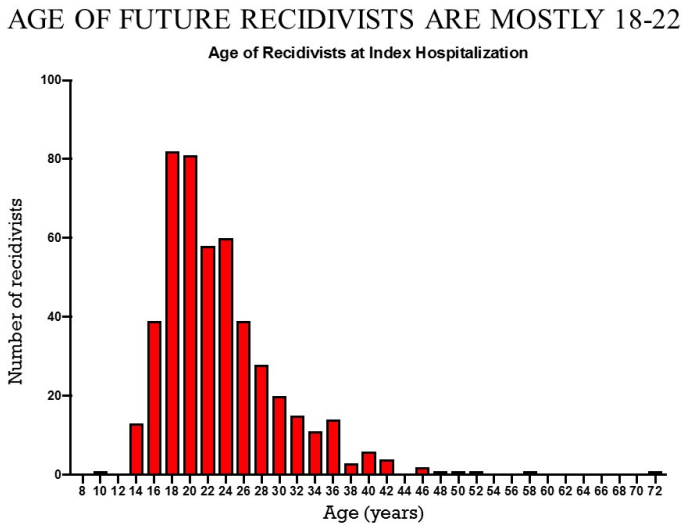


Figure 2: Recidivists by Age: Future recidivists had a slightly bimodal age distribution but are typically age 18-22 at their index hospitalization

Paper #20
January 16, 2020
2:45 pm

HEROES IN CRISIS: TRAUMA CENTERS SHOULD BE SCREENING FOR AND INTERVENING ON POST-TRAUMATIC STRESS IN OUR EMERGENCY RESPONDERS

Leah C. Tatebe, MD, FACS*, Nandini Rajaram Siva, MBBS, Christina Brown, BS, Andrew Wheeler, LCSW, Carol Reese, Caroline Butler, MD*, Matthew Kaminsky, MD*, Thomas A. Messer, MD*, Victoria Schlanser, DO*, Frederic L. Starr, MD*, Faran Bokhari, MD, MBA, FACS, FACP*, Andrew J. Dennis, DO, FACS, FACOS*
Stroger Cook County Hospital

Presenter: Leah C. Tatebe, MD, FACS

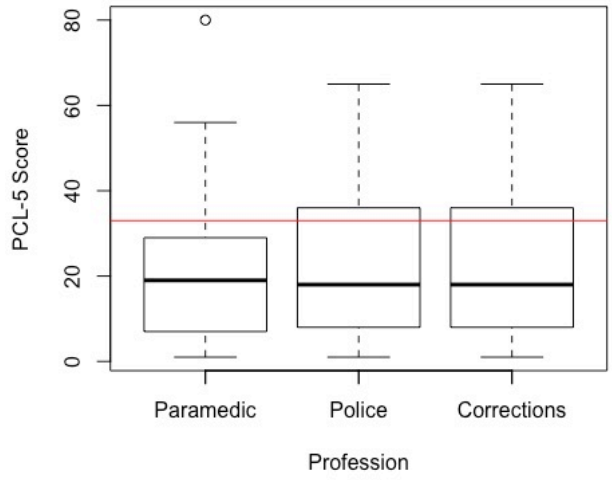
Discussant: Jennifer Hartwell, MD, Indiana University Methodist Hospital

Objectives: Rising suicide rates is a crisis facing emergency responders, and many resist seeking help due to stigma surrounding mental health. We sought to evaluate the feasibility of an urban trauma center to screen for Post-Traumatic Stress (PTS) and provide mental health services to emergency responders.

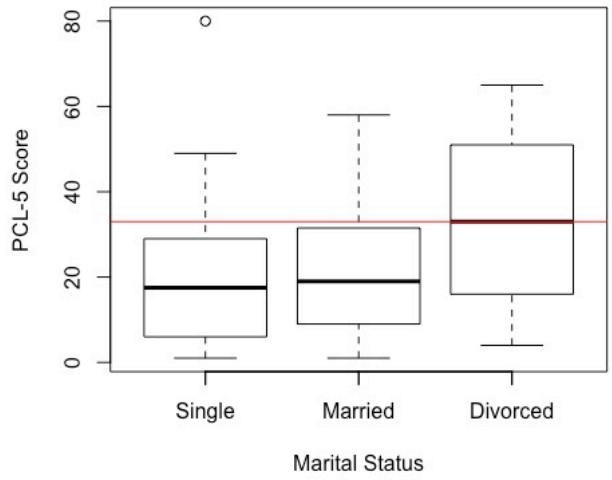
Methods: Paramedics, firefighters, law enforcement, and corrections officers involved with victims of trauma in the trauma unit were asked to complete the Post-Traumatic Checklist for DSM-5 (PCL-5). Additional factors known to affect PTS were correlated: occupation, age, gender, years of service, marital status, children, and pets. Willingness and barriers to seeking interventions for PTS were evaluated.

Results: A total of 221 responded: 42% paramedics, 40% law enforcement officers, 13% corrections officers, 1% firefighters, and 4% held multiple positions. Responders had a mean of 13.2 years of service (SD 9.6). Overall, 24.5% had diagnostic PTS Disorder with no difference seen in rates between professions (Figure 1). Of these, 78.8% had not sought care. Barriers included that they were not concerned (43.9%), did not recognize symptoms (25.4%), and were worried about consequences (19.5%). Concern over career advancement or losing one's job was the greatest barrier cited for seeking care for all responders. 46% of police were concerned that they would lose their ability to carry a firearm if they sought care for PTS. Divorce was the only factor examined that correlated with increased PCL-5 score (Figure 2). 83.2% overall and 73.1% of those with diagnostic PTS felt the trauma center was the right place to screen and intervene upon PTS.

Conclusions: Trauma centers can be an ideal safe place to both screen for PTS and offer mental health assistance. Comprehensive trauma-informed care by hospital-based intervention programs must expand to include emergency responders.



PCL-5 score by profession with a score over 33 (red line) highly indicative of Post-Traumatic Stress Disorder (PTSD), median and IQR are shown.



PCL-5 score by marital status with a score over 33 (red line) highly indicative of Post-Traumatic Stress Disorder (PTSD), median and IQR are shown. PTSD rates were significantly higher in divorced responders compared to married ($p = 0.04$) and single ($p = 0.02$) responders.

Paper #21
January 16, 2020
3:05 pm

THE HOMELESS PEDESTRIAN: A NEW CATEGORY OF VULNERABLE ROAD USER

Rebecca E. Plevin, MD, Megan Wier, MPH, Shamsi Soltani, MPH,
Adaobi Nwabuo, MBBS, MPH, Mimi Tam, BA, Devan Morris, BS,
Rachael A. Callcut, MD, MSPH, FACS*, Catherine Juillard, MD, MPH
University of California San Francisco

Presenter: Rebecca E. Plevin, MD

Discussant: Laurie J. Punch, MD, Washington University School of Medicine

Objectives: Homeless individuals in the United States are at increased risk of traumatic injury. There is little research characterizing the burden of motor vehicle traffic-related mortality in the homeless. We hypothesize that people without housing are disproportionately represented in traffic-related deaths and seek to identify high-risk locations for these fatalities.

Methods: We performed a retrospective review of 2012-2018 mortality data obtained from our city medical examiner. We analyzed all traffic injury-related mortalities in patients without a fixed home address as a conservative proxy for homelessness. Mortality location data were overlaid onto a map of city freeways and the Vision Zero High-injury Network (HIN), a network of 13% of streets where 75% of severe & fatal traffic injuries occur.

Results: 12% of fatalities were in people without a fixed home address, who comprise <1% of our city's population. The mean victim age was 44.5 years, and 91% were male (Table 1). The majority of the deaths (63%) were due to automobile vs. pedestrian injuries. The remainder were due to motor vehicle collisions (MVC) or motorcycle collisions (MCC), trains vs. pedestrians (14%), and bicycles/skateboards vs. motor vehicles (9%). Additionally, 72% of the deaths occurred at night and 28% occurred on freeways, including 9/27 auto vs. pedestrian fatalities. Figure 1 overlays the fatality locations onto a map of the city's freeways and the HIN. 79% (34/43) of fatalities occurred on a freeway or one of the streets within the HIN.

Conclusions: A significant proportion of traffic-related fatalities in the homeless population occurred at night and while walking on freeways or using streets within the HIN. By characterizing disproportionate representation of the homeless in traffic-related deaths, we call attention to the need for deeper coordination between health care, public health, transportation, and housing disciplines to address this public health crisis in an acutely vulnerable population.

	Number of patients (%)
Age, mean	44.5
Gender	
Male	39 (91)
Female	4 (9)
Injury Mechanism	
Auto vs. Pedestrian	27 (63)
MVC/MCC	6 (14)
Train vs. Pedestrian	6 (14)
Auto vs. Bike/skateboard	4 (9)
Injury on freeway	
Yes	12 (28)
No	31 (72)
Time of Injury	
Day (06:00 - 18:00)	12 (28)
Night (18:00 - 06:00)	31 (72)

Table 1

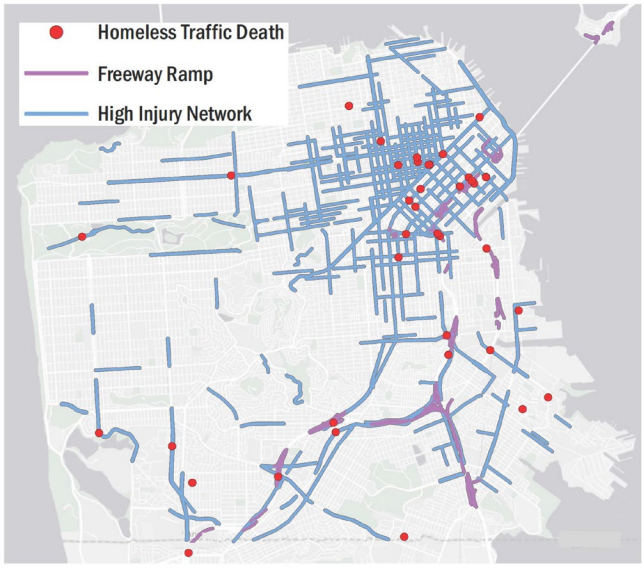


Figure 1

Paper #22
January 16, 2020
3:25 pm

DO RIDE SHARING SERVICES AFFECT THE INCIDENCE OF ALCOHOL-RELATED MOTOR VEHICLE COLLISIONS?

Vera Hendrix, MD, Jessica Friedman, MD, Judy Fustok, MS, Tara Reza, BS,
Scott Mayer, MD, Prathima Madda, BS, Patrick Greiffenstein, MD*
Juan C. Duchesne, MD, FACS, FCCP, FCCM*, Rebecca W. Schroll, MD, FACS*
Tulane University School of Medicine

Presenter: Vera Hendrix, MD

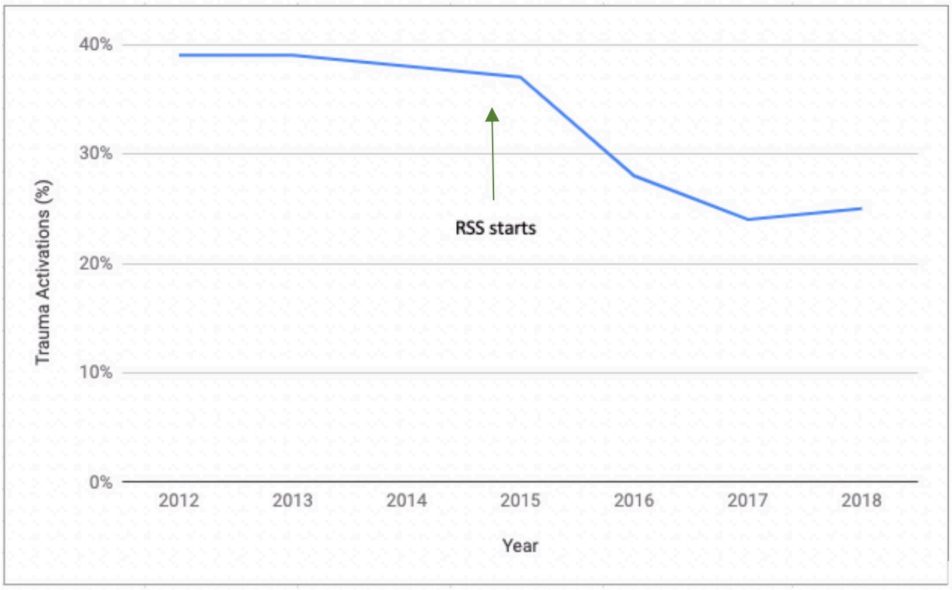
Discussant: Jon Dorfman, MD, UMass Memorial

Objectives: Alcohol-related motor vehicle collisions (AR-MVCs) account for ~30% of all U.S. traffic fatalities. Ride-sharing services (RSS) have existed since 2010, but few studies to date have investigated their impact on AR-MVCs. We hypothesized that the availability of RSS would be correlated with a decrease in AR-MVCs at an urban level 1 trauma center.

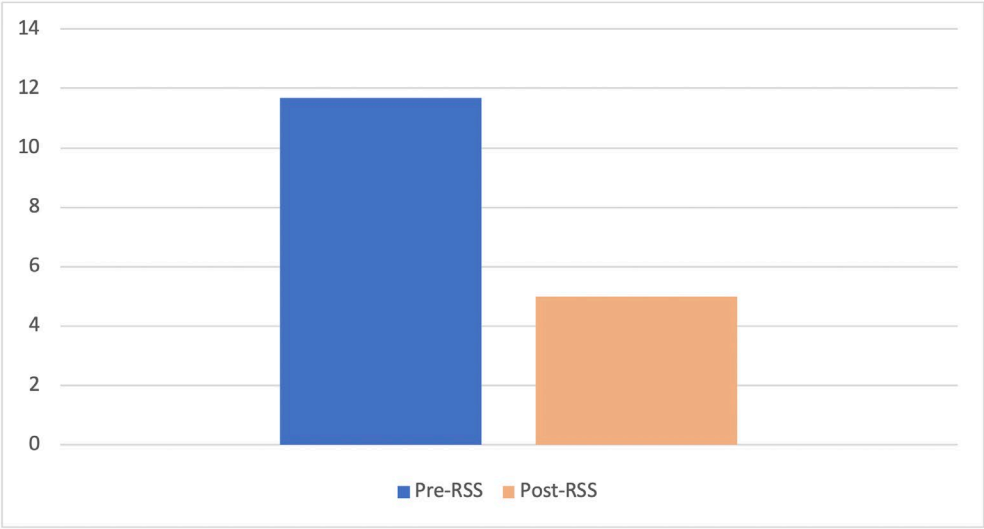
Methods: A retrospective chart review was conducted of all AR-MVC trauma activations at a Level 1 trauma center from 2012-2018. Additional data were gathered from regional traffic databases including crash incidence, fatalities, blood alcohol content (BAC) and demographics. Data were compared pre-and post-RSS and analyzed using an unpaired t-test with $p<0.05$ considered significant.

Results: There were 1474 patients in AR-MVCs during the study period. There was a significant decrease in the annual average proportion of MVCs that were AR-MVCs pre- vs post-RSS (39% vs. 29%, $p=0.04$) as well as a decrease in the average annual incidence of fatal AR-MVCs (11.6 vs 5, $p=0.02$). We found a similar decrease in the incidence of regional AR-MVCs post-RSS by 18%. Post-RSS, AR-MVC incidence decreased in the 21 to 24-year-old age group (14.3 vs 10, $p=0.04$), but there were no significant differences in other age groups, or by race or gender. There was no difference in average BAC for AR-MVC patients pre- vs post-RSS.

Conclusions: We found that the incidence of both total AR-MVCs and fatal AR-MVCs presenting to our trauma center decreased after the introduction of RSS, particularly in young adults. RSS may play a role in preventing AR-MVCs. Further research is needed to correlate AR-MVC incidence with granular proprietary RSS usage data and to account for any confounding factors. Future studies may identify ways to better utilize RSS availability as a targeted intervention for certain demographic groups to prevent AR-MVCs.



Incidence of alcohol-related motor vehicle collisions (AR-MVCs) over time



Average annual incidence of fatal alcohol-related motor vehicle collisions (AR-MVCs) pre- vs post- ride sharing service (RSS) availability.

Paper #23
January 17, 2020
7:45 am

BLOOD-BASED BIOMARKERS FOR PREDICTION OF INTRACRANIAL HEMORRHAGE AND OUTCOME IN PATIENTS WITH MODERATE OR SEVERE TRAUMATIC BRAIN INJURY

Taylor Anderson, BS, Jun Hwang, MS, Barbara McKnight, PhD, Myrna Munar, PharmD, Linda Papa, MD, Holly E. Hinson, MD, MCR, Susan E. Rowell, MD, MCR*
Duke University Medical Center

Presenter: Taylor Anderson, BS

Discussant: Michael Goodman, MD, University of Cincinnati Medical Center

Objectives: Early identification of traumatic intracranial hemorrhage (ICH) has implications for triage and intervention. Blood-based biomarkers were recently FDA approved for prediction of ICH in patients with mild traumatic brain injury (TBI). We sought to determine if these biomarkers measured early after injury improve prediction of ICH, mortality, and neurologic outcome over Glasgow Coma Scale score (GCS) alone in patients with moderate or severe TBI.

Methods: We measured glial-fibrillary-acidic-protein (GFAP), ubiquitin-C-terminal-hydrolase-L1 (UCH-L1), and microtubule-associated-protein-2 (MAP-2) on ED arrival in patients with TBI enrolled in the placebo arm of the Prehospital TXA for TBI Trial (GCS 3-12, SPB > 90). Biomarkers were modeled individually and together with prehospital predictor variables [PH] (GCS, age, gender). Data were divided into a training dataset for model derivation and testing dataset for model evaluation. Models were evaluated for prediction of ICH, mortality, and long-term neurologic outcome. AUC was evaluated for PH alone, PH+individual biomarkers, and PH+3 biomarkers.

Results: Of 243 patients with baseline samples (obtained a median 84 min after injury), prehospital GCS was 8 (IQR 5,10), 55% had ICH, and 48-hr and 28-day mortality was 7 and 13%. Poor neurologic outcome at 6 months was observed in 34% based on a Glasgow Outcome Scale-Extended (GOSE) <=4, and 24% based on a Disability Rating Scale (DRS) score >7. Addition of each biomarker to PH improved AUC in the majority of predictive models. GFAP+PH compared to PH alone significantly improved AUC in all models [ICH: 0.82 vs 0.64; 48-hour mortality 0.84 vs 0.71; 28-day mortality: 0.84 vs 0.66; GOSE: 0.78 vs 0.69; DRS 0.84 vs 0.81, all $p<0.001$].

Conclusions: Blood-based biomarkers may improve prediction of ICH and outcome in patients with moderate or severe TBI over prehospital characteristics alone. GFAP appears to be the most promising. Future evaluation in the prehospital setting is warranted.

Paper #24
January 17, 2020
8:05 am

PLATELET TRANSFUSIONS DO NOT CORRECT TRAUMA INDUCED PLATELET DYSFUNCTION

Julie S. Kim, BS, Madhu Subramanian, MD*, Lily Tung, MD*, Sanjna Surya, BS, Andrew Hu, BS, Antonio Davila, PhD, Carrie A. Sims, MD*
Hospital of the University of Pennsylvania

Presenter: Madhu Subramanian, MD

Discussant: Nicole Krumrei, MD, Robert Wood Johnson University Hospital

Objectives: Platelets play an integral role in hemostasis with abnormal function implicated in trauma-induced coagulopathy (TIC). The impact of platelet transfusion (PLTs) on correcting platelet dysfunction (PD) during traumatic hemorrhage; however, remains unclear. The aim of this study was to determine whether PLTs effectively correct PD during hemostatic resuscitation.

Methods: Blood samples and clinical data were prospectively collected from adult trauma patients admitted to our Level I urban trauma center from March 2017 to May 2019 who required ICU admission. Samples were taken on arrival and serially at 3h, 6h, 12h, and 24h. In addition to standard clinical labs, samples were analyzed by thromboelastography with platelet mapping (TEG-PM). Patients with PD ($MA_{ADP} < 40mm$) transfused with PLTs were compared to those not transfused using Chi-Square and Mann-Whitney U tests. Additionally, in patients receiving PLTs, TEG-PM values were compared pre and post transfusion using paired t-tests. $P < 0.05$ was considered significant.

Results: Of the 93 patients, PD was seen in 56.5% on admission. Admission PD was associated with a higher injury severity score, penetrating trauma, and an increased mortality at 24h and 30d. However, mortality rate was similar in patients with PD despite PLT transfusion. Paradoxically, PLT transfusion did not increase platelet counts in patients with PD. At all timepoints, platelet hypofunction to ADP stimulation were similar in patients with PD regardless of PLT transfusion status. Moreover, PLT dysfunction persisted with no significant differences in pre and post transfusion TEG-PM values.

Conclusions: PD is common in trauma patients and current hemostatic resuscitation strategies do not appear to restore platelet function. Further research is needed to determine if the persistent PD observed is secondary to platelet storage lesion, insufficient transfusion strategies, or the result of ongoing TIC.

	T0	T3	T6	T12	T24	
Platelet count	199 (166-223)	99 (89-137)	131 (85-145)	90 (76-110)	116 (81-132)	**Platelets Transfused**
Platelets transfused	…	2 (1-2)	1 (1-2.3)	2 (1-2.8)	1.5 (1-3)	
MA_{ADP}	20.4 (6.9-27.0)	17.2 (2.6-29.2)	6.2 (4.2-20.6)	31 (7.3-43.1)	48 (37.9-56.9)	
% ADP inhibiton	71.7 (55.4-79.2)	74.8 (46.8-94.5)	91.4 (59.1-95.7)	53.4 (38.9-95.4)	45.9 (29.9-55.4)	
Platelet count	197 (178-278)	155 (132-172)	127 (104-172)	131 (99-165)	119 (79-146)	**No Platelets Transfused**
MA_{ADP}	8.3 (3.6-20.4)	13.4 (7.2-35.6)	16.4 (7.2-21.2)	20.2 (7-29.5)	38.4 (16.5-53.3)	
% ADP inhibiton	93 (57.3-99.6)	78.7 (40.9-93.5)	81.8 (62.7-93.5)	75.2 (50.9-93.7)	47.3 (22.3-94.3)	
Platelet count ***P*-value**	0.58	0.06	0.44	**0.02**	0.76	***P* - values**
MA_{ADP} ***P*-value**	0.12	0.31	0.11	0.49	0.21	
% ADP inhibiton ***P*-value**	0.18	0.76	0.27	0.56	0.67	

T0 & T3 (PLTs n = 39, no PLTs n = 20), T6 (PLTs n = 14, no PLTs = 44), T12 (PLTs n = 14, no PLTs = 42), T24 (PLTs n = 10, no PLTs n = 46)
Values in parentheses are interquartile ranges for continuous variables. *P*-values compare PLTs transfused versus no PLTs transfused (Mann-Whitney *U* test or Fisher's exact test).
Coagulopathy defined if MAADP < 40 mm, % ADP inhibition > 60; MA = maximum amplitude, ADP = adenosine phosphate

Table 1. Changes in **TEG**-PM Parameters at All **Timepoints** in Patients with Platelet Dysfunction Transfused with and without Platelets

Paper #25
January 17, 2020
8:25 am

HEMOSTATIC POTENTIAL OF COLD-STORED WHOLE BLOOD OVER TIME: AN ASSESSMENT OF PLATELET FUNCTION AND THROMBIN GENERATION FOR OPTIMAL SHELF-LIFE

Scott Assen, MD, Jessica Cardenas, PhD, Mitchell George, MD, Yao-Wei Wang, PhD, Charles E. Wade, PhD, David Meyer, MD, MS*, Bryan A. Cotton, MD, MPH
University of Texas Health Science Center at Houston

Presenter: Scott Assen, MD

Discussant: David Morris, MD, Intermountain Medical Center

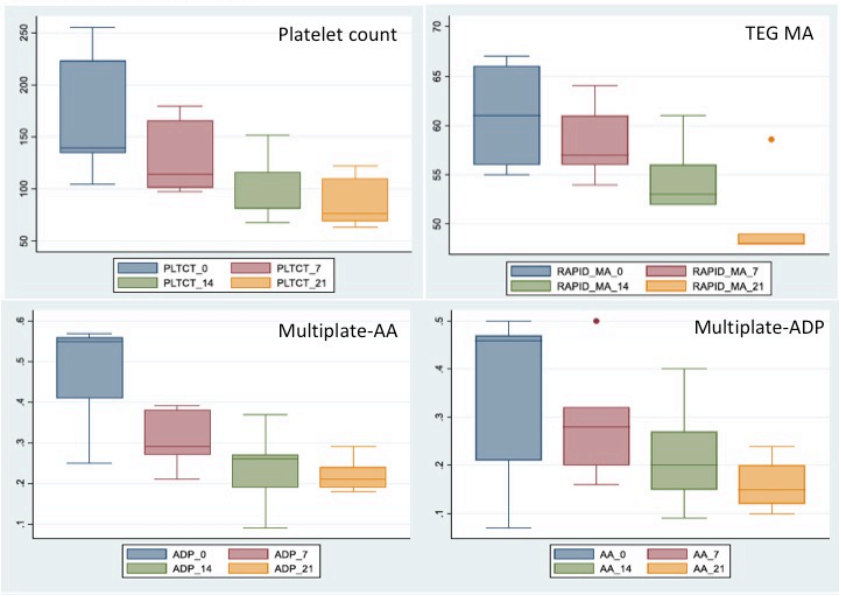
Objectives: Cold-stored low-titer whole blood (WB) is becoming increasingly used as the preferred product for initial hemorrhagic shock resuscitation. The purpose of this study was to identify whether the current 21-day shelf-life is the optimal duration for storage of WB, maintaining hemostatic efficacy.

Methods: Five units of fresh low-titer group O WB (non-leukoreduced) were acquired from our regional blood center. These units were stored at 4º C for up to 21 days as per current clinical storage guidelines in our emergency department. Hemostatic parameters were measured *in vitro* at 0, 7, 14, and 21 days. Assessments of hemostatic potential included cell count, rapid (r-TEG) and kaolin thrombelastography (TEG), Multiplate impedance aggregometry, and calibrated automated thrombogram (CAT). Univariate analysis, including one-way ANOVA with repeated measures, was performed (STATA 12.1).

Results: Compared to baseline product (0 days), both platelet count and platelet function of WB showed sharp decreases at 7 days and again at 14 days. Platelet function deterioration was noted by r-TEG maximal amplitude (MA), TEG-MA, and Multiplate AA and ADP (Figure 1); all $p<0.001$. With respect to clot initiation, r-TEG ACT and TEG R-time were similar over the 21 day shelf-life; $p=0.058$ and $p=0.620$, respectively. Thrombin generation assessed by CAT demonstrated stable endogenous thrombin potential (ETP) over the course of storage ($p=0.162$), but improved peak thrombin generation and quicker time to peak generation after 7 days (Figure 2).

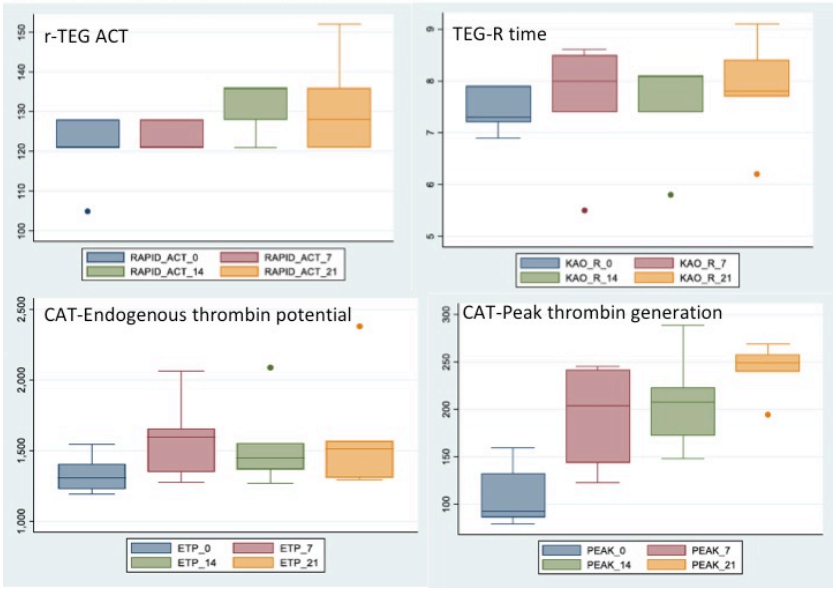
Conclusions: While the platelet function of WB degrades significantly at 7 days (and again at 14-days), clot initiation remains stable over time and thrombin generation appears to be improved at 7 days. This study supports a current storage limit for cold-stored, low-titer WB of 14-days.

Figure 1. Platelet parameters



Platelet parameters of cold-stored whole blood over time

Figure 2. Clot initiation and thrombin generation



Clot initiation and thrombin generation of cold-stored whole blood over time

Paper #26
January 17, 2020
8:45 am

OVERTRANSFUSION COMES AT A SIGNIFICANT COST: THE DOSE-DEPENDENT RELATIONSHIP BETWEEN BLOOD TRANSFUSIONS AND INFECTIONS AFTER MAJOR TRAUMA

Charlie Nederpelt, BSc, Majed el Hechi, MD, Alexander Bonde, BSc,
Nikos Kokoroskos, MD, April E. Mendoza, MD, MPH*, Martin Rosenthal, MD,
Noelle Saillant, MD*, Peter Fagenholz, MD, David King, MD,
George Velmahos, MD, PhD, MSEd, Haytham Kaafarani, MD, MPH*
Massachusetts General Hospital

Presenter: Charlie Nederpelt, BSc

Discussant: Mark Seamon, MD, University of Pennsylvania

Objectives: We sought to quantify the cumulative and independent impact of transfusion within the first 24 hours of admission on the risk of infection in trauma patients.

Methods: Using the Trauma Quality Improvement Program 2013-2016 database, we included all patients who received blood transfusion in the first 4 hours. Patients who died within 48 hours, were transferred from another hospital, or had incomplete information on transfusion volume were excluded. Patients were divided into 20 cohorts based on the total blood product volume transfused in the first 24 hours. A composite infection variable (INF) was created (e.g. surgical site infection, pneumonia, sepsis). Univariate and stepwise multivariable logistic regression analyses were performed to study the relationship between blood transfusion and INF, controlling for demographics (e.g. age, gender), comorbidities (e.g. cirrhosis, diabetes, steroid use), injury severity [e.g. vital signs, mechanism, injury severity scale (ISS)], and operative and angiographic interventions.

Results: Of 1,002,595 patients, 40,829 met inclusion criteria. The mean age was 42+19 years, 75% were males, 68% had blunt trauma, and the mean ISS was 25 [17-34]. The figure shows the multivariable analyses describing the independent relationship between total blood product transfusion volume and INF. The odds ratio of INF increased incrementally from 1.23 (95% CI: 1.11-1.37) for 2 units transfused to 4.89 (95% CI: 2.72-8.80) for 40 units transfused. Each additional unit increased the odds of INF by 4.9%.

Conclusions: Controlling for relevant confounders, transfusion of the bleeding trauma patient comes at the expense of a dose dependent increased risk of infectious complications. Trauma surgeons and anesthesiologists should resuscitate the trauma patient until prompt hemorrhage control while avoiding overtransfusion.

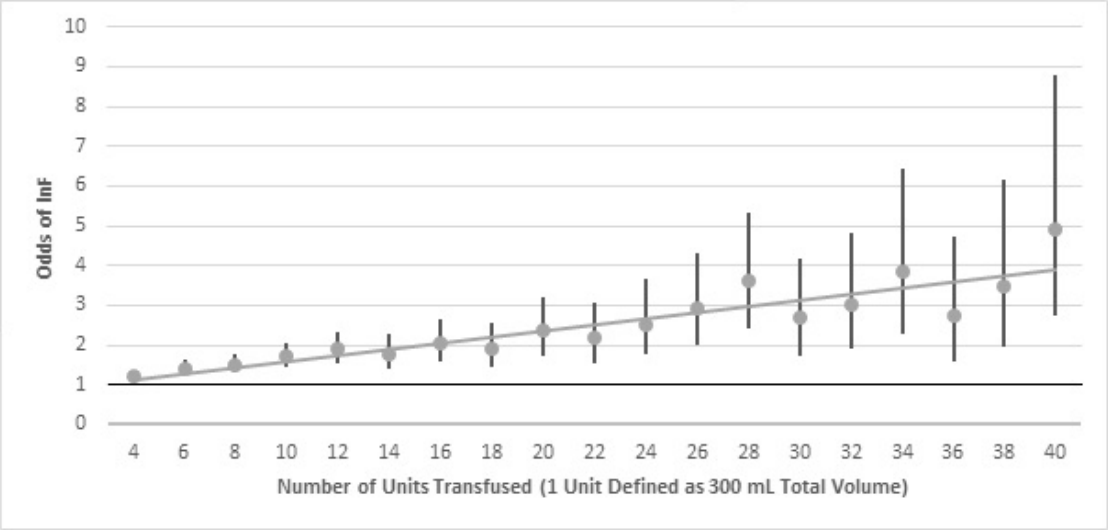


Figure: The relationship between blood transfused and infectious complications.

Paper #27
January 17, 2020
9:05 am

MASSIVE TRANSFUSION AND THE RESPONSE TO PREHOSPITAL PLASMA: IT IS ALL IN HOW YOU DEFINE IT

Edward Sim, BS, Frank Guyette, MD, MPH, Mark Yazer, MD, Joshua B. Brown, MD, MSc*, Matthew Neal, MD, Brian Zuckerbraun, MD, Brian J. Daley, MD, MBA*, Richard S. Miller, MD*, Jeffrey A. Claridge, MD, MS, FACS*, Herb A. Phelan III, MD, FACS*, Brian G. Harbrecht, MD*
University of Pittsburgh Medical Center

Presenter: Edward Sim, BS

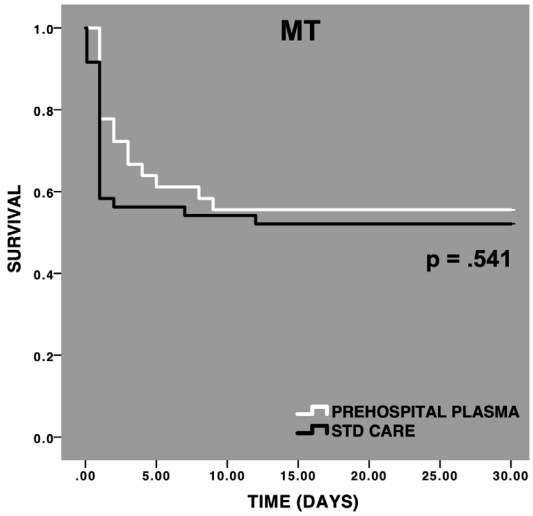
Discussant: John Harvin, MD, McGovern Medical School at UT Health

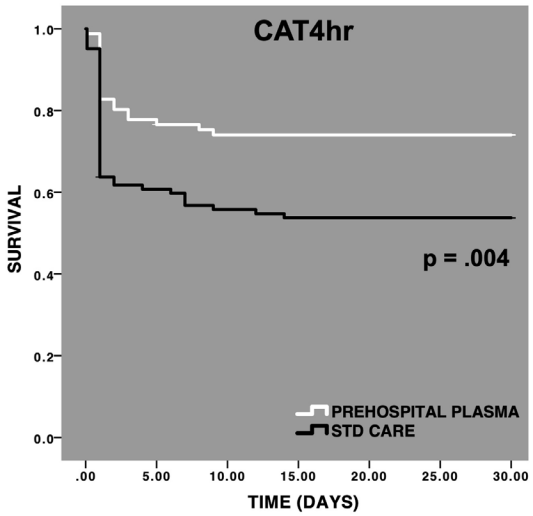
Objectives: The definition of massive transfusion following traumatic injury has evolved over time to minimize bias and predict those at highest risk of death. We sought to characterize different definitions of massive transfusion, their associated mortality risks and the response to prehospital plasma.

Methods: A secondary analysis was performed using data from a recent prehospital plasma trial. Patients transferred directly from the scene were characterized. We defined historical massive transfusion (hMT) using ≥ 10 units red cells/24 hours and critical administration threshold (CAT) as ≥ 3 u/hour in the first hour (CAT1hr) or in the first 4 hours (CAT4hr) from arrival. The primary outcome was 30-day mortality. Kaplan-Meier analysis and Cox hazard regression were used to characterize the survival benefit of prehospital plasma for each MT definition.

Results: A total of 384 enrolled patients were transferred from the scene and represent the study cohort. Overall, 30-day mortality was 30% with a median ISS of 22. Twenty-two%, 33% and 48% of patients met hMT, CAT1hr and CAT4hr definitions, respectively. Of those who died, 77 patients (26%), 65 patients (25%) and 47 patients (24%) never reached hMT, CAT1hr and CAT4hr thresholds, respectively. CAT4hr had superior sensitivity and specificity and minimized survival bias. Kaplan-Meier survival analysis demonstrated a survival benefit in the patients who were CAT4hr positive with no benefit found for CAT1hr or hMT patients. (Figure) Cox hazard regression verified that for CAT4hr patients, prehospital plasma was associated with an independent survival benefit (HR 0.562, 95% CI 0.322-0.980 p=0.042) after adjusting for confounders.

Conclusions: The current analysis demonstrates the superior utility of the CAT4hr definition with optimization of survival bias while conserving mortality risk prediction. This definition was associated with a prehospital plasma survival benefit and may be the most appropriate definition of MT for studies which focus on hemorrhage shock.


MT
SURVIVAL
1.0
0.8
0.6
0.4
0.2
0.0
p = .541
PREHOSPITAL PLASMA
STD CARE
.00
5.00
10.00
15.00
20.00
25.00
30.00
TIME (DAYS)


CAT4hr
SURVIVAL
1.0
0.8
0.6
0.4
0.2
0.0
p = .004
PREHOSPITAL PLASMA
STD CARE
.00
5.00
10.00
15.00
20.00
25.00
30.00
TIME (DAYS)

Paper #28
January 17, 2020
9:25 am

VITAMIN C IS ASSOCIATED WITH LACTATE CLEARANCE AND SURVIVAL IN SEPSIS

Saskya Byerly, MD*, Joshua Parreco, MD*, Hahn Soe-Lin, MD, MS*, Jonathan Parks, MD*, Eugenia Lee, MD, MPH*, Ilya Shnaydman, MD*, Alejandro Mantero, PhD, D. Dante Yeh, MD, FACS, FCCM*, Nicholas Namias, MBA, MD*, Rishi Rattan, MD*
Ryder Trauma Center, University of Miami Miller School of Medicine

Presenter: Saskya Byerly, MD

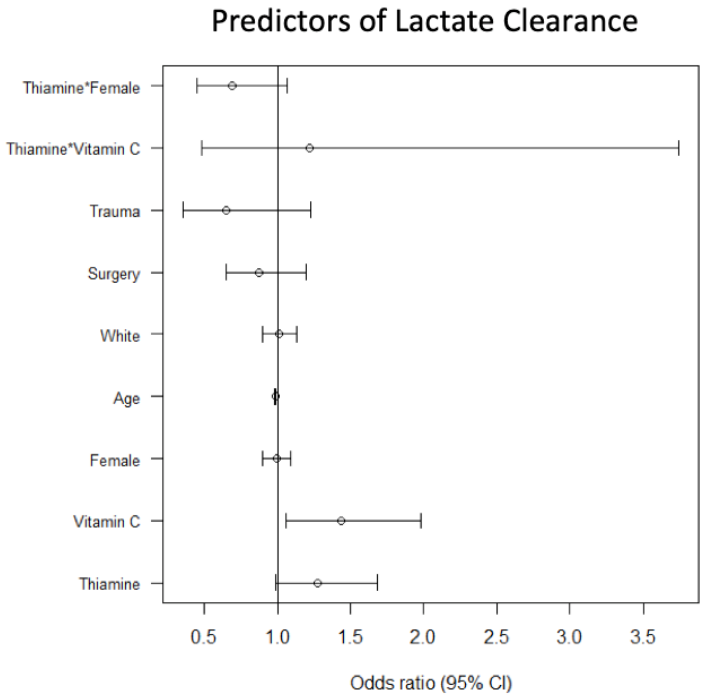
Discussant: Tanya Anand, MD, University of Arizona Tuscon

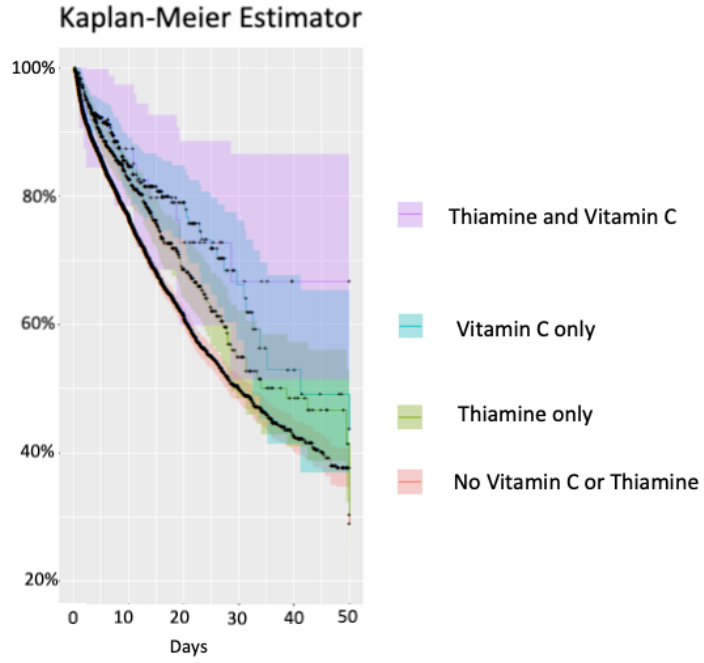
Objectives: The efficacy of vitamin C (vitC) and thiamine (thia) in patients admitted to the intensive care unit (ICU) with septic shock is unclear. The purpose of this study was to evaluate the effect of vitC and thia on mortality and lactate clearance in ICU patients.

Methods: The Philips eICU database version 2.0 was queried for patients admitted to the ICU in 2014-2015 for =48 hours and patients with sepsis and an elevated lactate =2.0 mmol/L. Subjects were categorized according to the receipt of vitC, thia, both, or neither. The primary outcome was in-hospital mortality. Secondary outcome was lactate clearance defined as lactate< 2.0mmol/L achieved after maximum lactate. Univariable comparisons included age, gender, race, Acute Physiology Score III, APACHE IVa score, surgical ICU admission status, intubation status, hospital region, vitC and thia orders. Kaplan-Meier estimators and multivariable logistic regression models were constructed.

Results: Of 146,687 patients from 186 hospitals, 7.7% (n=11,330) were included. Overall mortality was 25.9% (n=2,930) and vitC mortality was 19.6% (n=67,p<0.001). Evidence in favor of an association between vitC and/or thia administration and survival was found on log rank test (all p<0.001). After controlling for confounding factors, vitC was independently associated with decreased mortality (AOR:0.69[0.52-0.90],p=0.007) and lactate clearance (AOR:1.43[1.06-1.98],p=0.023). Older age was also an independent predictor of mortality (AOR:1.02[1.01-1.02],p=0.007) while thia (AOR:1.06[0.85-1.32],p=0.584) and thia*vitC (AOR:1.28 [0.59-2.60],p=0.511) were not. Younger age was an independent predictor of lactate clearance (AOR:0.99[0.98-0.99],p<0.001) while thia (AOR:1.28[0.98-1.68],p=0.074) and thia*vitC (AOR:1.22[0.48-3.74],p=0.698) did not reach significance.

Conclusions: VitC is associated with lactate clearance and increased survival in septic ICU patients. Randomized, multicenter trials are needed to better understand the effect of vitC on outcomes.


Predictors of Lactate Clearance
Thiamine*Female
Thiamine*Vitamin C
Trauma
Surgery
White
Age
Female
Vitamin C
Thiamine
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Odds ratio (95% CI)


Kaplan-Meier Estimator
100%
80%
60%
40%
20%
0
10
20
30
40
50
Days
Thiamine and Vitamin C
Vitamin C only
Thiamine only
No Vitamin C or Thiamine

Paper #29
January 17, 2020
7:45 am

DIAPHRAGM ULTRASOUND: A NOVEL APPROACH TO ASSESSING PULMONARY RESERVE

Sean J. Randazzo, BS, Danielle O'Hara, BS, Sahar Ahmad, MD, Erin Taub, Emily Huang, MS, David Pasternak, BA, James A. Vosswinkel, MD*, Randeep S. Jawa, MD*
Stony Brook University Medical Center

Presenter: Sean J. Randazzo, BS

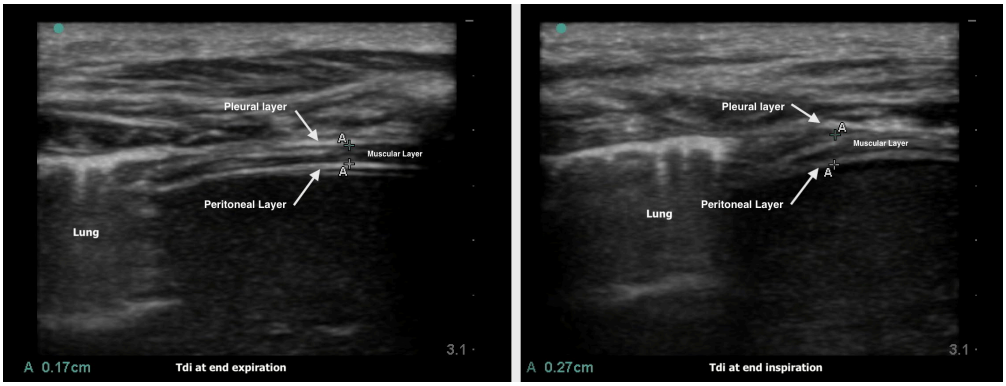
Discussant: Charity Evans, MD, University of Nebraska Medical Center

Objectives: Rib fractures following blunt trauma are a major cause of morbidity. Various factors have been used for risk stratification. In medical patients, ultrasound (US) measurements of diaphragm thickening fraction (TF) have been used to evaluate the diaphragm, i.e. to predict extubation success. However, TF has not been used to assess pulmonary reserve in non-intubated rib fracture patients. Our study aims to measure TF and inspiratory capacity (IC) in the trauma setting to elucidate the association between acute rib fractures and respiratory function.

Methods: This prospective study enrolled adults with acute traumatic rib fractures within 48 hours of admission to a level 1 trauma center. Patients requiring a chest tube or mechanical ventilation were excluded. TF was determined by bedside US measurement of minimum and maximum diaphragm thickness (Tdi) during tidal breathing (Figure 1) and the TF was calculated ($TF= [Tdi_{max}-Tdi_{min}]/Tdi_{min}$). IC was determined via incentive spirometry. Univariate and multivariate analyses were performed.

Results: A total of 42 subjects were enrolled. Subject demographics are outlined in Figure 2. Diaphragm US demonstrated a median TF of 0.30 (IQR 0.24-0.45). Median IC was 1750mL (IQR 1250-2000). Multivariate analysis revealed a significant inverse association between TF and median IC. Neither rib fracture laterality nor level of fracture (ribs 1-6 vs 7-12) was correlated with TF. IC, but not TF, was significantly different (750 vs 1750mL) in those discharged to home vs subacute rehab.

Conclusions: To our knowledge, this is the first report of TF in rib fracture patients. The significant inverse association between TF and IC, and lack of association with discharge disposition, is surprising. The data would argue that in the setting of chest trauma, it is not the diaphragm, but rather other muscles (accessory/chest wall, abdominal muscles) that are the prime determinants of outcome.



Bedside ultrasound of the diaphragm at the zone of apposition

$TF = (Tdi_{max}\text{-}Tdi_{min})/Tdi_{min} = (0.27\text{-}0.17)/0.17 = 0.59$

Characteristic	(n = 42)
Age (years), *median (IQR)*	63 (52-76)
Male sex, *n (%)*	25 (60)
Injury Severity Score, *median (IQR)*	11.5 (10-14)
Rib Fractures, *n (%)*	
Right	22 (52)
Left	17 (40)
Both	3 (7)
Pulmonary Contusions, *n (%)*	6 (14)
Comorbidities, *n (%)*	
Lung Disease (COPD)	1 (2%)
Current smoker	10 (24%)

Patient demographics

Paper #30
January 17, 2020
8:05 am

INFECTIOUS COMPLICATIONS AFTER EMERGENCY GENERAL SURGERY: A STATE-WIDE COLLABORATIVE EXPERIENCE & ASSOCIATION WITH PATIENT CARE MODELS

Kathleen To, MD*, Neil Kamdar, MA, Preethi Patil, MPH, Cathrin Ring, RC, Stacey Collins, MA, Elizabeth Seese, MS, CCRC, Greta Krapohl, PhD, RN, Darrell (Skip) Campbell, Jr., MD, FACS, Michael Englesbe, MD, FACS, Mark R. Hemmila, MD*, Lena M. Napolitano, MD*
University of Michigan

Presenter: Kathleen To, MD

Discussant: Vanessa Ho, MD, MPH, University Hosptials Case Medical Center

Objectives: Emergency General Surgery (EGS) cases are associated with higher morbidity than their elective general surgery counterparts. In the intestinal resection (EGS-IR) cohort, morbidity rate was upwards of 40% in a state-wide Surgical Quality Collaborative (SQC). We performed a comprehensive analysis of patient, hospital & patient care model (PCM) effects on postoperative infectious complications in this high-risk population.

Methods: The state-wide SQC maintains a prospectively collected comprehensive database of patient demographics & 30d outcomes. Thirty-four hospitals in the SQC also provided data on PCM, hospital resources, and surgeon practice patterns. Patient outcomes were examined by surgery type, as well as by PCM (ACS=dedicated Acute Care Surgery team; GSS=General Surgeons covering both elective general surgery & EGS patient care; hybrid=EGS call is shared between the ACS & GSS surgeons). Hierarchical multivariable logistic regression analysis was used to determine risk & reliability adjusted outcomes for postoperative infectious complications.

Results: Between 1/1/08-12/31/16 there were 126,494 general surgery cases performed at these 34 sites (EGS=39,023; EGS-IR=10,431). Overall EGS 30d infectious complications in our SQC cohort was 15.2% (EGS-IR=9.5%). The ACS model was associated with statistically significant decreased infectious complications in the EGS-IR subgroup ($P<0.05$) [Fig 1-2].

Conclusions: We report for postoperative infectious complication rates for the most common EGS procedures in this prospectively collected, research-quality EGS Surgical Quality Collaborative database. EGS-IR patients had the highest rate of complications. We have confirmed that the ACS model is associated with a significant reduction of postoperative infectious complications in the EGS-IR cohort. This represents an area for process of care measures to optimize quality care.

	All Abdominal Procedures N=39,023 (%)	Appendectomy N=14,092 (%)	Cholecystectomy N=10,151 (%)	Gastrectomy N=256 (%)	EGS-IR N=10,431 (%)
SSI - superficial	904 (2.3)	158 (1.1)	63 (0.6)	27 (2.4)	586 (5.6)
SSI - deep	285 (0.7)	50 (0.4)	13 (0.1)	14 (1.3)	178 (1.7)
SSI - organ space	795 (2.0)	210 (1.5)	81 (0.8)	46 (4.1)	417 (4.0)
Pneumonia	1,191 (3.0)	79 (0.6)	105 (1.0)	114 (10.2)	770 (7.4)
Sepsis	1,092 (2.8)	177 (1.3)	102 (1.0)	82 (7.3)	643 (6.2)
Severe Sepsis	1,110 (2.8)	67 (0.5)	84 (0.8)	83 (7.4)	782 (7.5)
UTI	332 (0.9)	27 (0.2)	70 (0.7)	17 (1.5)	186 (1.8)
C Diff	230 (0.6)	30 (0.2)	35 (0.3)	10 (0.9)	127 (1.2)
All Infectious Complications	5,939 (15.2)	798 (2.0)	553 (1.4)	393 (1.0)	3,689 (9.5)

Fig 1. Emergency General Surgery top procedure categories and infectious complication rates

(EGS-IR = Emergency General Surgery Intestinal Resections; SSI = Surgical Site Infection; UTI = Urinary Tract Infection)

	EGS-IR Cohort N=10,431 (%)	ACS model N=1,984 (%)	Hybrid Model N= 1,969 (%)	GSS model N=6,478 (%)	p-value
SSI - superficial	586 (5.6)	124 (6.3)	87 (4.4)	375 (5.8)	0.03
SSI - deep	178 (1.7)	15 (0.8)	58 (3.0)	105 (1.6)	<.0001
SSI - organ space	417 (4.0)	76 (3.8)	54 (2.7)	287 (4.4)	0.003
Sepsis	643 (6.2)	91 (4.6)	194 (9.9)	358 (5.5)	<.0001
Severe Sepsis	782 (7.5)	142 (7.2)	155 (7.9)	485 (7.5)	NS
Pneumonia	770 (7.4)	121 (6.1)	189 (9.6)	460 (7.1)	<.0001
UTI	186 (1.8)	39 (2.0)	34 (2.0)	113 (1.7)	NS
C diff	127 (1.2)	29 (1.5)	17 (0.9)	81 (1.3)	NS

Fig 2. Emergency General Surgery Intestinal Resection (**EGS**-IR) cohort, **bivariate** analysis for outcomes of major infectious complications

(ACS = Acute Care Surgery; GSS = General Surgery Service; SSI = Surgical Site Infection; UTI = Urinary Tract Infection)

Paper #31
January 17, 2020
8:25 am

OBESITY STARTS EARLY AFTER COMBAT AMPUTATION AND COMES WITH THE RISK OF MULTIPLE CO-MORBIDITIES

Robert Conrad, MD, Kelli Ishihara, MD, Dylan Russell, MD, Robert Lim, MD
Tripler Army Medical Center

Presenter: Robert Conrad, MD

Discussant: Stephanie Streit, MD, United States Air Force

Objectives: The Joint Trauma System (JTS) estimates up to 1500 individuals have sustained a combat-related amputation during the Global War on Terror. Anecdotal data shows they may develop obesity and cardiovascular disease, but the incidence of obesity and associated comorbidities in this population is unknown. We sought to determine the prevalence of obesity and obesity related diseases in the military amputee population and to compare this to the general population.

Methods: Retrospective review of the JTS database of 964 combat-related amputation (2001-2015). Data included height, weight, and comorbidities pre and post injuries. Prevalence of obesity and comorbid conditions were determined and compared against the published rates of the United States (RD=rate difference). Kaplan-Meier curves were generated to illustrate onset of obesity and associated comorbidities.

Results: The prevalence of obesity was higher in amputees compared to the general population (55.6% vs. 39.8%). Half of amputees were obese at 6.3 years post-amputation with the majority of these patients having developed obesity at 1.1 years post-amputation. 385 patients were analyzed to determine the prevalence of certain co-morbid conditions. HTN (25% vs 8%; RD 9% to 25%; $p<0.01$), HLD (36% vs 14%; RD 13% to 31.1%; $p = <0.0001$), and OSA (23% vs 8.%; RD 7.1% to 22.%; $p<0.01$) were significantly higher in the obese amputee population. The rates of T2DM, CKD, MDD, and PTSD were not significantly different.

Conclusions: There is an increased prevalence of obesity in the amputee population with median onset of 13 months post injury. HTN, HLP, and OSA exist at a higher rate among obese amputees compared to non-obese amputees. This suggests early aggressive intervention to prevent obesity may also reduce rates of chronic co-morbid medical conditions in the amputee population. Weight gain appears independent of psychiatric disorders. Further analysis of this population may provide insight into the disease of obesity.

Paper #32
January 17, 2020
8:45 am

USE OF GEOGRAPHIC INFORMATION SYSTEMS (GIS) SOFTWARE TO MAP HOTSPOTS FOR PENETRATING INJURIES AND IMPROVE LOCATION SELECTION FOR STOP THE BLEED INTERVENTIONS

Chase Knickerbocker, MD, MHP, Jose Lozada, MD, MS*,
Mario F. Gomez, DO*, Eli Levitt, MS, Ivan Puente, MD*
Broward Health Medical Center

Presenter: Chase Knickerbocker, MD, MHP

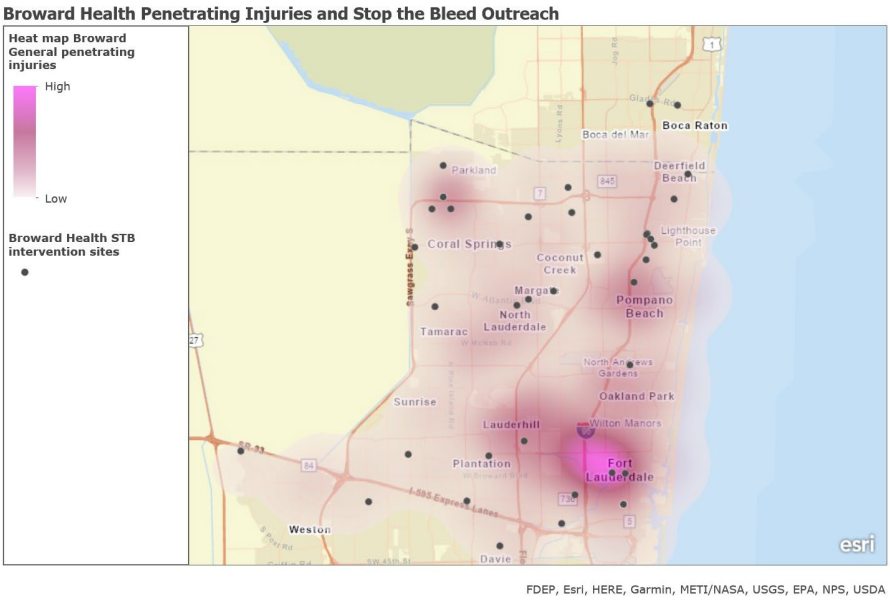
Discussant: Evan Wong, MD, MPH, McGill University

Objectives: The Broward Health Trauma System (BHTS) saw 395 penetrating injuries in 2018, the majority of which were gunshot wounds. BHTS has hosted 105 Stop the Bleed (STB) campaign interventions in 2018. Our goal is to ascertain whether this information is being disseminated effectively by mapping out hotspots for penetrating trauma and cross referencing these with the locations of STB interventions over the same time period.

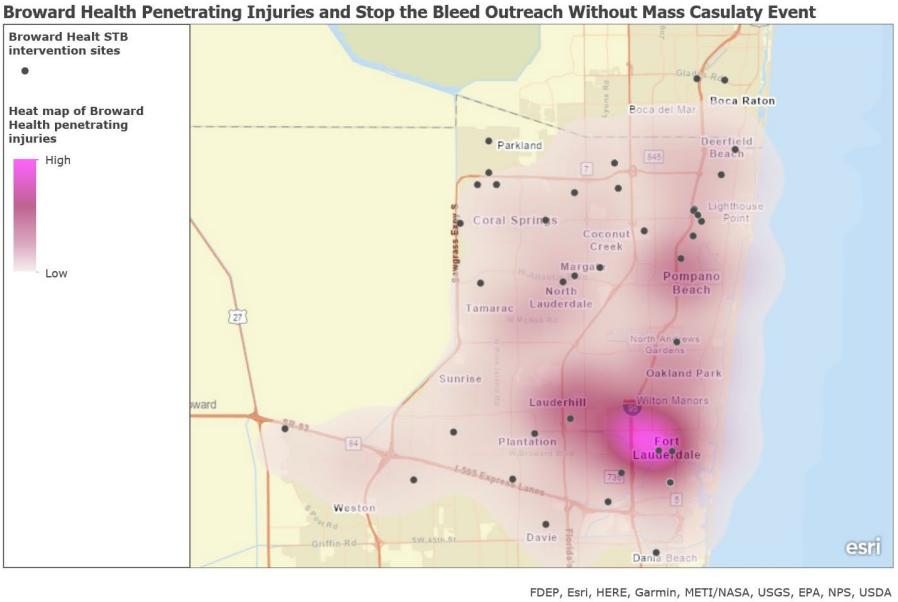
Methods: All penetrating traumas received by the BHTS in 2018 were mapped based on location of incident. These included gunshot wounds, stabbings, bites, and limb severing traumas. Geographic Information Systems (GIS) software was used to create heat maps highlighting areas with the highest concentration of penetrating injuries both with and without a local civilian mass shooting event. STB locations were also mapped out and these maps were superimposed on one another using the software. Buffer and distance analysis of locations were also performed.

Results: Several areas on Map 1 were identified as hot spot. These hot spots were then compared to the locations of STB interventions. After eliminating data from the mass shooting at Stoneman Douglass High School, only 16 of the 105 STB interventions fell within designated hotspots as seen on Map 2. This was defined as interventions within medium intensity areas or higher.

Conclusions: GIS software is a powerful public health tool that can be used to quickly and efficiently map data and perform a variety of statistical analyses. Although over 100 STB interventions were performed by BHTS in 2018, there are clearly areas of increased need within the community that may benefit from more targeted interventions. From this information and the use of statistical analysis, we have identified centralized locations within the hot spots that can act as hosts for future Stop the Bleed interventions.



Map 1. Heat map of penetrating injuries received by the Broward Health Trauma System in 2018. Superimposed map of Stop the Bleed intervention sites within the same year.



Map 2. Heat map of penetrating injuries received by the Broward Health Trauma System in 2018 without those injured in the 2018 Marjory Stoneman Douglass High School civilian mass shooting event. Superimposed map of Stop the Bleed intervention sites within the same year.

Paper #33
January 17, 2020
9:05 am

DO EARLY NON-STEROIDAL ANTI-INFLAMMATORY DRUGS FOR ANALGESIA WORSEN ACUTE KIDNEY INJURY AFTER SEVERE TRAUMA? A PROPENSITY SCORE ANALYSIS

Gabrielle E. Hatton, MD, Cynthia Bell, MS, Shuyan Wei, MD,
Charles E. Wade, PhD, Lillian Kao, MD MS, John A. Harvin, MD*
University of Texas Health Science Center at Houston

Presenter: Gabrielle E. Hatton, MD

Discussant: Zaffer Qasim, MBBS, Perelman School of Medicine at the Univ. of Pennsylvania

Objectives: Non-steroidal anti-inflammatory drugs (NSAIDs) are a class of opioid-sparing analgesics used in multimodal pain regimens. However, they may worsen acute kidney injury (AKI) given concomitant risk factors such as hypovolemia. We aimed to determine if early NSAID exposure is associated with worsened AKI after severe trauma.

Methods: A cohort study of adult (=16 years) trauma intensive care unit patients with =1 rib fractures and surviving >24 hours between 2010 and 2017 was performed. Early NSAID exposure was defined as receipt of =1 dose within 48 hours of admission. The primary outcome was AKI upstage or death within 7 days; AKI upstage was defined as an increase in AKI stage as defined by the KDIGO guidelines. Secondary outcomes were AKI upstage, AKI-free days, and death. Propensity for early NSAIDs was calculated by logistic regression and nearest neighbor matching was performed in a 1:4 ratio (early NSAIDs: controls). Frequentist and Bayesian analyses were performed, including sensitivity analyses utilizing NSAID doses in lieu of exposure.

Results: Of 2,490 patients, 271 administered early NSAIDs were matched to 1,084 controls. Most patients were male (72%) with a median injury severity score of 22 and a median age of 46 years. The control group had a higher incidence of the primary outcome (20% vs 15%, p=0.08) and death (10% vs 4%, p=0.01), but AKI upstage was similar between groups (15% vs 14%, p=0.80). On frequentist analyses, neither early NSAID exposure nor number of NSAID doses were associated with primary or secondary outcomes (**Figure**). Early NSAIDs were associated with a lower mortality on Bayesian analyses (**Table**).

Conclusions: In this study, early NSAID exposure was not associated with AKI upstage or fewer AKI-free days. This finding must be further investigated as selection bias was possible, given the mortality discrepancy between the two groups.

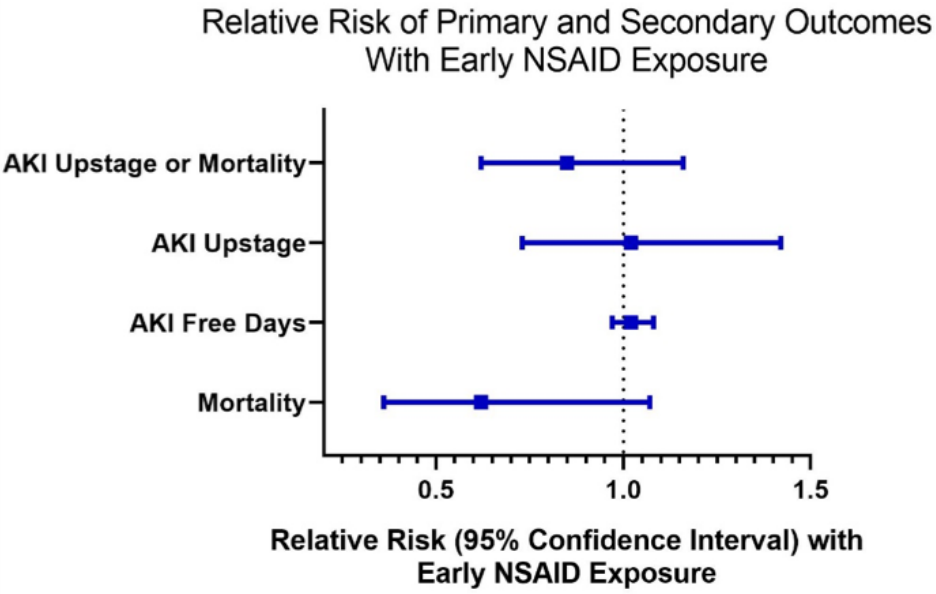


Figure: Frequentist Analyses Results

	Relative Risk with Early NSAID Exposure (95% Credible Interval)	Posterior Probability that Early NSAIDs Increases Outcome
Upstage or Mortality	0.77 (0.56-1.05)	5%
AKI Upstage	0.94 (0.67-1.28)	35%
AKI Free Days	1.00 (0.94-1.05)	45%
Mortality	0.54 (0.28-0.89)	<1%

Table: Bayesian Analyses Results

Paper #34
January 17, 2020
9:25 am

SIMULATION-BASED OBJECTIVE STRUCTURED CLINICAL EXAMINATION (OSCE) FOR THE EVALUATION AND TRAINING OF ADVANCED SURGICAL SKILLS IN TRAUMA

Pablo Achurra, MD, Juan Pablo Ramos, MD, Rolando Rebolledo, MD, PhD,
Martin Inzunza, MD, Jose Quezada, MD, Rodrigo Tejos, MD,
Pablo Ottolino, MD, Julian Varas, MD
Pontificia Universidad Catolica de Chile

Presenter: Pablo Achurra, MD

Discussant: Hee Soo Jung, MD, University of Wisconsin

Objectives: To describe and validate a novel objective structured clinical examination (OSCE) for the training and evaluation of advanced surgical skills in trauma.

Methods: We developed an OSCE with 6 stations for the evaluation and training of basic and advanced surgical skills based on simulation, all stations used real animal tissue. 1. Basic knots and sutures; 2. Bowel resection and anastomosis (bovine bowel); 3. Vascular end-to-end anastomosis (5mm perfused blood vessels); 4. Lung injury repair (ventilated ex-vivo porcine model) 5. Cardiac injury repair (porcine ex-vivo perfused and pumping heart model); 6. Laparoscopic suturing of bowel injury.

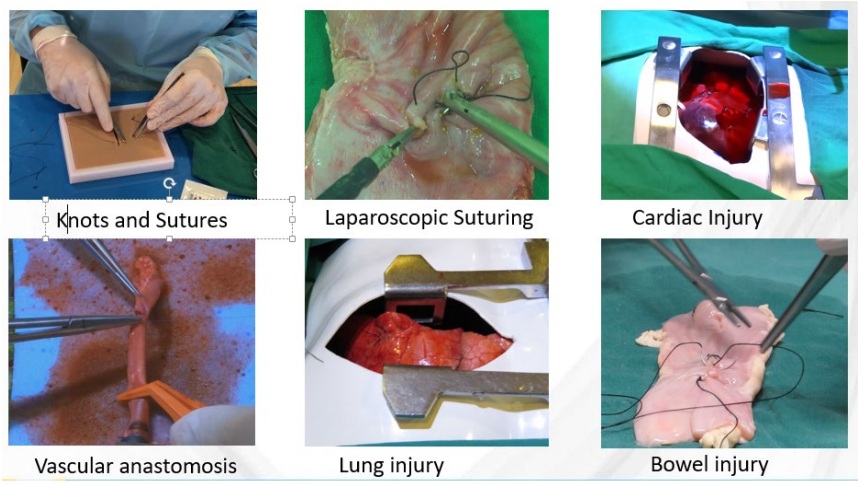
Participants had 20 min in each station to complete the procedure objectives. All procedures were video recorded and later blindly evaluated by experts using validated general and specific rating scales (OSATS). Participants were helped by a passive assistant in each station. OSATS max. score was 25 for each station (150 for the complete OSCE).

Results: Eight postgraduate year 2 (PY-2); 8 recently graduated surgeons (RGS) and 3 experts were assessed in each station.

Significant differences were identified between groups. Average OSATS were 82 for PY2, 113 for RGS and 147 for experts ($p<0.01$). Average procedure time was 98 minutes for PY2, 79 minutes for RGS and 53 minutes for expert surgeons ($p<0.01$).

Minor differences were identified in basic knots and sutures station but mayor differences were identified in the vascular and cardiac injury stations. Average OSATS in vascular anastomosis were 12 (range: 10-15); 18 (12-20) and 24 (24-25) for PY-2, RGS and experts respectively. In cardiac injury, average OSATS were 10 (8-15); 20 (18-22) and 25 respectively.

Conclusions: Advanced surgical trauma skills can be efficiently evaluated through a standarized OSCE using ex-vivo tissue based simulation stations.



OSCE stations

Quick Shot #1
January 16, 2020
9:00 am

BRAIN INJURY GUIDELINES - MODIFIED ADMISSION CRITERIA (BIG-MAC) IMPROVED ACCURACY IN TRIAGE FOR PATIENTS WITH TRAUMATIC BRAIN INJURY

Laura Harmon, MD*, Amanda Louiselle, MD, Erik Peltz, DO, Franklin Lee Wright, MD*, Stephanie Vega, BSN, RN, Lauren Steward, MD*, Catherine Velopulos, MD, MHS, FACS*, Juan Pablo Idrovo, MD*, Lisa Ferrigno, MD, FACS, Maria Albuja Cruz, MD, Christopher Raeburn, MD, Paul Montero, MD, Robert McIntyre, MD
University of Colorado, Aurora

Presenter: Laura Harmon, MD

Objectives: The Brain Injury Guidelines were developed to evaluate which patients with mild and moderate TBI could be safely managed without mandated neurosurgical consultation. We sought to utilize BIG to guide triage of patients for admission to observation, surgical floor and ICU levels of care with associated standardization of resource utilization for monitoring of these patients - Brain Injury Guideline - Modified Admissions Criteria (BIG-MAC). Our objective was to develop admission pathways utilizing BIG criteria to improve accuracy in triage of patients to appropriate levels of care at admission.

Methods: A prospective evaluation for all patients with acute TBI from 08-2017 to 04-2019. BIG-MAC was used to guide admission starting in 07-2108. Indication for admission, consultations, and level of care were guided by the BIG-MAC protocol (table 1). Each patient was graded and stratified on the BIG-MAC criteria for admission to the short-term observation unit (lowest level of care), the general surgical floor or intermediate care unit, or the intensive care unit (table 2).

Results: A total of 460 patients were admitted with TBI (pre-implementation n=221, post implementation n= 239) age 18-96, 68% male. Implementation of the BIG-MAC protocol decreased admissions to the observation unit from 22% to 15% (p=0.05). Unexpected admissions to the ICU from the clinical observation unit decreased from 5 patients to 1 patient (p=0.08) Post implementation, no patients required urgent or emergent operative intervention from the observation or floor unit compared to one patient in the pre-implementation time period.

Conclusions: Developing admission criteria using the BIG resulted in more direct admissions to the ICU and the general surgical floor or intermediate care unit with a reduction in inappropriate admissions to observation.

Table 1: Criteria for admission

	BIG-MAC* 1	BIG-MAC 2	BIG-MAC 3
Initial GCS**	13-15	13-15	Any
Focal neurologic findings	No	No	Yes
Intoxication	No	No/Yes	No/Yes
Anticoagulation/ Antiplatelet agent	No	No	Yes
Skull Fractures	No	Non-displaced	Displaced
Epidural Hematoma	No	No	Yes
Subdural Hematoma	<4mm	4-7.9mm	>8mm
Intra-paranchymal Hemorrhage	<4mm	4.7.9mm	>8mm or multiple
Subarachnoid Hemorrhage	<3sulci <1mm	Single hemisphere 1-3mm	Bi-hemispheric >3mm
Intraventricular Hemorrhage	No	No	Yes
Edema	No	Edema without sulcal or ventricular effacement, shift <1mm	Edema with sulcal or ventricular effacement , shift >1mm
Hospitalization	Emergency Department Observation Unit	Trauma/Acute Care Service	Neurosurgery or Trauma/Acute Care Service

*Brain Injury Guideline-Modified Admission Criteria
**Glasgow Coma Scale

Table 2: Treatment Algorithm

BIG-MAC 1	6 hours in EM observation unit Repeat neurologic assessment by EM physician every 2 hours Patient must have GCS of 15 and no neurologic abnormalities to meet discharge criteria
BIG-MAC 2	Admission to trauma service for observation. 2 hour neuro checks repeat CT head at 6 hours Observe 24-48 hours Neurologic assessment by trauma physician at 6-12 hours and 24 hours. GCS 15, no neurologic abnormalities at time of discharge
BIG-MAC 3	Admission to Trauma or Neurosurgery 1-2 hour neuro checks Neurologic assessment by trauma physician at 6-12 hours and 24 hours

Quick Shot #2
January 16, 2020
9:06 am

NATIONWIDE ANALYSIS OF WHOLE BLOOD HEMOSTATIC RESUSCITATION IN CIVILIAN TRAUMA

Kamil Hanna, MD, Michael Ditillo, DO, FACS*, Mohammad Chehab, MD,
Lourdes Castanon, MD*, Samer Asmar, MD, Lynn Gries, MD,
Andrew L. Tang, MD*, Bellal Joseph, MD*
The University of Arizona

Presenter: Kamil Hanna, MD

Objectives: Renewed interest in whole blood (WB) resuscitation in civilians has emerged following its military use. There is a paucity of data on its role in civilians where balanced component therapy (CT) is the standard of care. The aim of this study is to evaluate the outcomes of WB resuscitation in civilian trauma patients. We hypothesized that WB is associated with improved outcomes

Methods: We analyzed the (2015-2016) Trauma Quality Improvement Program. We included adult (age=18y) trauma patients who received CT within 4-hrs of admission. Patients were stratified: those who received WB+CT and those who received only CT. Primary outcomes were 24-hour and in-hospital mortality. Secondary outcomes were major complications, and length of stay. Multivariable logistic regression was performed adjusting for demographics, vitals, injury parameters, comorbidities, and trauma center level

Results: A total of 8,494 patients were identified of which 280 received WB +CT (WB 1[1-1], PRBC 12[7-19], FFP 7[4-14], Platelets 2[1-3]) and 8,214 received CT only (PRBC 7[4-15], FFP 4[2-9], Platelets 1[0-2]). Mean age was 36+/-18y, 74% were male, ISS was 24[14-34], and 18% had penetrating injuries. Patients who received WB+CT had a lower 24-hour mortality (17% vs. 25%; p=0.02), in-hospital mortality (29% vs. 40%; p=0.01) **Figure1**, major complications (29% vs. 41%; p=0.01) and a shorter length of stay (9[7-12] vs. 15[10-21]; p=0.01). On regression analysis, WB was independently associated with reduced 24-hour (OR 0.65[0.47-0.87];p=0.01), in-hospital mortality (OR 0.82[0.76-0.89];p=0.01), and major complications (OR 0.91[0.80-0.97];p=0.01)

Conclusions: The use of WB as an adjunct to CT is associated with improved survival compared to CT alone in resuscitation of severely injured civilian trauma patients. Further studies are required to evaluate the role of adding WB to massive transfusion protocols.

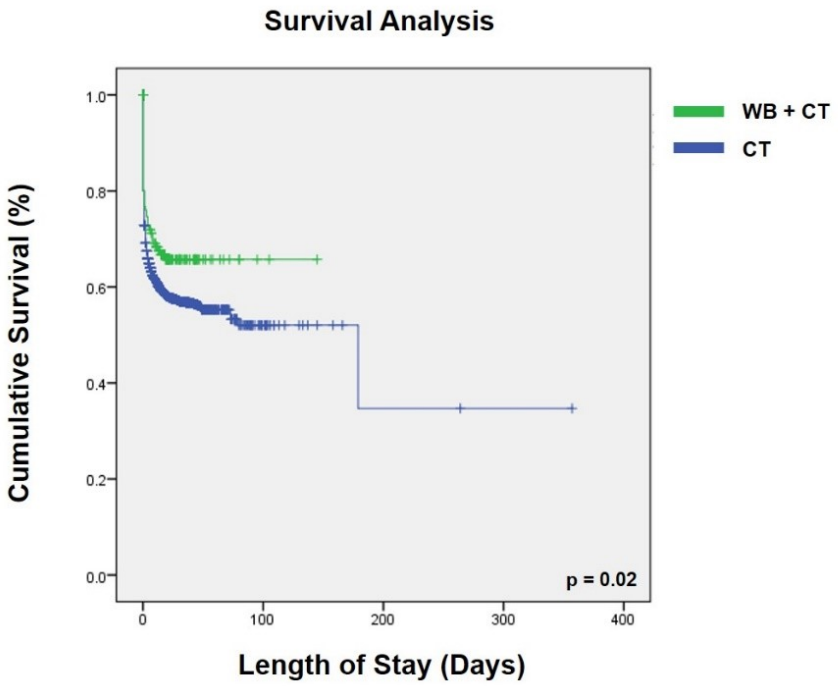


Figure 1: Kaplan Meier Survival Analysis

Quick Shot #3
January 16, 2020
9:12 am

GETTING BETTER WITH TIME? A TEMPORAL ANALYSIS OF THE AORTA REGISTRY

Marko Bukur, MD, FACS*, Elizabeth Warnack, MD, Charles DiMaggio, PAC, PhD,
Spiros Frangos, MD, MPH, Jonathan J. Morrison, MRCS,
Thomas M. Scalea, MD, FACS, FCCM*, Laura J. Moore, MD*,
Jeanette Podbielski, RN, CCRP, Kenji Inaba, MD, David Kauvar, MD,
Jeremy W. Cannon, MD, SM, FACS*, Mark J. Seamon, MD, FACS*,
M. Chance Spalding, DO, PhD*, Charles Fox, MD, Joseph J. DuBose, MD*
Bellevue Hospital Center

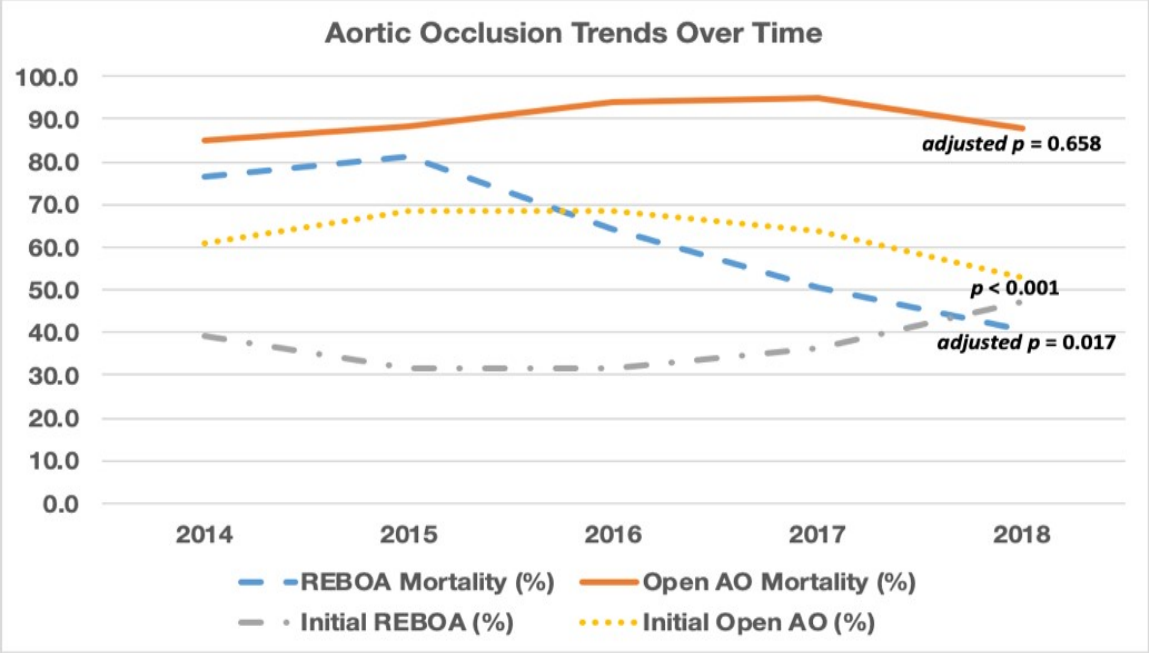
Presenter: Marko Bukur, MD, FACS

Objectives: Aortic occlusion (AO) is utilized for patients in extremis, with resuscitative endovascular balloon occlusion of the aorta (REBOA) use increasing. Our objective was to examine changes in AO practices and outcomes over time. The primary outcome was the temporal and procedural variation in AO mortality, while secondary outcomes included changes in technique, utilization, and complications.

Methods: This study examined the AORTA registry over a 5-year period (2014-2018). AO outcomes and utilization were analyzed using year of procedure as an independent variable. A multivariable model adjusting for year of procedure, type of AO, signs of life (SOL), SBP at AO initiation, operator level, timing of AO, and hemodynamic response to AO was created to analyze AO mortality.

Results: 1458 AO were included. Mean age (39.1+/-16.7) and Median ISS (34[25,49]) were comparable between REBOA and Open AO. Open AO patients were more likely: male (84% vs. 77%, p=0.001), s/p penetrating trauma (61% vs. 19%, p<0.001), and arrived without SOL (60% vs. 40%, p<0.001). REBOA use increased significantly and adjusted mortality decreased 23%/year while open AO survival was unchanged (Figure). REBOA was associated with reduced mortality compared to open AO (AOR 0.4, adj p <0.001). REBOA initiation SBP increased significantly over the study period (52.2 vs. 65, p=0.04). Compared with patients undergoing AO with CPR, each decile increase in SBP improved survival 14% (AOR 1.14, adj p<0.001). The use of 7F REBOA (2.9% to 54.8%) and Zone III deployment increased significantly (14.7% vs 40.6%), with Zone III placement having decreased associated mortality (AOR 0.33, adj p<0.001). Overall REBOA complication rate was 4.5% and did not increase over time (p=0.880).

Conclusions: REBOA survival has increased significantly over time compared to open AO. This may be related to increased operator experience and improved catheter technology leading to earlier deployment.


Aortic Occlusion Trends Over Time
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
2014
2015
2016
2017
2018
adjusted p = 0.658
p < 0.001
adjusted p = 0.017
REBOA Mortality (%)
Open AO Mortality (%)
Initial REBOA (%)
Initial Open AO (%)

Quick Shot #4
January 16, 2020
9:18 am

BLUNT CEREBROVASCULAR INJURY SCREENING CRITERIA SHOULD INCLUDE HIGH SPEED MOTOR VEHICLE CRASHES

Ashley Farhat-Sabet, BS, Margaret H. Lauerman, MD*, Alicia Chavez, BS, Joseph Lloyd, BS, Thomas M. Scalea, MD, FACS, FCCM*, Deborah M. Stein, MD, MPH, FACS, FCCM*,
R Adams Cowley Shock Trauma Center, University of Maryland School of Medicine

Presenter: Ashley Farhat-Sabet, BS

Objectives: Motor vehicle collisions (MVCs) are the leading cause of blunt cerebrovascular injury (BCVI). Current screening criteria miss 30% of BCVI. Understanding mechanisms of BCVI formation may improve screening criteria.

Methods: We performed a retrospective review of the Crash Injury Research and Engineering Network (CIREN) database. We identified approximate BCVI injury screening criteria (diffuse axonal injury with Glascow Coma Scale <6, cervical spine fracture, Lefort II/III fracture, and basilar skull fracture) as able in the CIREN database. We hypothesized MVC variables explaining mechanism of BCVI formation would be more common in BCVI without injury screening criteria.

Results: 93 BCVIs were included, with 37/93 (39.8%) without injury screening criteria. There was a significant difference in the mean change in velocity (51.00 km/h vs. 30.78 km/h, $p<0.001$), but not mean force direction from 12 o'clock (22.50 vs. 29.02 degrees, $p=0.35$) between BCVI without screening criteria and BCVI with screening criteria. BCVI without injury screening criteria had no increase in ejection (8.1% vs. 7.1%, $p=1.00$), submarining (5.7% vs. 3.6%, $p=0.64$), rollover (10.8% vs. 28.6%, $p=0.07$) or intrusion (32.4% vs. 48.2%, $p=0.14$). BCVI without injury screening criteria more commonly had seatbelt position snug across the hips (94.6% vs. 74.5%, $p=0.01$) and pretensioner deployment (92.6% vs. 70.2%, $p=0.04$). In drivers only, BCVI without injury screening criteria more commonly had steering wheel airbag deployment (89.7% vs. 68.9%, $p=0.05$) and airbag contact (77.3% vs. 62.8%, $p=0.28$).

Conclusions: BCVI without injury screening criteria occurred during higher speed collisions with similar crash types, and had more frequent and appropriate safety device use, supporting crash deceleration and subsequent neck flexion/extension as a potential cause of BCVI. BCVI screening criteria should include high-speed motor vehicle crashes.

Quick Shot #5
January 16, 2020
9:24 am

CONTEMPORARY MANAGEMENT OF TRAUMATIC ESOPHAGEAL INJURIES: THE RESULTS OF AN EASTERN ASSOCIATION FOR THE SURGERY OF TRAUMA MULTI-INSTITUTIONAL STUDY

Lauren Raff, MD*, Bryce R.H. Robinson, MD, MS, FACS, FCCM*,
Jeffry Nahmias, MD, MHPE, FACS*, Jacquelyn Phillips, MD, Matthew R. Noorbakhsh, MD*,
Nikolay Bugaev, MD*, Kokila Jeyamurugan, Jose L. Pascual, MD, PhD, FRCS(C), FACS*,
Andrew Young, MD, FACS*, Eric A. Schinnerer, MD*, Eric M. Campion, MD*,
Lewis E. Jacobson, MD, FACS*, Sigrid Burruss, MD, FACS,
Syed Saquib, MD*, Patrick L. Bosarge, MD*
University of North Carolina

Presenter: Lauren Raff, MD

Objectives: Traumatic esophageal perforation is rare and there is substantial variability in the way that these injuries are managed, ranging from a completely non-operative approach to aggressive operative management. The purpose of this study was to evaluate the management of traumatic esophageal injury and compare the different management strategies that are being used for this population.

Methods: This is an Eastern Association for the Surgery of Trauma multi-institutional retrospective study from 2011 to 2017 of all patients who sustained a traumatic esophageal injury and were admitted to one of the 11 participating centers. Demographics, mechanism, location, and management of the esophageal injury were collected. The primary outcome was esophageal leak after initial management.

Results: After exclusions, there were 51 patients in the cohort. Esophageal injuries were cervical in 69% and thoracic in 31%. Most patients were managed with operative repair as their initial intervention (61%), followed by no intervention (19%), esophageal stenting (10%), and wide local drainage (10%). Compared to patients who underwent direct operative repair, patients managed with esophageal stenting had an increased rate of esophageal leak (22% vs 80%, $p = 0.0231$). Patients with a blunt mechanism of injury had a higher overall complication rate versus penetrating mechanisms (100% vs 27%, $p = 0.0004$), however mortality was not significantly different (14% vs 9%, $p = 0.53$).

Conclusions: Most patients with esophageal injuries undergo direct repair of the injury with lower rates of postoperative leaks. While few patients develop esophageal injury from blunt trauma, the overall complication rate is high. This study suggests that patients who have esophageal injury may be best managed by direct operative repair and not esophageal stenting.

Quick Shot #6
January 16, 2020
9:30 am

DIRECT TO OPERATING ROOM TRAUMA RESUSCITATION: OPTIMIZING PATIENT SELECTION AND TIME-CRITICAL OUTCOMES WHEN MINUTES COUNT

Amelia Johnson, PA-C, Andrea Kuchler, PA-C, Emma Williams, PA-C, Michael Rott, PA-C, Frederic J. Cole Jr., MD*, Ameen I. Ramzy, MD, MBA, FACS*, Ronald Barbosa, MD*, William Long, MD, Matthew J. Martin, MD, FACS*
Legacy Emanuel Medical Center

Presenter: Amelia Johnson, PA-C

Objectives: Although several trauma centers have developed "direct to OR" (DOR) trauma resuscitation programs, there is little published data on optimal patient selection, practices, and outcomes. We sought to analyze triage criteria and interventions associated with optimal DOR outcomes and resource utilization.

Methods: Retrospective review of all adult DOR resuscitations over a 6-year period. Triage criteria were analyzed individually, and grouped into categories: mechanism, physiology, anatomy/injury, or other. The best univariate and multivariate predictors of requiring lifesaving interventions (LSI) or emergent surgery (ES) were analyzed. Actual and predicted mortality (pM) were compared for all patients and for pre-defined time-sensitive subgroups.

Results: There were 628 DOR patients (5% of all admissions) identified; the majority were male (79%), penetrating mechanism (70%), severely injured (40% ISS>15), and 17% died. Half of patients required LSI and 23% required ES, with significantly greater need for ES and lower need for LSI after penetrating versus blunt injury ($p<0.01$). Although injury mechanism criteria triggered most DOR cases and best predicted need for ES, the physiology and anatomy/injury criteria were associated with greater need for LSI, and mortality (Table). Observed mortality was significantly lower than pM with DOR for several key subgroups (Figure). Triage schemes for both ES and LSI could be simplified to 4-6 independent predictors by regression analysis.

Conclusions: The DOR program accurately identified severely injured trauma patients at high risk for requiring LSI and/or ES. Injury Different triage variable categories drive the need for ES versus LSI and could be simplified and optimized to a 4-6 variable triage scheme. DOR was associated with better than expected survival among specific time-sensitive sub-groups.

Triage Variable categories:	% of DOR cases*	LSI*	Emerg Surg*	Mortality*
1. Mechanism	64%	42%	24%	7%
2. Physiology/exam	21%	68%	24%	45%
3. Anatomy/injury	7%	67%	27%	16%
4. Other	8%	45%	4%	28%

*all P<0.01; LSI = lifesaving interventions

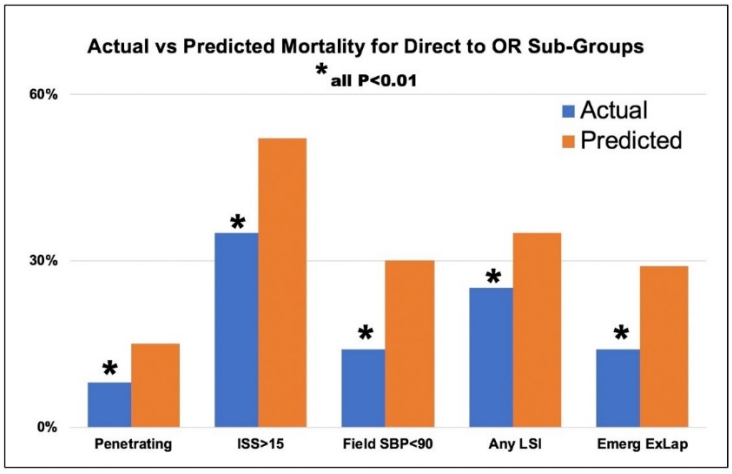


Table showing the DOR triage variable categories and association with interventions and mortality. Figure showing actual versus predicted mortality for DOR time-sensitive sub-groups.

Quick Shot #7
January 16, 2020
9:36 am

THERAPEUTIC ANTICOAGULATION IN PATIENTS WITH TRAUMATIC BRAIN INJURIES AND PULMONARY EMBOLI

Amanda M. Chipman, MD, Jason Radowsky, MD*, David Chow, BS,
Gary Schwartzbauer, MD, Ronald B. Tesoriero, MD*,
Deborah M. Stein, MD, MPH, FACS, FCCM*
R Adams Cowley Shock Trauma Center, University of Maryland School of Medicine

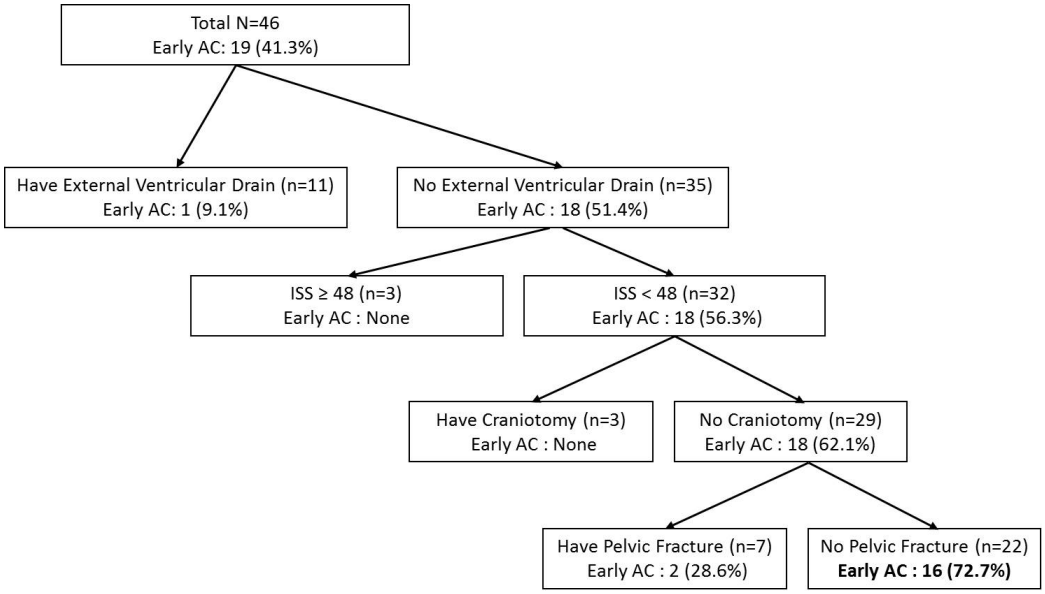
Presenter: Amanda M. Chipman, MD

Objectives: Patients with traumatic intracranial hemorrhage (ICH) and concomitant pulmonary embolus (PE) have competing care needs and demand a careful balance of anticoagulation (AC) versus potential worsening of their ICH. The goal of this study is to determine the safety of AC for PE in patients with ICH.

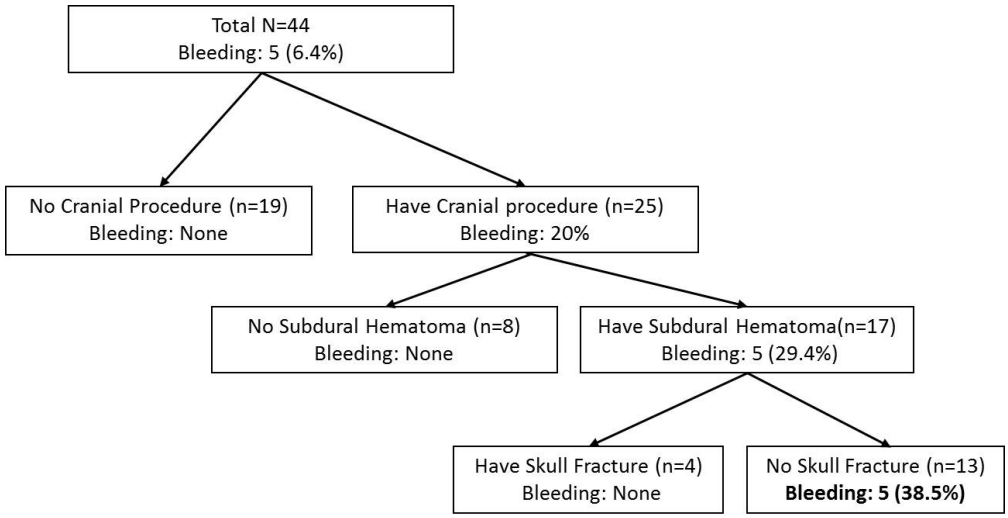
Methods: This is a retrospective single center study of patients >16 years old with concomitant ICH and PE occurring between June 2013 and December 2017. Early AC was defined as within =7 days of injury; late was defined as after 7 days. Primary outcomes included death, interventions for worsening ICH following AC, and pulmonary complications. Multivariate logistic regression was used to evaluate for clinical and demographic factors associated with worsening traumatic brain injury (TBI), and recursive partitioning was used to differentiate risk in groups.

Results: Fifty patients met criteria. Four did not receive any AC and were excluded. Nineteen (41.3%) received AC early (median 4.1, IQR 3.1-6.0) and 27 (58.7%) received AC late (median 14.0, IQR 9.7-19.5). There were 4 deaths in the early group, and none in the late cohort (21.1% vs. 0%, p=0.02). Two deaths were due to PE and the others were from multi-system organ failure or unrecoverable underlying TBI. Three patients in the early group, and 2 in the late, had increased ICH on CT (17.6% vs. 7.4%, p=0.3). None required intervention.

Conclusions: This retrospective study failed to find instances of clinically significant progression of TBI in 46 patients with CT-proven ICH after undergoing AC for PE. AC is not associated with worse outcomes in patients with TBI, even if initiated early. However, 2 patients died from PE despite AC, underlining the severity of the disease. ICH should not preclude AC treatment for PE, even early after injury.



Classification and Regression Tree (CART) Model for Early AC. Patients without an external ventricular drain (EVD), Injury Severity Score (ISS) <48, no craniotomy, and no pelvic fracture had a 72.7% chance of early AC.



CART Model for Bleeding. The highest risk of bleeding (increased ICH on CT scan) was in patients with cranial procedures, subdural hematomas and no skull fracture (38.5%).

Quick Shot #8
January 16, 2020
9:42 am

MASSIVE TRANSFUSION WITH WHOLE BLOOD IS SAFE COMPARED TO COMPONENT THERAPY

Jared Gallaher, MD, MPH*, April Cockcroft, DO, Maverick Grey, Elizaebth Dewey, MS, Andrew Goodman, BA, Chris Freeman, MD, Martin A. Schreiber, MD, FACS*
Oregon Health and Science University

Presenter: Jared Gallaher, MD, MPH

Objectives: Transfusion with uncrossmatched cold-stored low-titer group O positive or negative whole blood in civilian trauma has been investigated as an alternative to component therapy but only in limited volumes. To our knowledge, this is the first analysis of the safety and efficacy of massive transfusion of trauma patients with whole blood.

Methods: This is a retrospective cohort analysis comparing trauma patients resuscitated with component therapy (COMP) versus component therapy plus whole blood (WB). The COMP group was comprised of patients who presented from 01/2017 through 06/2018 and the WB group from patients who presented from 07/2018 through 01/2019 after WB became available. 20 units of whole blood were available weekly and stored up to 2 weeks. We included patients if they received 1 unit of WB or red blood cells (RBCs) within 24 hours of admission and had a MTP activated. We used bivariate analysis to compare groups. For analysis, one unit of whole blood equaled 1 unit of RBCs, 1 unit of fresh frozen plasma, and 1/6 of a unit of apheresis platelets.

Results: 42 patients received WB and 83 patients received COMP with similar baseline characteristics. Patients had a median age of 41 years (IQR 28, 61) and 73% were male. 30% had penetrating injuries with a median ISS of 29 (IQR 17, 38). The WB group received a median of 6.5 units (IQR 3, 11) of WB along with component units listed in Table 1.The WB group received significantly more component-equivalent units but with a plasma:RBC ratio of 0.94:1 compared to 0.8:1 ($p<0.001$). There were no differences in 24-hour mortality (COMP 22% vs WB 26%, $p=0.6$) or 30-day mortality (COMP 43% vs WB 52% $p=0.3$). There were no transfusion reactions.

Conclusions: Massive transfusion utilizing primarily whole blood in civilian trauma is feasible. It appears to be a safe and effective addition to component therapy and may lead to a more balanced resuscitation but with more overall product used.

Units of Blood Products Administered Median (IQR)	Component Therapy (COMP)	Whole Blood (WB)	*p* value
Whole Blood Units	-	6.5 (3, 11)	-
Red Blood Cells (RBCs)	6 (3, 12)	4 (1, 8)	0.003
Fresh Frozen Plasma (FFP)	5 (2, 10)	4 (0,6)	0.01
Platelets	0 (0, 2)	1 (0, 2)	0.2
Cryoprecipitate	0 (0, 0)	0 (0,0)	0.9
Total Component-Equivalent Units of Product Administered	12 (5, 24)	27 (13, 41)	<0.001
Plasma:RBC Ratio	0.8:1	0.94:1	<0.001

Units of blood products administered within 24 hours of presentation by cohort

Quick Shot #9
January 16, 2020
9:48 am

THE IMPACT OF ANTIPLATELET (AP) AND ANTICOAGULANT(AC) AGENTS ON OUTCOMES IN GERIATRIC PATIENTS WITH TRAUMATIC BRAIN INJURY (TBI)

Jennifer Albrecht, PhD, Mira Ghneim, MD*, Karen Brasel, MD,
Anna Liveris, MD*, Jill Watras, MD*, James M. Haan, MD*, Robert D. Winfield, MD, FACS*,
Sasha D. Adams, MD*, Scott B. Armen, MD, FACS, FCCM*, Fady Nasrallah, MD*,
Julie A. Dunn, MS, MD*, Thomas J. Schroeppel, MD*, Zara Cooper, MD, MSc*,
Jason Murry, MD, Matthew E. Lissauer, MD*, Kaveh Najafi, DO,
Niels D. Martin, MD*, Deborah M. Stein, MD, MPH, FACS, FCCM*
R Adams Cowley Shock Trauma Center, University of Maryland School of Medicine

Presenter: Mira Ghneim, MD

Objectives: AP and AC use is common among trauma patients, but the impact of these agents on outcomes in patients with TBI has not been clearly defined. The aim of the study was to assess the association between AC and AP medication use and clinical outcomes in geriatric patients with TBI.

Methods: We conducted an AAST prospective MITC of geriatric patients with TBI across 43 trauma centers. Inclusion criteria were age ≥40, and CT-verified TBI. Patients with any non-head Abbreviated Injury Scale (AIS) score >2 and presentation >24 hours after injury were excluded. Patients were stratified by AP (Aspirin or Clopidogrel), AC (Warfarin, Direct Oral Anticoagulants, or Enoxaparin), or both. The primary outcomes were length of hospital stay (LOS), ICU LOS, receipt of palliative interventions, mortality and discharge disposition. We compared outcomes between those with and without AC/AP use using Chi-square Goodness of fit and the Wilcoxon rank-sum test.

Results: Among the 85% with home medication history available (2,624/3,081), 1,256 (48%) were on AC or AP and 14% were receiving both. Platelet transfusions were given in 18% of patients on AP. For AC reversal, 57% received Vitamin K, 20% were transfused plasma and 8% received prothrombin complex concentrate. AC/AP patients were older, with more severe injury (defined by head AIS >4) and were more likely to receive palliative interventions.(Table 1) There were trends toward increased lesion progression on repeat CT in patients on AC/AP and a lower rate of return to pre-injury residence upon discharge. Neurosurgical intervention and mortality rates were similar, as were LOS and ICU LOS.(Table 1)

Conclusions: A large proportion of geriatric patients with TBI present with a history of AP/AC use. Although these patients had more severe TBI, and a higher risk of intracranial injury progression, AP/AC use was not associated with increased mortality.

Table 1. Characteristics and Outcomes of Adults aged 64 and Older with TBI by Anticoagulant and Antiplatelet use, n= 1,868			
	AP/AC, n=1,256	No AP/AC, n=612	P value
Age	79.9± 7.3	77.8±7.3	<0.001
Antiplatelet (Aspirin, Clopidogrel)	80%	0	
Anticoagulants (Warfarin, Direct Oral Anticoagulants, Enoxaparin)	34%	0	
Both Antiplatelet and Anticoagulants	14%	0	
Cardiac history	94%	76%	0.001
Head AIS > 4	19%	14%	0.04
GCS 13-15	83%	81%	0.34
# CT scans	1.7± 1.3	1.7±1.2	0.21
Received platelet transfusion	18%	-	<0.001
Received Prothrombin Complex Concentrate	8%	-	
Received Plasma	20%	-	
Received Vitamin K	57%	-	
CT scan worsening	25%	21%	0.085
Hospital LOS	5.6±6.4	5.6±6.4	0.84
ICU LOS	3.9±4.9	3.9±6.9	0.99
Neurosurgical intervention	8.8%	8.5%	0.85
Palliative interventions	16%	13%	0.05
Mortality	10%	9%	0.43
Discharged to pre injury residence	53%	56%	0.37

Quick Shot #10
January 16, 2020
9:54 am

INTO THE WILD AND ONTO THE TABLE - A MULTICENTER ANALYSIS OF WILDERNESS FALLS

Matthew D. Bernard, Matthew J. Martin, MD, FACS*,
Bryce R.H. Robinson, MD, MS, FACS, FCCM*, Bellal Joseph, MD*, Joshua G. Corsa, MD*,
Muhammad Zeeshan, MD, David S. Morris, MD, FACS*, Kevin N. Harrell, MD*,
Robert A. Maxwell, MD*, Allison E. Berndtson, MD, FACS*, Terry Curry, RN,
Michael Rott, PA-C, Krista L. Kaups, MD, FACS*, Rachel Dirks, PhD, CCRP,
Clay Cothren, MD, Caitlin Robinson, Zachary D. Warriner, MD*, Kenji Inaba, MD,
Alison M. Wilson, MD, FACS*, Thomas J. Schroeppel, MD*, Zachary Stillman, MD,
Julie A. Dunn, MS, MD*, Trinette Chapin, RN, Ryan Phillips, MD, Niti Shahi, MD,
Catherine Velopulos, MD, MHS, FACS*, Shane Urban, RN, William R.C. Shillinglaw, DO*,
Michael J. Schurr, MD*, Terrie Smith, RN, CCRN, Sabino Lara, MD,
Carlos V.R. Brown, MD*, Andrew C. Bernard, MD, FACS*
University of Kentucky

Presenter: Matthew D. Bernard

Objectives: Wilderness activities expose outdoor enthusists to austere environments with injury potential, including falls from height. The majority of published data on falls from height have been in urban environments, with little data on epidemiology/outcomes in wilderness locations. We sought to more accurately describe the injury pattern of wilderness falls, and to further distinguish rock climbers as a unique demographic and pattern of injury.

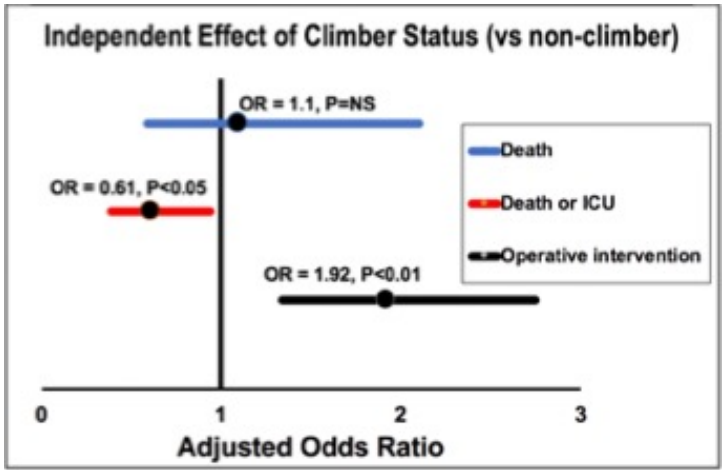
Methods: Data were collected from 17 centers on all wilderness falls (fall from cliff: ICD-9 e884.1, ICD-10 w15.xx) from 2007-2016 as a Multicenter Investigation. Demographics, injury characteristics, and care delivery were analyzed. Additional comparative analysis was performed for climbing (participating in rock climbing when injured) vs non-climbing mechanisms.

Results: Over the 10 year study period, 831 wilderness fall victims were analyzed (216 climbers, 615 non-climbers) 69% of patients were men with a median ISS of 10 (IQR=12). Average fall height was 50 feet and average rescue/transport time was 4.8h. 19% were intoxicated. The most common injury regions were soft tissue (63%, median AIS>0=1 IQR=0), lower extremity (53%, median AIS>0=2 IQR=1), and head (43%, median AIS>0=2 IQR=1). Non-climbers had a higher incidence of severe head and facial injuries despite having equivalent overall ISS (Table). On multivariate analysis, climbing remained independently associated with increased need for surgery but lower odds of ICU admission or death (Figure).

Conclusions: Wilderness falls represent a unique population with distinct patterns of predominantly soft tissue, head, and extremity injury. Climbers are younger, usually male, more often discharged home, and require more surgery but less critical care.

	Climber	Non-Climber	P-Value
Intoxication	9%	23%	.001
Night time	0.6%	25%	.001
Severe Injury (AIS>2)			
Head	11%	17%	.02
Chest	22%	21%	.92
Abdomen	3%	6%	.14
ISS > 15	32%	32%	.93
Facial Injury	15%	24%	.009
Extremity Injury	78%	65%	.006
Operative injuries	43%	30%	.001
Died	8%	8%	.98
D/C Disposition	Home 90% Rehab 9%	Home 83% Rehab 15%	.05

Statistical Comparison of Injury Patterns in Climbers and Non-Climbers



Analysis of the effect of climber status on odds of death, transfer to ICU, and necessity of operative intervention.

Quick Shot #11
January 16, 2020
9:00 am

PULL BACK THE CURTAIN: EXTERNAL DATA VALIDATION IS AN ESSENTIAL ELEMENT OF QUALITY IMPROVEMENT BENCHMARK REPORTING

Jill L. Jakubus, PA-C, Shauna Di Pasquo, RN, BSN, Judy N. Mikhail, PhD, MBA, RN*, Anne Cain-Nielsen, MS, Peter Jenkins, MD*, Mark R. Hemmila, MD*
University of Michigan

Presenter: Jill L. Jakubus, PA-C

Objectives: Accurate and reliable data is pivotal to credible risk-adjusted modeling and hospital benchmarking. Evidence assessing the reliability and accuracy of data elements considered as variables in risk-adjustment modeling and measurement of outcomes is lacking. This deficiency holds the potential to compromise benchmarking integrity. We detail the findings of a longitudinal program to evaluate the impact of external data validation on data validity and reliability for variables utilized in benchmarking of trauma centers.

Methods: A collaborative quality initiative-based study was conducted of 29 trauma centers from March 2010 through December 2018. Case selection criteria were applied to identify high-yield cases that were likely to challenge data abstractors. 127,238 total variables were re-abstracted and reported to trauma centers. Study endpoints included data accuracy (agreement between registry data and contemporaneous documentation) and reliability (consistency of accuracy within and between hospitals). Data accuracy was assessed by mean error rate and type (under capture, inaccurate capture, or over capture). Cohen's Kappa estimates were calculated to evaluate reliability.

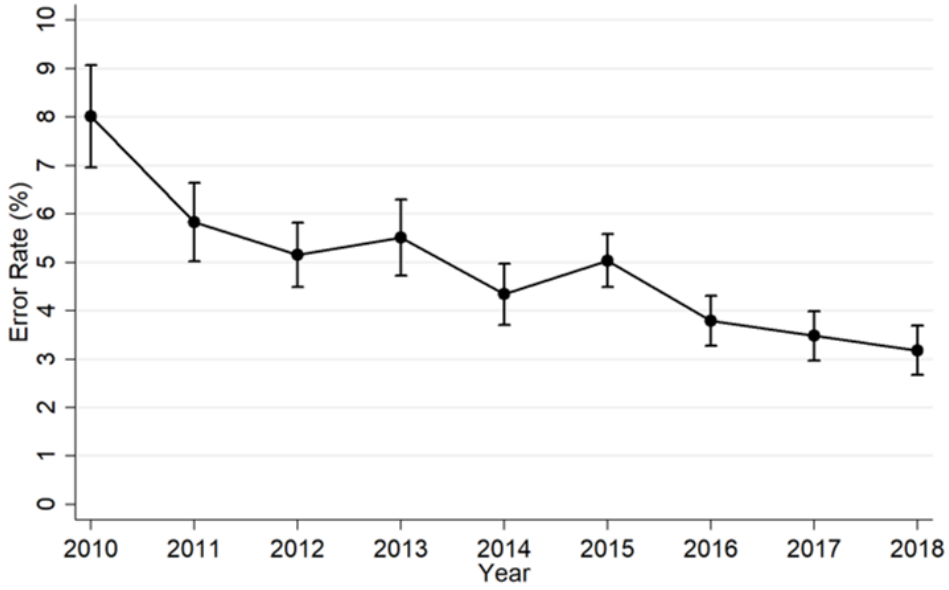
Results: 185,120 patients met the collaborative inclusion criteria. 1,243 submissions were re-abstracted. The initial validation visit demonstrated the highest mean (+/- SD) error rate at 6.2% (+/- 4.7), and subsequent validation visits demonstrated a statistically significant decrease in error rate compared to the first visit (Figure 1). The mean hospital error rate steadily improved over time (Figure 2). Reliability of substantial or higher (kappa > 0.61) was demonstrated in 90% of the 20 co-morbid conditions considered in the benchmark risk-adjustment modeling, 39% of these variables exhibited a statistically significant ($p < 0.05$) interval decrease in error rate from the initial visit.

Conclusions: Implementation of an external data validation program is correlated with increased data accuracy and reliability. Improved data reliability both within and between trauma centers improved risk-adjustment model validity and quality improvement program feedback.

Validation Visit	Error Type 1[a]	Error Type 2[b]	Error Type 3[c]	All Error Types	p Value[d]
1	3.5 ± 3.6	2.1 ± 2.1	0.6 ± 0.9	6.2 ± 4.7	reference
2	2.2 ± 2.4	1.7 ± 1.8	0.6 ± 1.1	4.5 ± 3.8	<0.001
3	2.1 ± 2.1	1.4 ± 1.6	0.5 ± 0.9	3.9 ± 3.0	<0.001
4	2.3 ± 3.2	1.3 ± 1.6	0.6 ± 1.1	4.1 ± 3.9	<0.001
5	1.7 ± 2.3	1.5 ± 1.8	0.6 ± 1.3	3.9 ± 3.4	<0.001
6	2.0 ± 2.3	1.3 ± 1.4	0.4 ± 1.0	3.7 ± 3.1	<0.001
7	1.5 ± 2.4	1.2 ± 1.6	0.4 ± 0.8	3.1 ± 3.5	<0.001
8	2.6 ± 3.9	0.8 ± 0.8	0.3 ± 0.5	3.6 ± 4.3	<0.001
All Visits	2.3 ± 2.8	1.5 ± 1.8	0.5 ± 1.0	4.4 ± 3.9	

Data represented as % (± SD) unless otherwise noted.
[a] Error type 1 indicates the validator identified the variable, but the center did not.
[b] Error type 2 indicates the validator and center identified the variable but disagreed with the answer.
[c] Error type 3 indicates the center identified the variable, but the validator was unable to confirm documentation consistent with the definition.
[d] Comparisons were performed for all error types by validation visit (visit 1 vs. subsequent visits 2-8).

Mean Hospital Error Rate by Validation Visit and Error Type



Mean Hospital Error Rate by Year

Quick Shot #12
January 16, 2020
9:06 am

DISPARITIES IN RURAL VS URBAN FIELD TRIAGE: RISK AND MITIGATING FACTORS FOR UNDERTRIAGE

Andrew-Paul Deeb, MD, Heather Phelos, MPH, Andrew B. Peitzman, MD*,
Timothy Billiar, MD, Jason L. Sperry, MD, MPH*, Joshua B. Brown, MD, MSc*
University of Pittsburgh Medical Center

Presenter: Andrew-Paul Deeb, MD

Objectives: There are known outcome disparities among patients injured in rural vs urban settings. Many cite access to care; however, causal mechanisms are not well defined. One potential factor is field triage. Thus, our objective was to evaluate differences in prehospital undertriage (UT) in rural vs urban settings.

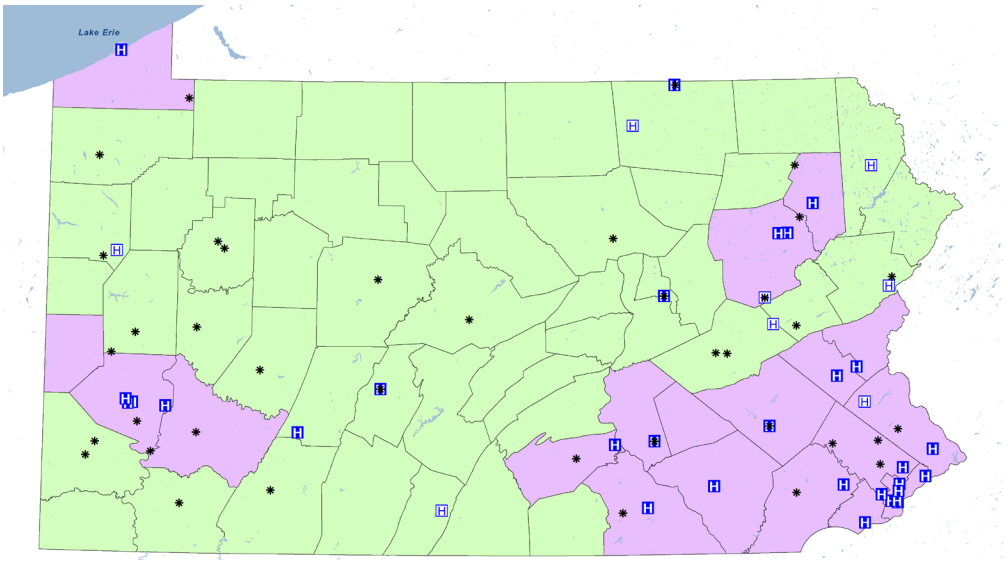
Methods: Adult patients in PTOS 2000-2017 were included. Rural/urban setting was defined by county (FIG). UT was defined as patients with physiologic or anatomic triage criteria who were not initially transported to a level 1 or 2 trauma center (TC). Logistic regression determined the association between UT and patient rural/urban setting while adjusting for transport distance and prehospital time. Models were expanded to evaluate the effect of individual triage criteria, TC rural/urban setting, and transport mode on UT.

Results: 453,112 patients were included (26% rural). UT was higher in rural vs urban patients (8.6% vs 3.4%, $p<0.01$). UT was associated with increased mortality (OR 1.17; 95%CI 1.09-1.25, $p<0.01$). Rural setting was associated with UT after adjusting for distance and prehospital time (OR 3.52; 95%CI 1.82-6.78, $p<0.01$). Different triage criteria were associated with UT in rural vs urban settings (TABLE). Rural setting was associated with UT for patients transferred to an urban TC (OR 3.32; 95%CI 1.75-6.25, $p<0.01$), but not a rural TC (OR 0.68; 95%CI 0.08-5.53, $p=0.72$). Rural setting was associated with UT for ground (OR 5.01; 95% 2.65-9.46, $p<0.01$) but not air transport (OR 1.18; 95%CI 0.54-2.55, $p=0.68$).

Conclusions: UT is more common in rural settings. Specific triage criteria are associated with UT in rural and urban settings. Lack of a rural TC requiring transfer to an urban TC is a risk factor for UT of rural patients. Air transport mitigated the risk of UT in rural patients. Poor TC access resulting in UT plays a role in rural disparity, and system interventions may reduce UT in rural areas.

TABLE. Association of national field triage guideline criteria with undertriage in rural and urban settings

Rural			*Urban*		
Criterion	*Odds ratio (95% CI)*	*p value*	*Criterion*	*Odd ratio (95% CI)*	*p value*
Crush injury	6.81 (3.59-12.92)	<0.01	Paralysis	6.42 (3.53-11.70)	<0.01
GCS≤13	6.12 (4.88-7.66)	<0.01	Amputation	6.00 (3.51-10.27)	<0.01
Penetrating injury	5.79 (4.06-8.25)	<0.01	Pelvic fracture	3.94 (2.94-5.27)	<0.01
Pelvic fracture	5.13 (3.77-6.99)	<0.01	GCS≤13	3.29 (2.49-4.35)	<0.01
≥2 proximal long bone fractures	3.11 (2.16-4.46)	<0.01	≥2 proximal long bone fractures	2.13 (1.66-2.74)	<0.01
Flail chest	2.12 (1.57-2.89)	<0.01	Penetrating injury	1.91 (1.19-3.05)	0.01
Paralysis	1.97 (1.15-3.38)	0.01	SBP<90	1.40 (1.12-1.74)	<0.01
SBP<90	1.96 (1.51-2.55)	<0.01	Flail chest	1.39 (0.85-2.29)	0.19
Amputation	0.44 (0.16-1.20)	0.11	Crush injury	1.32 (0.55-3.17)	0.53
Open skull fracture	0.51 (0.36-0.73)	<0.01	Open skull fracture	1.09 (0.77-1.56)	0.60
RR <10 or >29	0.42 (0.26-0.68)	<0.01	RR <10 or >29	0.75 (0.57-0.98)	0.03



Map of Pennsylvania depicting urban counties (purple) and rural counties (green) as classified by the Pennsylvania Trauma System Foundation. Blue background hospital symbols represent level 1 or level 2 trauma centers; White background hospital symbols represent level 3 or level 4 trauma centers. Black stars represent air medical helicopter bases.

Quick Shot #13
January 16, 2020
9:12 am

ELECTRONIC TRAUMA RESUSCITATION DOCUMENTATION AND DECISION SUPPORT USING T6 HEALTH SYSTEMS MOBILE APPLICATION: A COMBAT TRAUMA CENTER PILOT PROGRAM

Lisa Angotti, MD, MS*, Remealle A. How, MD*, Dominick Vitale, MD*, Jared Folwell, MD, Katie Barnack, RN, Jason Neel, RN, Charlie Srivilasa, MD, Valerie Sams, MD*
San Antonio Military Medical Center

Presenter: Lisa Angotti, MD, MS

Objectives: The care of trauma patients in combat operations is handwritten on a 5-page flow sheet. The process requires the manual scanning and uploading of paper documents to bridge the gap between electronic and paper record management. There is an urgent operational need for an information technology solution that will enable medics to better capture patient treatment information which will improve long term healthcare without impacting short term care responsibilities.

Methods: We conducted a PI project to assess T6 Health Systems Mobile Application to explore feasibility and improve patient data collection at a deployed trauma hospital. We conducted a head-to-head comparison of electronic records versus handwritten records to include completeness and accuracy of data capture to assess non-inferiority.

Results: Over the 90-day pilot there were 131 trauma evaluations of which 53 patient resuscitations (40%) were also documented in the electronic application. We compared completeness and accuracy of admit, prehospital, primary survey, secondary survey, interventions, and trends data. (Figure 1) We found an overall 13% increase in data capture at 96% accuracy compared to the written record suggesting the electronic record was superior. We also had the medical evacuation teams document prehospital and en route care then synchronize the record in the trauma bay, allowing the trauma teams there to continue documenting on the same patient record, likely contributing to superiority since teams did not have to re-document based on an oral report. (Figure2)

Conclusions: Our pilot program in the deployed environment not only demonstrated a mobile technology that enhanced the completeness and accuracy of pen and paper trauma documentation but also proved capable of providing patient-specific decision support and real-time data analysis.

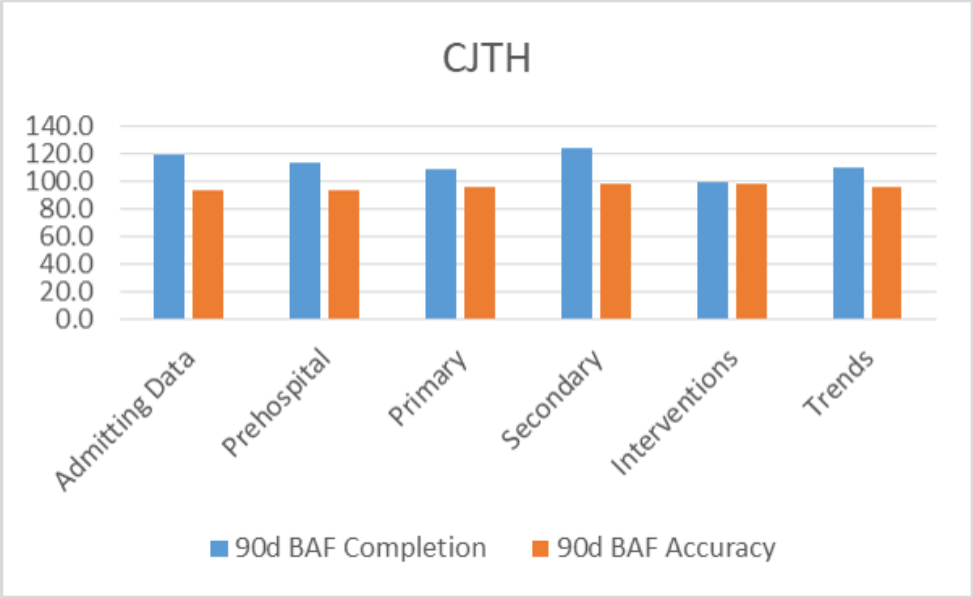


Figure 1 Comparison of Data Capture

Figure 2 Prehospital Medic Synchronization

Quick Shot #14
January 16, 2020
9:18 am

RISK ASSESSMENT FOR INTRA-ABDOMINAL INJURY FOLLOWING BLUNT TRAUMA IN CHILDREN: DERIVATION AND VALIDATION OF A MACHINE LEARNING MODEL

Christopher Pennell, MD, Conner Polet, MD, L. Grier Arthur, MD,
Harsh Grewal, MD*, Stephen Aronoff, MD, MBA
St. Christopher's Hospital for Children

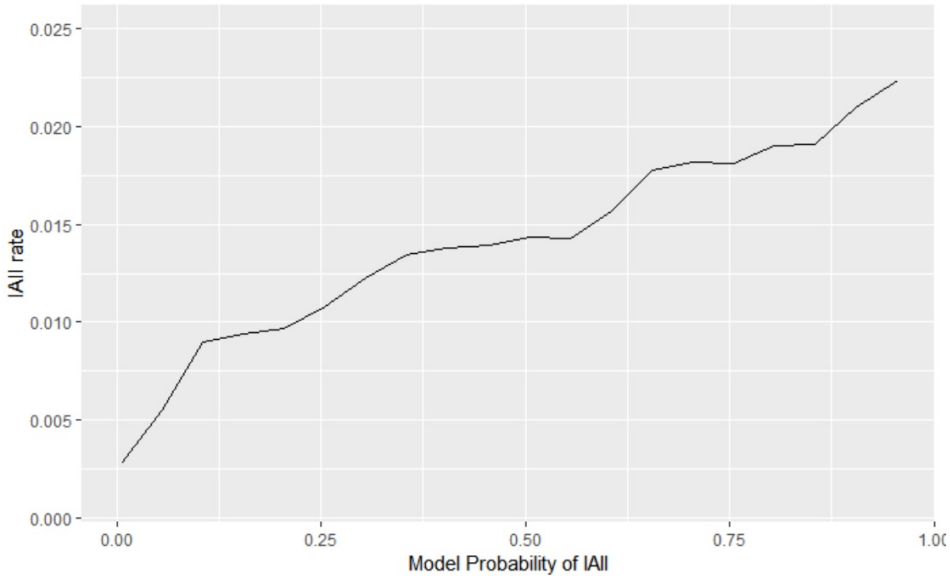
Presenter: Christopher Pennell, MD

Objectives: Computed tomography (CT) is the gold standard for diagnosing intra-abdominal injury (IAI) but has costs financially and in radiation exposure. The Pediatric Emergency Care Applied Research Network (PECARN) uses a linear decision tree to provide group estimates of risk and identify those at low risk of IAI requiring intervention (IAI-I) in whom CT may be omitted. While useful, the model cannot provide an individualized risk assessment. We hypothesized that machine learning algorithms could provide a more individualized assessment to better predict children at low risk of IAI-I.

Methods: The PECARN dataset was used to derive a model for identifying IAI-I (one causing death, requiring surgical or angiographic intervention, blood transfusion, or hospitalization ≥2 nights). The dataset was divided into training (n=7940) and validation (n=4089) subsets. A model was created using 19 clinical variables including emesis, dyspnea, GCS<15, visible thoracic or abdominal trauma, seat belt sign, abdominal distension, tenderness or rectal bleeding, peritoneal signs, absent bowel sounds, flank pain, pelvic pain or instability, gender, age, HR, and RR. Five algorithms were optimized and predicted IAI-I rates were compared to actual rates. The model was validated using the validation subset.

Results: Of 12,029 included children, 274 (2.27%) experienced IAI-I. Of the 5 models, GBM (generalized boosted) and RF (random forest) produced the highest correlations with IAI-I rates (R^2= .99 and .96, respectively); RF had the widest range of predicted values and accurately predicted children with a risk of IAI-I as low as 0.28%.

Conclusions: We developed a machine learning model that accurately identifies children with the lowest risk of IAI-I after blunt trauma through individualized risk stratification. Application of this model to clinical practice can help to inform clinical decision making.



Receiver Operator Curve (ROC) for predicting IAI-I in children plotting the actual rate of IAI-I (y-axis) against the model's predicted probability of IAI-I. $_R2$= 0.99.

Quick Shot #15
January 16, 2020
9:24 am

THE ELUSIVE TRAUMA DENOMINATOR: FEASIBILITY OF COMBINING DATASETS TO QUANTIFY THE TRUE BURDEN OF FIREARM INJURY

Heather E. Carmichael, MD, Jason Samuels, MD, Ethan Jamison, MHS, Kirk Bol, MSPH,
Jamie J. Coleman, MD, FACS*, Eric M. Campion, MD*,
Catherine Velopulos, MD, MHS, FACS*
University of Colorado, Aurora

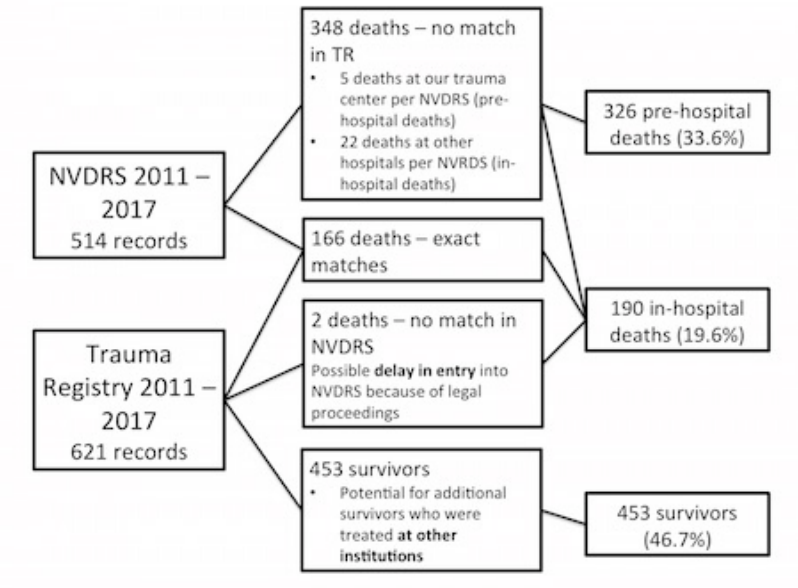
Presenter: Heather E. Carmichael, MD

Objectives: Evidence guiding firearm injury prevention is limited by current data collection infrastructure. Trauma registries (TR) omit pre-hospital deaths and underestimate the burden of injury. In contrast, the National Violent Death Reporting System (NVDRS) tracks all firearm deaths including pre-hospital fatalities, excluding survivors. This is a feasibility study to link these datasets through collaboration with our state Public Health Department (PHD), aiming to better estimate the burden of firearm injury and assess comparability of data.

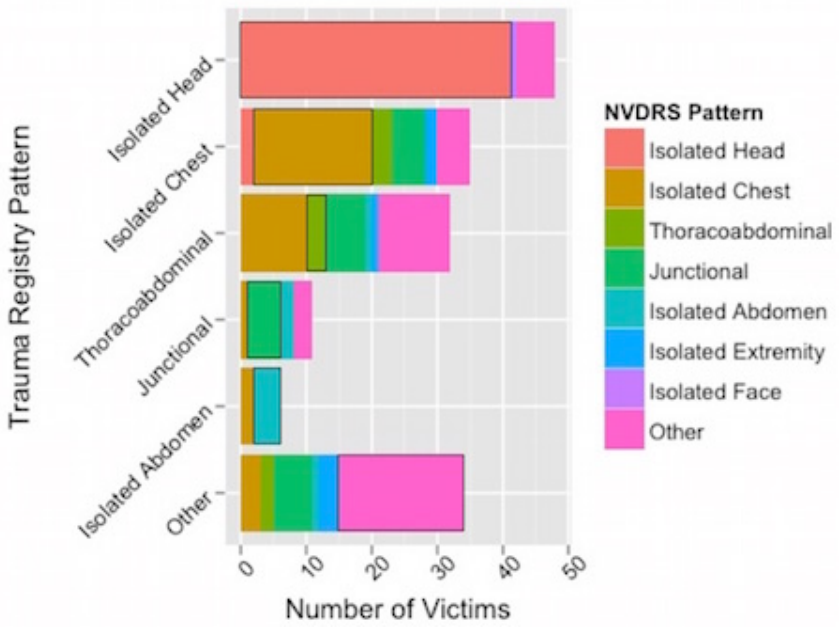
Methods: We reviewed all firearm injuries in our Level I TR from 2011–2017. We provided the PHD with in-hospital deaths, which they linked to NVDRS using patient identifiers and time of injury/death. The NVDRS collates information about circumstances, incident type, and wounding patterns from multiple sources (i.e. death certificates, medical examiner, law enforcement). We considered only subjects with injury location in a single county to best estimate in-hospital and pre-hospital mortality.

Results: Of 168 TR deaths, 166 (99%) matched to NVDRS records (Fig 1). Based on data linkages, we estimate 326 pre-hospital deaths, 190 in-hospital deaths and 453 survivors, for a total of 969 firearm injuries. For the matched patients, there was near-complete agreement regarding simple demographic variables (e.g. age and sex), and good concordance between incident types (suicide, homicide, etc). However, agreement in wounding patterns between NVDRS and TR varied (Fig 2).

Conclusions: We demonstrate feasibility of linkage of TR and NVDRS with good concordance for many variables, allowing for good estimation of the trauma denominator. Standardized data collection methods in one dataset could improve methods used by the other, e.g. training NVDRS abstractors to utilize AIS for injury patterns. Such data integration holds immediate promise for guiding prevention strategies.



Flow diagram describing linkage of the two datasets to estimate pre-hospital and in-hospital mortality, as well as survivorship after firearm injury.



Comparison of wounding patterns according to NVDRS and TR classifications. Agreement between the two datasets varied, ranging from just 9% agreement among thoracoabdominal injuries to 85% in isolated head injuries (cases with agreement are highlighted in black boxes).

Quick Shot #16
January 16, 2020
9:30 am

PUTTING A HALT TO UNNECESSARY TRANSFERS: DO PATIENTS WITH ISOLATED SUBARACHNOID HEMORRHAGE NEED A TRAUMA CENTER?

Danielle L. DeFoe, DO, Jyoti Sharma, MD MPH*, Jenna Gillen, DO, YenHong Kuo, PhD, Saraswati Dayal, MD*, Kelly A. Rippey, MD*, Setu Dalal, DO, Elizabeth Kiselak, MD*, Sanjeev Kaul, MD*, Javier Martin Perez, MD, Stephen Cohn, MD*
Hackensack University Medical Center

Presenter: Danielle L. DeFoe, DO

Objectives: Trauma patients with isolated subarachnoid hemorrhage (iSAH) presenting to non-trauma centers are typically transferred to an institution with neurosurgical availability. However, recent studies suggest that iSAH is a benign clinical entity with an excellent prognosis. This investigation aims to evaluate the neurosurgical outcomes of traumatic iSAH with GCS 13-15 who were transferred to a higher level of care.

Methods: The American College of Surgeon (ACS) Trauma Quality Improvement Program was retrospectively analyzed from 2010-2015 for transferred patients ≥ 16 yo with blunt trauma, iSAH, and GCS ≥ 13. Those with any other body region abbreviated injury score (AIS) ≥ 3, positive or unknown alcohol/drug status, and requiring mechanical ventilation were excluded. The primary outcome was need for neurosurgical intervention (i.e. intracranial monitor or craniotomy/craniectomy).

Results: A total of 11,380 patients with blunt trauma, iSAH, and GCS 13-15 were transferred to an ACS Level I/II from 2010-2015. These patients were ≥ 65 yo [Median: 72 (IQR 59-81)], white (83%), and had one or more comorbidities (72%). 18% reported a bleeding diathesis/chronic anticoagulation on admission. Most patients had fallen (80%), had a GCS of 15 (84%), and were mildly injured [Median Injury Severity Score (ISS): 9 (IQR 5-14)]. Only 1.7% required neurosurgical intervention with 55% of patients being admitted to the ICU for a median of 2 days (IQR 1-3). 2.2% of the patients died. The median hospital LOS was only 3 days (IQR 2-5) and the most common discharge location was home with self-care (62%).

Conclusions: Trauma patients transferred for isolated subarachnoid hemorrhage with GCS 13-15 are at very low risk for requiring neurosurgical intervention.

Quick Shot #17
January 16, 2020
9:36 am

PREHOSPITAL END TIDAL CARBON DIOXIDE PREDICTS MASSIVE TRANSFUSION AND DEATH FROM TRAUMA

Eric M. Campion, MD*, Alexis Cralley, MD, Caitlin Robinson, Angela Sauaia, MD, PhD, Fredric Pieracci, MD, MPH, Ryan A. Lawless, MD*, Barry Platnick, MD*, James Robinson, David Edwards, Kevin McVaney, MD, Ernest Eugene Moore, MD*, Mitchell J. Cohen, MD, FACS, Jamie J. Coleman, MD, FACS*, Charles Fox, MD, Clay Cothren, MD
Denver Health Medical Center

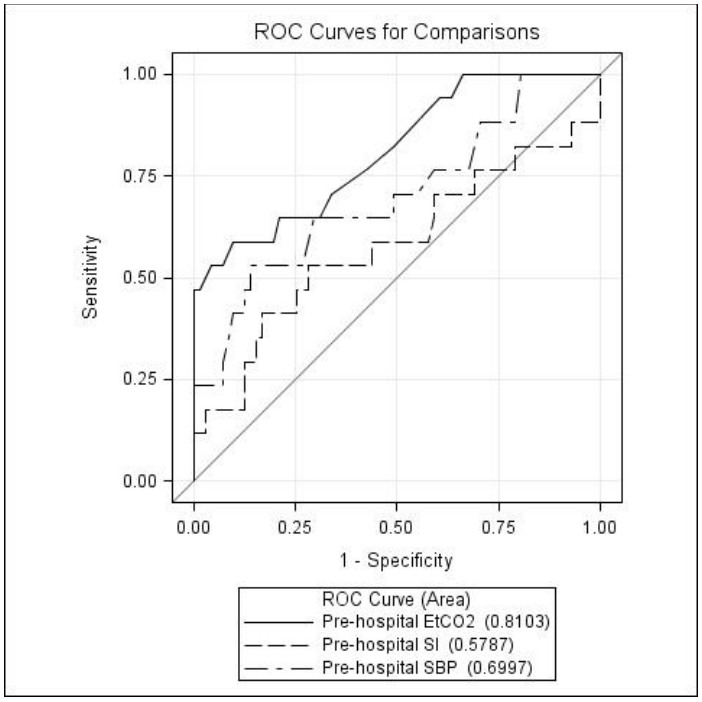
Presenter: Eric M. Campion, MD

Objectives: End tidal carbon dioxide($ETCO_2$) levels are easily measured in the prehospital setting. Prior work has suggested that $ETCO_2$ may be predictive of mortality in trauma, presumably by identifying hypoperfusion. However, the cause of death in prior studies or association of $ETCO_2$ levels with bleeding is unknown. We hypothesized that $ETCO_2$ would be predictive of mortality and need for transfusion.

Methods: All trauma patient with prehospital $ETCO_2$ values from 4/2016-8/2018, who did not require prehospital CPR were included. Receiver operating characteristics(ROC) curves were constructed. We compared the predictive performance(area under the ROC, AUROC) for death and massive transfusion(MT: >10 RBC units or death/24hrs) of prehospital ETCO2, shock index(SI) and systolic blood pressure(SBP). The Youden index was used to determine optimal cutoffs and positive/negative predictive values(PPV, NPV) were calculated. Numerical variables are reported as median(interquartile range).

Results: 96 patients, age 40 (24-55) years, ISS 26(13-35); 85% suffered blunt trauma. MT rate was 33% and mortality was 23%. Prehospital $ETCO_2$'s AUROC for death was 0.72(95%CI: 0.59-0.86) compared with AUROC=0.51(0.34-0.67) for SI and 0.64(0.49-0.79) for SBP. Prediction of OR requirement within 6 hours showed $ETCO_2$ AUROC= 0.69(0.55-0.83) vs SI AUROC=0.62(0.46-0.77) vs SBP AUROC=0.65(0.52-0.79). Similarly, the predictive performance of $ETCO_2$ for MT was better than SI and SBP(AUROCs: 0.81 vs 0.58 and 0.70, respectively) (Figure). The $ETCO_2$ Youden Index for death was 23mmHg PPV=64%; NPV=84%); for MT the Youden Index was 28mmHg(PPV=44%; NPV=91%). These values outperformed the PPV and NPV of SI and SBP for all outcomes.

Conclusions: Prehospital $ETCO_2$ is a novel predictor that outperformed SI and SBP in prediction of mortality, MT and OR requirement within 6 hours. Consideration should be given to including $ETCO_2$ to triage and study enrollment criteria.



Predictive performance of prehospital end tidal carbon dioxide, shock index, and systolic blood pressure for massive transfusion or death.

Quick Shot #18
January 16, 2020
9:42 am

MISSION GROUND TIME AND ITS IMPACT ON THE COVERAGE OF FATAL MOTOR VEHICLE INCIDENTS IN ALABAMA

Weston A. Smedley, BSc, Russell Griffin, PhD, John Killian, MD,
Jeffrey D. Kerby, MD, PhD*, Jan Jansen, MBBS PhD*
University of Alabama, Birmingham

Presenter: Weston A. Smedley, BSc

Objectives: The development of a trauma system has been shown to decrease mortality and improve outcomes for the severely injured. A critical element of the trauma system is air prehospital transport. Helicopter emergency services (HEMS) require mission ground time (time for launch, landing, and loading of casualties) to transport patients. In this study, our aim was to evaluate how mission ground time (MGT) affects HEMS ability to reach fatal motor vehicle collisions (MVCs) within a one hour access time threshold.

Methods: Fatal MVCs in Alabama, 2015-2017 (n=2584), were extracted from the Fatality Analysis Reporting System. Elliptical isochrones were created using helicopter bases (n=15) and Level-I and II trauma centers (n=5) accounting for air speed and MGTs (30, 25, 20, 15 minutes). The ellipses and MVC data were analyzed in ArcGIS to determine if the collision would have been reached by air. For each MGT ellipse, count and percent of total MVCs covered were calculated and stratified by state trauma region (Table 1).

Results: Coverage increased by ~15% for each 5-min increment of MGT excluding 15-min MGT (6%). With a MGT of 30, a majority of fatal MVCs were covered in regions with Level-I centers. Regions with high coverage with 30-min MGT did not have meaningful increases in fatal MVCs covered beyond a 25-min MGT. Regions with limited coverage at 30-min MGT needed a MGT of 20 in order to have a majority of fatal MVCs covered.

Conclusions: A decrease in MGT from 30 to 20-min would result in a 30% increase in the number of fatal MVCs covered. A change of MGT by 5-min resulted in HEMS coverage of nearly all fatal MVCs in regions with sufficient trauma center coverage. Decreases of MGT beyond 20 would provide limited returns and still fail to cover all incidents. Attention to MGT may benefit patients involved in fatal MCVs by increasing the number that could potentially reach a trauma center within one flight hour.

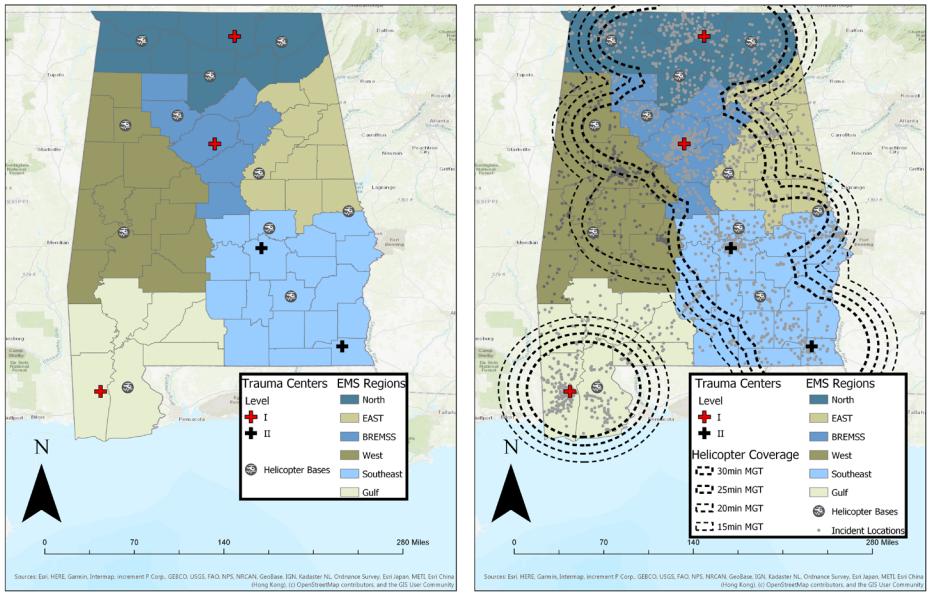


Figure 1: Alabama Trauma Centers, Helicopter Coverage, and Fatal MCVs

Table 1. Comparison of counts of fatal collisions that could access a level I or II trauma center, by helicopter, by mission ground time

	Mission Ground Time			
	30 minutes	25 minutes	20 minutes	15 minutes
ALL REGIONS				
# Collisions covered by rotary (%)	1782 (68.9)	2038 (78.9)	2311 (89.4)	2445 (94.6)
# Collisions not covered by rotary	802	546	273	139
Sum additional collisions covered (% increase)	--	256 (14.4)	529 (13.3)	663(5.8)
Count ratio	2.22	3.73	8.46	17.59
REGION 1 – NORTH				
# Collisions covered by rotary (%)	461 (87.5)	508 (96.3)	519 (98.5)	522 (99.1)
# Collisions not covered by rotary	66	19	8	5
Sum additional collisions covered (% increase)	--	47 (10.1)	58 (2.2)	61 (0.6)
Count ratio	6.98	26.74	64.88	104.40
REGION 2 – EAST				
# Collisions covered by rotary (%)	110 (35.5)	156 (50.5)	229 (74.1)	285 (92.2)
# Collisions not covered by rotary	199	153	80	24
Sum additional collisions covered (% increase)	--	46 (41.8)	119 (46.8)	175 (24.5)
Count ratio	0.55	1.02	2.86	11.88
REGION 3 – BREMSS				
# Collisions covered by rotary (%)	471 (93.1)	496 (98.0)	505 (99.8)	505 (99.8)
# Collisions not covered by rotary	35	10	1	1
Sum additional collisions covered (% increase)	--	25 (5.3)	34 (1.8)	34 (0.0)
Count ratio	13.46	49.60	505.00	505.00
REGION 4 – WEST				
# Collisions covered by rotary (%)	40 (12.5)	121 (37.8)	236 (73.4)	269 (84.1)
# Collisions not covered by rotary	280	199	84	51
Sum additional collisions covered (% increase)	--	81 (302.5)	196 (95.0)	229 (14.0)
Count ratio	0.14	0.61	2.81	5.27
REGION 5 – SOUTHEAST				
# Collisions covered by rotary (%)	409 (75.6)	455 (84.1)	508 (93.9)	536 (99.1)
# Collisions not covered by rotary	132	86	33	5
Sum additional collisions covered (% increase)	--	46 (11.2)	99 (11.6)	127 (5.5)
Count ratio	3.10	5.29	15.39	107.20
REGION 6 – GULF				
# Collisions covered by rotary (%)	291 (76.4)	302 (79.3)	314 (82.4)	328 (86.1)
# Collisions not covered by rotary	90	79	67	53
Sum additional collisions covered (% increase)	--	11 (3.8)	23 (4.0)	37 (4.5)
Count ratio	3.23	3.82	4.69	6.19

Quick Shot #19
January 16, 2020
9:48 am

THE GERIATRIC TRAUMA PATIENT: A NEGLECTED INDIVIDUAL IN A MATURE TRAUMA SYSTEM

Frederick Rogers, MD, MS, FACS*, Michael Horst, PhD, Tawnya Vernon, BA, Tamer Shtayyeh, DO, Alan D Cook, MD*, Eric H. Bradburn, DO, MS, FACS*
Penn Medicine Lancaster General Health

Presenter: Eric H. Bradburn, DO, MS, FACS

Objectives: Those aged >65 represent the fastest growing demographic in the U.S. As such, their care has been emphasized by trauma entities such as the ACSCOT. Unfortunately much of that focus has been on their care once they reach the hospital with little attention on the access of geriatric trauma patients (GTPs) to trauma centers (TCs). We sought to determine the rate of geriatric undertriage (UT) to TCs within a mature trauma system. We hypothesized that the GTP would have a higher UT rate (UTR) compared to their younger counterpart.

Methods: From 2003-2015, all geriatric (age>65) admissions with an Injury Severity Score (ISS) >9 from the PTSF registry and those meeting trauma criteria (ICD-9: 800-959) from the Pennsylvania Health Care Cost Containment Council (PHC4) database were included. UTR was defined as patients not admitted to accredited TCs (n=35) divided by the total number of patients as from the PHC4 database. PHC4 contains inpatient admissions within PA while PTSF reports admissions to PA TCs. ArcGIS Desktop and GeoDa were used for geospatial mapping of UT with a spatial empirical Bayesian smoothed UTR and Stata for statistical analyses.

Results: PTSF had 58,336 cases while PHC4 had 111,626 that met inclusion criteria, suggesting a geriatric UTR of 47.7% across PA (Figure 1). Geospatial mapping reveals significant clusters of UT regions with high UTR in some of the rural regions with limited access to a TC. High UTR appears to be mostly centered around non-TCs. UTR for patients with an ISS>15 was 48.4% (Figure 2).

Conclusions: There is a significant number of moderate to severely injured GTPs that do not get admitted to a TC within a mature trauma system. Increased emphasis needs to focus prehospital on identifying the severely-injured geriatric patient including specific geriatric triage protocols.

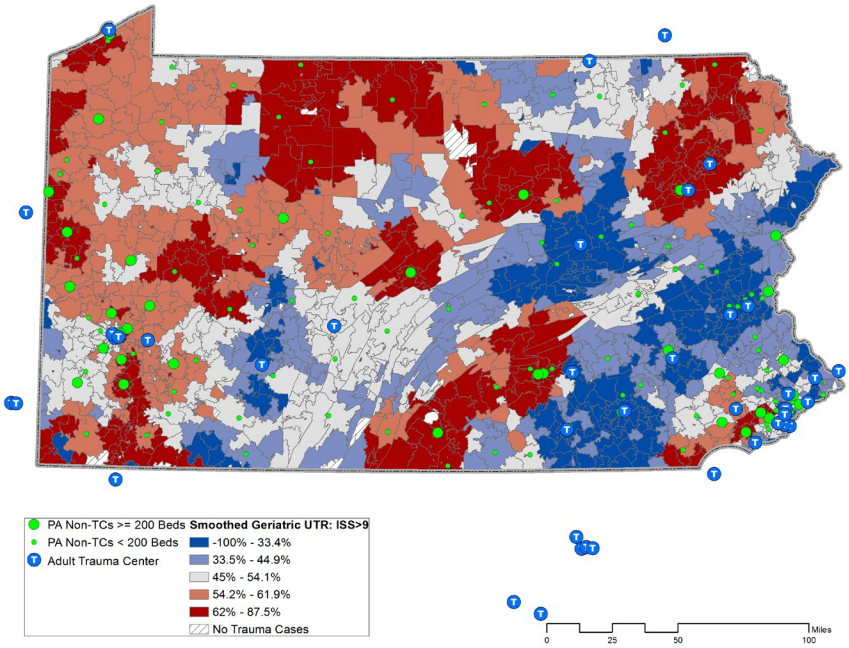


Figure 1. Geriatric Undertriage in a Mature Trauma System (ISS>9)

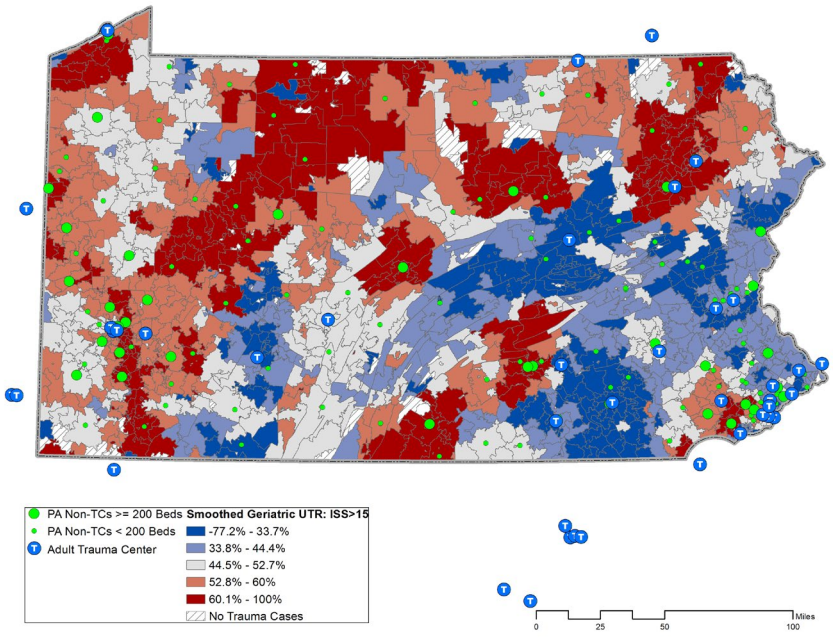


Figure 1. Geriatric Undertriage in a Mature Trauma System (ISS>15)

Quick Shot #20
January 16, 2020
9:54 am

CAUSES OF DEATH FOLLOWING DISCHARGE AFTER TRAUMA IN NORTH CAROLINA

Mary K. Bryant, BS, MD, Staci T. Aubry, MD, Sharon Schiro, PhD,
Arielle Perez, MD, MPH, Lauren Raff, MD*, Rebecca Maine, MD, MPH*
University of North Carolina

Presenter: Mary K. Bryant, BS, MD

Objectives: While a "fourth peak" of delayed trauma mortality has been described, limited data describes the causes of death (COD) for patients in the years following an injury. This study investigates the difference in COD statewide for patients with and without a recent trauma admission.

Methods: This retrospective cohort study compared COD for trauma and non-trauma patients in North Carolina. Death certificates in NC's death registry were matched with the NC trauma registry between 2013–2018 using probabilistic matching on name and date of birth. Patients who died during the index trauma admission were excluded. Bivariate analysis of COD and patient factors were determined with χ^2 tests and regression models. Multiple COD recorded on the death certificates were included.

Results: Of 481554 death records, 18971 (3.9%) were linked to an alive discharge within the trauma registry during the study period. Prior trauma patients (PTP) had a higher incidence of mental illness (27.6% vs 24.2%), heart conditions (42.5% vs 41.5%), and opioid-related (1.8% vs 1.6%) COD compared to non-trauma patients, $p<0.05$ (Table 1). Overall, suicide was higher in the non-trauma cohort (1.5% vs 1.1%), however, PTP had higher incidences of death by MVC (2.5% versus 1.2%), fall (8.1% vs 0.9%), and homicide (0.9% vs 0.6%),$p<0.001$. PTP had 1.16 increased odds of an opioid-related death ($p=0.009$, 95% CI 1.04,1.29) compared to those without prior trauma. For PTP, mental illness related COD was the second leading COD for all age subgroups (16-40y, 41-64y, >65y). Younger PTP had a much higher rate of death from suicide (11.8%) compared to those 41-64y (2.9%) and >65y (0.3%), $p<0.001$.

Conclusions: After hospital discharge, PTP remain at risk of dying from future trauma and mental health conditions. Prevention strategies for PTP should address the increased risk of death from a subsequent traumatic injury, opioid-related death, and suicide, especially in younger adults.

Cause of death*	Prior trauma** N=18971 n (%)	No prior trauma N=462583 n (%)	*p* value
Suicide	211 (1.1)	6792 (1.5)	<0.001
Mental illness	5246 (27.6)	112146 (24.2)	<0.001
Septicemia	1489 (7.8)	35512 (7.7)	0.384
Cirrhosis	494 (2.6)	10994 (2.4)	0.044
Other gastrointestinal disorders	1006 (5.3)	27999 (6.1)	<0.001
Kidney disease	1466 (7.7)	35857 (7.8)	0.904
Musculoskeletal disorders	471 (2.5)	8847 (1.9)	<0.001
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	3385 (17.8)	72540 (15.7)	<0.001
Homicide	169 (0.9)	2691 (0.6)	<0.001
Ischemia	2984 (15.7)	85476 (18.5)	<0.001
Other heart disorders	8055 (42.5)	192100 (41.5)	0.011
Endocrine disorders	2645 (13.9)	75206 (16.3)	<0.001
Cancer	2517 (13.2)	115986 (25.1)	<0.001
Alzheimer's disease	1417 (7.4)	22863 (4.9)	<0.001
Nervous system disorders	2641 (13.9)	51707 (11.2)	<0.001
Motor vehicle accident	478 (2.5)	5771 (1.2)	<0.001
Fall	1541 (8.1)	4127 (0.9)	<0.001
Other injury	662 (3.5)	14087 (3.0)	0.001
Opioid-related	346 (1.8)	7319 (1.6)	0.009

* Most common causes listed, not inclusive of all less common causes

**Eligible for entry into NC State Trauma Registry

Table 1. Most common causes of death for all deaths (N=481554) in North Carolina January 1, 2013, through December 31, 2018, stratified by prior recent trauma admission or not

Quick Shot #21
January 16, 2020
11:15 am

RELATIONSHIP OF BODY MASS INDEX, SERUM CREATINE KINASE, AND ACUTE KIDNEY INJURY AFTER SEVERE TRAUMA

Charles R. Vasquez, MD, Thomas DiSanto, BS, John Reilly, MD, MSCE, Caitlin Forker, BA, Daniel N. Holena, MD, MSCE*, Qufei Wu, MS, Paul Lanken, MD, MSCE, Jason Christie, MD, MSCE, Michael Shashaty, MD, MSCE
University of Pennsylvania

Presenter: Charles R. Vasquez, MD

Objectives: Body mass index (BMI) is associated with acute kidney injury (AKI) after trauma, but underlying mechanisms are unclear. Higher BMI correlates with increased muscle mass even in patients with excess adiposity. We hypothesized that BMI would correlate with higher creatine kinase (CK) release after injury, and that adjustment for serum CK would attenuate the BMI-AKI association.

Methods: Prospective cohort study of 463 critically ill patients at a Level I trauma center with injury severity score (ISS)>15 and serum CK measured in the first 7 days. We defined AKI by AKI Network creatinine criteria. We used Spearman's rho and Wilcoxon rank-sum tests for unadjusted associations, and multivariable logistic regression to adjust the BMI-AKI association for peak CK and confounders.

Results: Median age was 43 years, 350 (76%) were male, 366 (79%) had blunt mechanism, and median ISS was 24. BMI correlated with peak CK (rho 0.20, $p<0.001$). Patients with AKI (n=148, 32%) had higher median peak CK than those without AKI (3650 U/l, IQR 1328-9322 v. 1850 U/l, IQR 583-5139, respectively, $p<0.001$). BMI was significantly associated with AKI in multivariable models adjusted for age, race, sex, diabetes, injury mechanism and severity, and red blood cell transfusions (OR 1.31 per 5 kg/m2, 95% CI 1.09-1.58, p=0.004). Adding peak CK to the model partially attenuated the effect of BMI (OR 1.26 per 5 kg/m2, 95% CI 1.04-1.52, p=0.018), and peak CK remained associated with AKI (OR 1.19 per natural log, 95% CI 1.00-1.41, p=0.049). In addition, serum CK in the first 24h was significantly associated with AKI, even among those with CK<5000 U/l (OR 1.38, 95% CI 1.04-1.83, p=0.026; n=286).

Conclusions: Serum CK correlated with BMI and partially attenuated the association of BMI with AKI after major trauma, suggesting that excess muscle injury may contribute to the association of BMI with AKI.

Quick Shot 22
January 16, 2020
11:21 am

CAN EDUCATIONAL VIDEOS REDUCE OPIOID CONSUMPTION IN TRAUMA INPATIENTS? A CLUSTER-RANDOMIZED PILOT STUDY

Esther S. Tseng, MD*, Brian T Young, MD, Samuel Zolin, MD, Eric Curfman, Nicole Wise, Vetrica Lemaitre, Jeffrey A. Claridge, MD, MS, FACS*, Kristen Conrad-Schnetz, DO*, Vanessa P. Ho, MD, MPH*
MetroHealth Medical Center

Presenter: Esther S. Tseng, MD

Objectives: To determine effect and feasibility of video-based education on trauma inpatient opioid use. We hypothesized that morphine equivalent doses (MEDs) taken by trauma floor patients on the day before discharge would be reduced by 30% and that ≥80% of patients assigned to receive the intervention would view the videos.

Methods: We performed a prospective cluster randomized pilot study of opioid education videos for trauma floor patients. Videos on pain expectations and opioid safety were created. One of two equivalent trauma-credentialed regular nursing floors (RNF) was selected to show the video as the intervention. Patients were equally likely to be admitted to either RNF. Nursing staff were to show videos to English speaking or Spanish-literate patients within one day of RNF arrival, excluding patients with GCS < 15. Clinical characteristics, MEDs taken on the day before discharge, discharge prescriptions, and 30-day pain-related follow-up events were compared. Intention to treat (intervention vs. control) and per-protocol groups (viewed video vs. no video) were compared, alpha=0.05. Protocol compliance was also assessed.

Results: In intention-to-treat analysis (Table 1), there was no difference in MEDs taken on the day before discharge, discharge opioid prescriptions, or 30-day pain-related follow-up. Per-protocol analysis (Table 2) also showed no significant difference in outcomes. Protocol compliance was poor; only 45.6% of the intervention group saw the videos. Among patients using opioids on the day before discharge, those who saw the videos took fewer MEDs than those who did not (p=0.038).

Conclusions: Video-based education did not reduce inpatient opioid consumption, although there may be benefits in specific subgroups. We must work towards establishing effective methods to educate patients about safe pain management and integrate them into standard workflow.

	Control	Intervention	p
Number of Patients	84	90	
Age (Median [IQR])	67.5 [41.5, 81]	59 [37, 72]	0.049
Male (%)	56 (66.7)	56 (62.2)	0.635
Penetrating Mechanism (%)	5 (6.0)	15 (16.7)	0.033
ISS (Median [IQR])	10 [9, 16]	13 [9, 17]	0.369
ICU Length of Stay (Median [IQR])	0 [0, 2]	0 [0, 2]	0.499
Total Length of Stay (Median [IQR])	5.50 [4, 8.25]	5 [4, 8]	0.69
MEDS Consumed Day Before Discharge (Median [IQR])	15 [0, 41.25]	17.5 [0, 47.25]	0.446
Opioids Prescription Given at Discharge (%)	48 (57.1)	54 (60.0)	0.759
MEDs Prescribed at Discharge (Median [IQR])	210 [135, 210]	210 [150, 210]	0.264

Table 1 – Intention-to-Treat Analysis

	Did Not See Videos	Saw Videos	p
Number of Patients	133	41	
Age (Median [IQR])	60 [37, 78]	63 [53, 72]	0.56
Male (%)	86 (64.7)	26 (63.4)	1
Penetrating Mechanism (%)	12 (9.1)	8 (19.5)	0.091
ISS (Median [IQR])	13 [9, 17]	10 [5, 14]	0.025
ICU Length of Stay (Median [IQR])	0 [0, 2]	0 [0, 1]	0.355
Total Length of Stay (Median [IQR])	6 [4, 9]	5 [3, 8]	0.265
MEDS Consumed Day Before Discharge (Median [IQR])	20 [0, 60]	15 [0, 32.5]	0.166
Opioids Prescription Given at Discharge (%)	75 (56.4)	27 (65.9)	0.365
MEDs Prescribed at Discharge (Median [IQR])	180 [127.5, 210]	210 [195, 217.5]	0.066

Table 2 – Per-Protocol Analysis

Quick Shot #23
January 16, 2020
11:27 am

THE SCALES OF RECOVERY: BALANCING POSTTRAUMATIC STRESS WITH RESILIENCE IN THE VIOLENTLY INJURED

Andrew Wheeler, LCSW, Leah C. Tatebe, MD FACS*, Eleanor Clifford, BS, Saclarides Constantine, MD, Emily Deyo, MSW, Annie Guedikian, BS, Erik Liesen, MA, Sydney Pekarek, BS, Nandini Rajaram Siva, MBBS, Caroline Butler, MD*, Matthew Kaminsky, MD*, Thomas A. Messer, MD*, Victoria Schlanser, DO*, Frederic L. Starr, MD*, Carol Reese, Faran Bokhari, MD, MBA, FACS, FACP*, Andrew J. Dennis, DO, FACS, FACOS*
Stroger Cook County Hospital

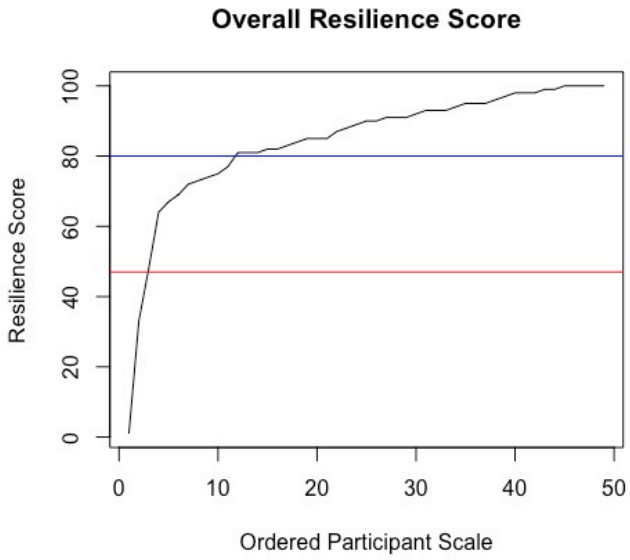
Presenter: Andrew Wheeler, LCSW

Objectives: In order to improve services that promote the emotional healing process of violently injured patients, we sought to assess resilience and contributory factors among adult victims of penetrating trauma caused by interpersonal violence.

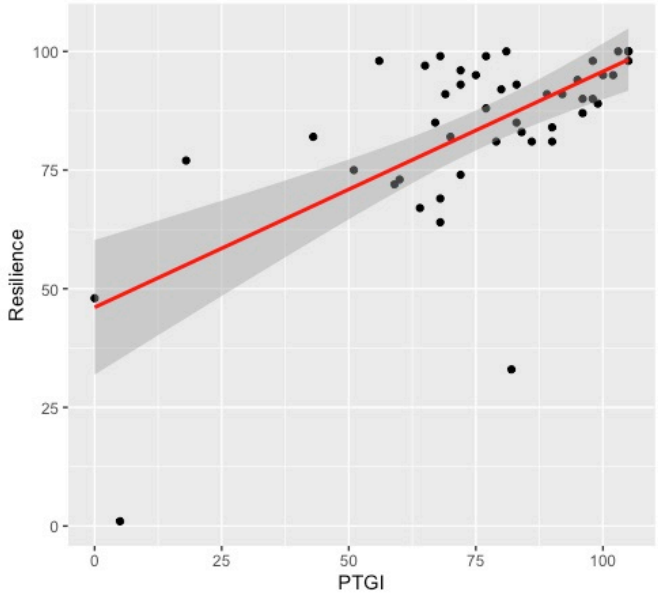
Methods: Adults who presented with non-accidental penetrating trauma to an urban Level 1 trauma center and were at least one month but no more than 12 months from their injury were eligible. Participants completed the Connor-Davidson Resiliency Scale, Post-Traumatic Growth Inventory (PTGI), Primary Care Post-Traumatic Stress Disorder (PC-PTSD) Screen, and a community violence exposure screen. Possible contributing factors were collected including age, injury severity score (ISS), length of stay (LOS), number of surgeries, and time from injury.

Results: 55 participants have been enrolled thus far with a mean resiliency score of 84.1 (SD 18.2). 77.5% of respondents scored higher than what has been reported in the general population, and 95.9% scored higher than reports among those with PTSD (Figure 1). The mean PTGI score was 78.7 (SD 20.8), with 94% scoring above 45 which represents significant growth. 54% screened positive on the PC-PTSD and report high levels of exposure to community violence with 94.3% having had a close friend or family member killed. Resiliency did correlate with PTGI ($p < 0.001$, Figure 2). Resiliency did not correlate with PTSD score, exposure to violence, or any other evaluated factor.

Conclusions: Victims of violent injury experience a myriad of traumatic events yet are highly resilient and exhibit traits of growth across multiple domains. Assessing for resilience provides useful results to inform treatment options that may be otherwise missed. Considering the lack of correlation found with known variables, further investigation is needed to determine other contributing factors that positively reinforce resiliency among violently-injured patients and could be generalizable to other patient populations.



Ordered resiliency scores of study participants compared to general population (top, blue line) and treatment seeking patients with PTSD (bottom, red line).



Positive correlation between scores on Connor Davidson Resiliency Scale and Post-Traumatic Growth Inventory (PTGI) with a linear regression fit ($p < 0.001$).

Quick Shot #24
January 16, 2020
11:33 am

RACIAL INEQUALITY IN THE TRAUMA OF WOMEN: A DISPROPORTIONATE DECADE

Shawn Izadi, BS, Niral Patel, BBA, Julie Whitis, MD,
Demba Fofana, PhD, Samuel Snyder, MD, Jeffrey J. Skubic, DO*
The University of Texas Rio Grande Valley School of Medicine

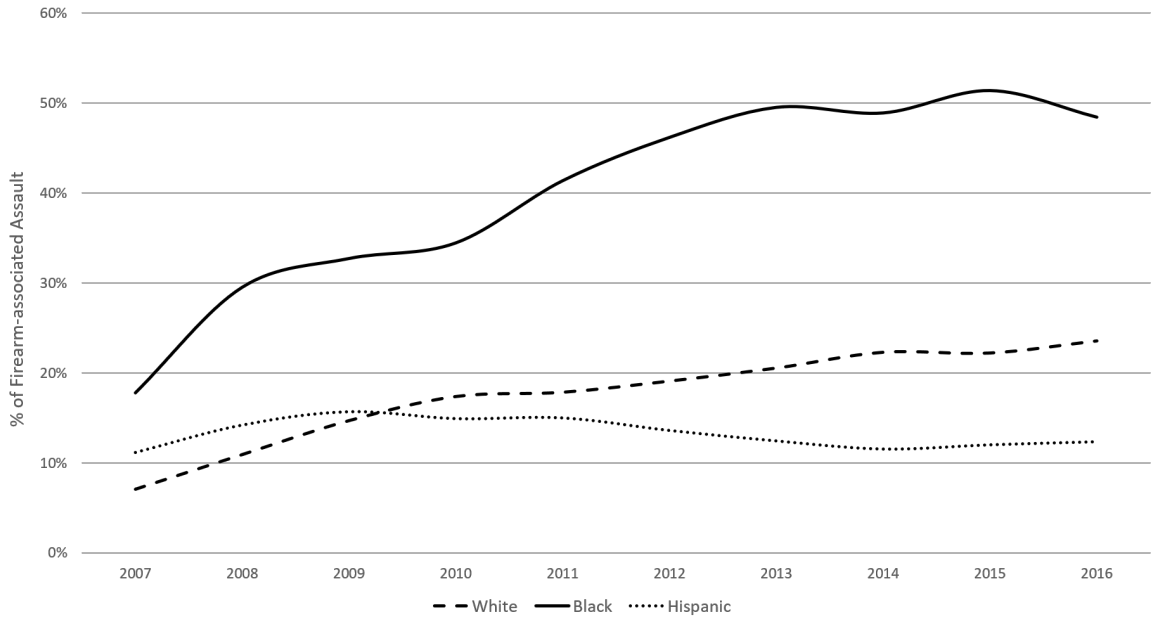
Presenter: Shawn Izadi, BS

Objectives: We sought to: (1) evaluate the most common mechanisms of injury experienced by women; and (2) characterize ethno-demographic trends in regard to intent of injury over a 10-year period.

Methods: A 10-year review (2007-2016) of the National Trauma Data Bank (NTDB) was conducted to identify common mechanisms of injuries among women. Pearson Chi Square tests were performed to identify differences in temporal trends amongst racial groups. Data was analyzed corresponding to demographics and intent of injury.

Results: Between 2007 and 2016, 1,650,496 women presented secondary to a trauma. Most presented due to an unintentional mechanism (93%) while fewer presented secondary to an assault (6%), self-inflicted injury (1%), or other mechanism (<1%). Among this population, White women incurred 56% of related traumas while Black and Hispanic women each represented 6%. Although racial/ethnic minority women represented a small percentage of total traumas, they accounted for roughly 1 in 2 assault-related traumas ($p<0.05$). Compared to White women, firearm-associated assault was 2.3 times more prevalent among Black women ($p<0.001$). Though assaults decreased by 43% during this study period, Black women saw a 40% increase in total assaults. Specifically, Black women saw a 172% increase in firearm-associated assaults.

Conclusions: Compelling data highlights a paradoxical trend in respect to the decrease in total assault-related traumas in women compared to its increase in Black women. Further studies are essential to help understand and subsequently provide social and preventative services for the diverse population of women in the United States.



Trends of firearm-associated assault stratified by race.

Quick Shot #25
January 16, 2020
11:39 am

DOWNSTREAM EFFECTS OF A COMPREHENSIVE TRAUMA RECOVERY SERVICES PROGRAM

Vanessa P. Ho, MD, MPH*, Mark Kalina Jr., BA, Belinda DeMario, BA, Evelyn Truong, BS, Sarah Hendrickson, MEd, Christina Ragone, MPH, BSN, RN, CCRN, Esther S Tseng, MD*, Jeffrey A. Claridge, MD, MS, FACS*, Heather Vallier, MD
MetroHealth Medical Center

Presenter: Vanessa P. Ho, MD, MPH

Objectives: To ascertain whether participation in a comprehensive Trauma Recovery Services (TRS) program can reduce trauma survivor emergency department (ED) recidivism and facilitate in-network follow-up after injury. We hypothesized TRS participants would have with greater downstream non-emergent use of our hospital system, manifested by lower ED charges and higher non-ED charges in the year following admission.

Methods: Our Level 1 Trauma Center's TRS program connects patients and families with resources including education, peer mentors, and a support network. We retrospectively studied trauma inpatients (3/2017-3/2018) offered TRS who survived their index admission. Injury characteristics, TRS registry data and hospital system charges were compared between TRS participants and non-participants. The main outcome of interest was cumulative ED and non-ED charges for the 1 year following index admission. Non-ED charges encompassed outpatient and subsequent admission charges. Charges were assessed using multivariable regression.

Results: 587 patients were identified: 70% male, 26% penetrating. Aggregate charges for this cohort were $81 million, of which $32 million occurred after the index admission. 399 (68%) patients participated in TRS; all but one received education and 362 (91%) had peer mentoring. TRS participants were older, more severely injured, had fewer penetrating injuries, and had longer index LOS (Table 1). 510 (87%) had at least 1 subsequent encounter; 175 (29%) returned to the ED. Non-ED charges were associated with ISS and index LOS, but not TRS. ED charges were significantly lower for TRS participants (Table 2).

Conclusions: A comprehensive TRS program including education, peer mentors, and a support network may provide value to the patient and the healthcare system by reducing subsequent care provided by the ED in the year after a trauma without affecting non-emergent care.

Table 1. Trauma Recovery Services (TRS) Participants vs. Non-Participants

Factor	Bivariate Comparison		
	No TRS n=188	TRS n=399	p-value
Age	31 (24-48)	46 (27-59)	<0.0001
Female	43 (23%)	133 (33%)	0.01
Penetrating	82 (44%)	70 (17.5%)	<0.0001
Injury Severity Score	10 (9-14)	14 (10-21)	<0.0001
Hospital LOS	3 (2-6)	7 (4-11)	<0.0001
Any ED Visit	70 (37%)	105 (26%)	0.007
Charges, $			
Index Admission	43,602 (24,777-68,218)	71,473 (44,380-116,686)	<0.0001
Subsequent ED	0 (0-3,062)	0 (0-867)	0.006
Subsequent Non-ED	0 (0-1,911)	0 (0-131)	0.07

Median (IQR) or N (%); p-values determined by Wilcoxon Rank Sum or Chi-Square. LOS=Length of Stay, ED=Emergency Department

Table 2. Linear Regression of Charges

Factor	ED Charges, $			Non-ED Charges, $		
	β	95% CI	p-value	β	95% CI	p-value
Age	-26	-58 – 4	0.09	-118	-530 – 294	0.57
Penetrating	501	-821 – 1,822	0.46	8,648	-9,038 – 26,334	0.34
Female	-778	-1,958 – 401	0.20	2,061	-13,724 – 17,848	0.80
TRS	-1,472	-2,701 – -244	0.02*	-4,113	- 20,554 – 12,328	0.62
ISS	1	-65 – 67	0.98	1,426	546 – 2,305	0.001*
LOS	6	-63 – 74	0.87	1,685	766 – 2,605	<0.001*

TRS=Trauma Recovery Services, ISS=Injury Severity Score, LOS=Length of Stay, ED=Emergency Department

Quick Shot #26
January 16, 2020
11:45 am

FEASIBILITY OF A TRAUMA QUALITY OF LIFE FOLLOW UP CLINIC

Colleen M. Trevino, NP, PhD*, Timothy Geier, PhD, Sydney Timmer-Murillo, PhD, Matthew Shawlin, MSW, David J. Milia, MD*, Panna Codner, MD, Terri deRoon-Cassini, PhD
Medical College of Wisconsin

Presenter: Colleen M. Trevino, NP, PhD

Objectives: Little effort has been made to address long-term quality of life (QOL), chronic pain(CP), post-traumatic stress disorder (PTSD), and functional disability in trauma survivors. This quality initiative was developed to determine feasibility of a coordinated, comprehensive, patient-centered follow up clinic for those at risk for poor long-term outcomes.

Methods: A convenience sample from 649 hospitalized trauma patients at a Midwestern level 1 trauma center between 2/2018 and 8/2018 was screened for risk of PTSD and CP. 36 patients were randomized into a standard follow up clinic (SOC) (2-week post-discharge surgical clinic) or a new trauma quality of life clinic (TQOL). The TQOL was developed to provide comprehensive care to patients at high risk for PTSD (Injured Trauma Survivor Score ≥2) and/or CP (discharge pain score ≥4). TQOL included a nurse practitioner or surgeon(NP/MD), psychologist, social worker, and physical therapist at one-week post discharge. All providers saw the patient independently, developed a care plan collaboratively, and communicated the plan to the patient. The SOC involved a visit only with an NP/MD. Measures of pain, PTSD, depression, QOL, physical functioning, and life satisfaction were completed at time of the TQOL/SOC or over the phone.

Results: There were no differences in demographics, readmissions, or emergency department visits after discharge between groups (Fig.1). However, no show rates were almost twice as high in SOC (40%) compared to TQOL (22%) and those in TQOL completed 23 additional psychology visits versus one psychology visit in SOC (Fig. 2). This clinic structure is feasible for high risk patients and TQOL patients demonstrated improved engagement in their care.

Conclusions: A comprehensive multidisciplinary TQOL addressing issues affecting convalescence for trauma patients at high risk for developing PTSD and CP can improve follow up rates to ensure patients are recovering successfully.

Figure 1: Demographics, readmissions, or emergency department visits after discharge

	TQOLc (N=18)	SOC (N=18)	P (*significant)
Injury Severity Score	12.13 (SD=6.5)	12.11 (SD= 8.3)	0.99
Discharge Pain	6.6 (SD=2.2)	5.89 (SD=1.4)	0.26
Age	38	35.7	0.23
Injured Trauma Survivor Score Total	228	374	0.35
Readmission	3	4	0.39
Emergency Department visits	7	6	0.97

*p<0.5

Figure 2: Post-Discharge Clinic Follow-up Visits

	TQOL	SOC
Total number of trauma visits	22	9
Total number of additional Psychology visits	23	1

Quick Shot #27
January 16, 2020
11:51 am

MAKING THE NEWS: VICTIM CHARACTERISTICS ASSOCIATED WITH MEDIA REPORTING ON FIREARM VIOLENCE

Elinore J. Kaufman, MD*, Jesse Passman, MD, MPH, Sara Jacoby, PhD,
Daniel N. Holena, MD, MSCE*, Mark J. Seamon, MD, FACS*,
Jim MacMillan, BS, Jessica H. Beard, MD, MPH*
Lewis Katz School of Medicine at Temple University

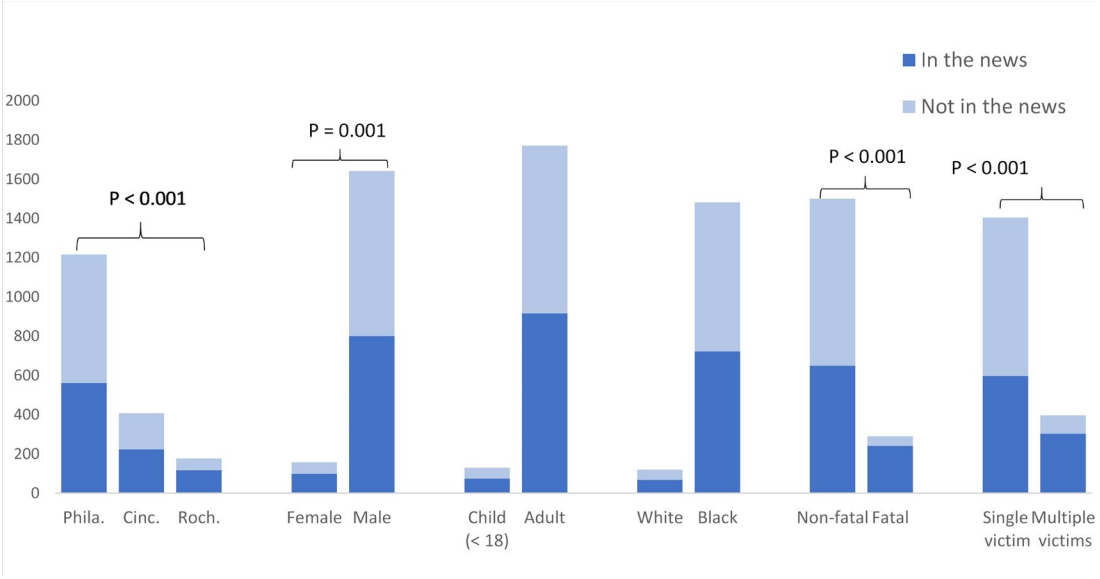
Presenter: Elinore J. Kaufman, MD

Objectives: Firearm violence is increasingly seen as a public health crisis in the United States, but the public may not have a comprehensive understanding of this epidemic. Limited media coverage may contribute to limited public understanding. We analyzed media coverage of firearm assaults (FAs) in 3 U.S. cities. We hypothesized that multiple shootings and fatal shootings would be more likely to make the news, as would shootings affecting children, women, and white individuals.

Methods: The Gun Violence Archive (GVA) is an online repository of FAs collected from local, regional, and national media sources in the US. We compared GVA to police department (PD) FA data for 2017 in 3 cities with detailed, publicly available PD data: Philadelphia, PA, Rochester, NY, and Cincinnati, OH. We assumed that PD data included all FAs for each jurisdiction and that GVA data included all FAs reported in the media. GVA data were matched to PD data by date, location, victim age, and sex. Matched victims were compared to unmatched victims using chi^2 tests for categorical variables and Kruskal-Wallis tests for nonparametric continuous variables.

Results: Philadelphia PD reported 1,216 FA victims in 2017; Cincinnati PD reported 407; and Rochester PD reported 178. Media covered 562 (46.2%), 222 (54.6%), and 116 (65.2%), respectively ($p<0.001$). Fatal shootings were significantly more often reported as were shootings with multiple victims or women (Figure). Of 120 total white victims, 56.7% made the news compared to 48.7% of 1,482 Black victims, $p = 0.09$.

Conclusions: A large proportion of shootings never make the news, which may limit public understanding of the true burden of gun violence. Lack of awareness in turn may hinder support for and implementation of evidence-based approaches to reducing gun violence. Researchers and policy makers should collaborate with journalists and editors to improve public awareness of firearm violence.



Number of firearm assaults reported in the media by victim characteristics, 2017

Quick Shot #28
January 16, 2020
11:57 am

FLAIM: A DEEP NEURAL NETWORK (DNN) BASED APPROACH TO EARLY PREDICT MORTALITY IN TRAUMA PATIENTS ADMITTED TO THE ICU

Fahad S. Ahmed, MD, Liaqat Ali, PhD Student, Bellal Joseph, MD*, Ahmed Chan, PhD
Yale School of Medicine

Presenter: Fahad S. Ahmed, MD

Objectives: Trauma patients admitted to critical care are at high risk of mortality because of their injuries. We integrated a machine learning based framework (FLAIM) to both validate and predict risk factors through a deep neural network. We hypothesized machine learning could be applied to critically ill trauma patients.

Methods: The FLAIM works in two phases. In the first phase, we statistically analyzed the publicly available MIMIC III v1.4 dataset which is developed by MIT Lab for health data in critically ill patients. We applied univariate and multivariate analyses to generate hazard ratios and to rank the trauma associated risk factors. In the second phase, we applied deep neural network models to predict mortality. Additionally, we compared the performance of our proposed system by using popular machine learning models such as Linear Discriminant Analysis, Gaussian Naive Baye, etc.

Results: There were 3022 trauma patients with an average age > 18 years. We observed a number of significant parameters which were: Serum anion gap (HR 2.46, CI 1.94-3.11), sodium (HR 2.11, CI 1.61-2.77) and chloride (HR 2.11, CI 1.69-2.64) abnormalities on labs. After calculating clinical parameters we included the Diagnosis of sepsis (HR 2.03, 95%CI 1.23-3.37), qSOFA score (HR 1.52, CI 1.32-3.76) and SIRS criteria (HR 1.41, CI 1.24-1.26) presented in Table1. We then applied multiple machine learning models to these significant data and we found that the proposed Deep Neural Network (DNN) outperformed all the other methods with test set accuracy of 92.25%, the sensitivity of 79.13% and specificity 94.16% all the rest of the algorithms TABLE 2.

Conclusions: The applicability of machine learning can lead to immediate processing of clinical data to potentially drive clinical practice. FLAIM model based on deep learning is superior to other predictive models and can be applied to trauma data to predict outcomes.

Risk factors		Reference ranges	Units	n (abnormal levels)	%	Univariate			Multivariate		
						p-value	HR	95%CI	*p*-value	HR	95%CI
Chemistry	Sodium	135-145	mEq/L	299	9.8	*<0.001	2.475	1.89-3.24	*<0.001	2.114	1.61-2.77
	Potassium	3.5-5.5	mmol/L	275	9.0	*<0.05	1.444	1.03-2.02	0.053	1.399	1.00-1.97
	Chloride	97-107	mEq/L			*<0.001	2.055	1.65-2.56	*<0.001	2.110	1.69-2.64
	Bicarbonate	23-29	mEq/L	1177	38.7	*<0.001	2.215	1.70-2.66	*<0.001	2.085	1.67-2.61
	Blood urea nitrogen	7-20	mg/dL	792	26.0	*<0.001	1.818	1.46-2.27	0.001	1.488	1.18-1.88
	Creatinine	0.6-1.2	mg/dL	663	21.8	*<0.001	1.769	1.41-2.22	*<0.001	1.665	1.32-2.10
	Glucose	72-99	mg/dL	2272	89.4	*<0.01	2.142	1.17-3.91	*<0.05	2.067	1.13-3.78
	Anion Gap	8-16	mEq/L	494	16.2	*<0.001	2.602	2.06-3.29	*<0.001	2.460	1.94-3.11
	Lactate	0.5-1.0	mmol/L	2300	75.6	*<0.001	1.951	1.41-2.70	*<0.001	2.101	1.51-2.93
	Bilirubin	0.1-1.2	mg/dL	137	4.5	*<0.05	1.627	1.11-2.39	0.05	1.474	1.00-2.17
Hemotological	Hematocrit	37-52	%	2007	66.0	0.203	1.178	0.92-1.52	-	-	-
	Hemoglobin	13.5-15.5	g/dL	2425	79.7	*<0.05	1.489	1.06-2.10	0.112	1.328	0.94-1.89
	WBC	4.5-11	1000 cells/mL	1855	61.0	0.922	0.999	0.80-1.25	-	-	-
	Plateletes	150-350	1000 cells/mL	690	22.7	*<0.001	1.646	1.31-2.07	*0.001	1.478	1.18-1.86
Bleeding profile	PTT	25-35	Seconds	1375	45.2	*<0.05	1.304	1.05-1.62	*0.005	1.366	1.10-1.70
	PT	11-13.5	Seconds	1216	40.0	*<0.001	2.156	1.72-2.70	*<0.001	2.081	1.66-2.61
	INR	0.8-1.1		1619	53.2	*<0.001	1.881	1.48-2.40	*<0.001	1.925	1.51-2.46
Albumin		3.5-5.5	g/dL	381	12.5	*<0.005	1.528	1.17-1.99	*<0.05	1.428	1.09-1.87
Clinical Scores											
	Explicit sepsis using ICD-9 codes					*0.002	2.491	1.51-4.11	*0.006	2.032	1.23-3.37
	Angus criteria of sepsis					*0.003	0.671	0.51-0.88	*<0.001	0.617	0.47-0.81
	Acute Physiology Score III					*<0.001	1.040	1.04-1.04	*<0.001	1.038	1.03-1.04
	Logistic Organ Dysfunction System					*<0.001	1.336	1.30-1.37	*<0.001	1.315	1.28-1.35
	Sepsis diagnosis using Martin Sepsis et al					0.817	0.952	0.63-1.45	-	-	-
	Oxford Acute Severity of Illness Score (OASIS)					*<0.001	1.128	1.11-1.14	*<0.001	1.119	1.10-1.13
	Quick Sequential Organ Failure Assessment (qSOFA)					*<0.001	1.648	1.43-1.90	*<0.001	1.521	1.32-1.76
	Simplified Acute Physiology Score (SAPS)					*<0.001	1.223	1.20-1.25	*<0.001	1.205	1.18-1.23
	Simplified Acute Physiology Score II (SAPS II)					*<0.001	1.066	1.06-1.07	*<0.001	1.063	1.06-1.07
	Systemic inflammatory response syndrome (SIRS) criteria					*<0.001	1.380	1.22-1.56	*<0.001	1.414	1.24-1.61
	Sequential Organ Failure Assessment (SOFA)					*<0.001	1.242	1.21-1.28	*<0.001	1.218	1.18-1.26

Table 1. Clinical parameters and their respective Hazard ratios, Confidence intervals and *p*-values.

Method	Training Accuracy (%)	Testing Accuracy (%)	Sensitivity	Specificity
Deep Neural Network (Layer 1 Nodes = 7 & Layer 2 Nodes = 5)	93.84	92.25	79.13	94.16
LDA Model	82.61	81.84	72.17	83.25
GNB Model	81.47	80.07	67.83	81.85
Decision Tree Model (CART)	89.59	100	63.48	93.40
KNN Model	93.30	84.94	66.96	87.56

Table 2. Different Machine learning methods and their respective Training Accuracies, Test set accuracies, Sensitivities and Specificities.

Quick Shot #29
January 16, 2020
12:03 pm

DEATHS FOLLOWING WITHDRAWAL OF LIFE SUSTAINING THERAPY REPRESENT OPPORTUNITIES FOR QUALITY IMPROVEMENT

Matthew P. Guttman, MD, Bourke W. Tillmann, MD,
Barbara Haas, MD, PhD*, Avery B. Nathens, MD, PhD, MPH*
University of Toronto

Presenter: Matthew P. Guttman, MD

Objectives: Risk-adjusted performance benchmarking is useful for identifying quality improvement (QI) opportunities. There is controversy as to whether patients who die following withdrawal of life sustaining therapy (WLST) should be included as deaths, given that they may have survived if patient preferences were different. However, it is possible that some deaths following WLST may be preventable with better care. We explored whether outcomes among those with WLST might be modifiable by evaluating the proportion who died as a result of failure to rescue (FTR).

Methods: Data were derived from the ACS TQIP 2016 cohort. FTR was defined as death following a major complication. To identify potential for QI, we calculated the proportion of deaths following WLST that represented FTR. Risk adjustment models were used to rank hospital performance by quartile. Three different decedent cohorts were used for ranking: 1) all deaths, 2) excluding WLST deaths, and 3) excluding WLST deaths where there was no FTR.

Results: There were 13,607 (5.2%) deaths among 260,159 patients in 447 centers. For all deaths, mean age was 59 years, 69% were male, and median ISS was 25 (Table). Of the 13,607 deaths, 42% occurred after WLST, of which 23% represented FTR. After excluding patients who died following WLST, 32% of centers in the lowest mortality quartile moved to a higher quartile. When excluding those with WLST not classified as FTR, 29% of centers moved to a higher quartile.

Conclusions: Many deaths following WLST represent FTR and are thus potentially preventable. The inclusion of these deaths in benchmarking had an impact on hospital rankings and excluding them would be inappropriate. Deaths following WLST should be evaluated as part of a trauma center?s QI program to determine whether FTR was contributory. ACS TQIP should consider highlighting these patients in benchmarking reports.

	All Deaths n=13,607	Excluding WLST n=7,880	Excluding only WLST without FTR n=9,191
Age in years, mean (SD)	58.7 (22.5)	54.8 (23.4)	56.0 (23.0)
Male gender, n (%)	9399 (69.1%)	5538 (70.3%)	6461 (70.3%)
Race			
White	9734 (71.5%)	5201 (66.0%)	6210 (67.6%)
Black	1993 (14.6%)	1491 (18.9%)	1658 (18.0%)
Other	1424 (10.5%)	908 (11.5%)	1011 (11.0%)
Insurance status, n (%)			
Commercial	3543 (26.0%)	1998 (25.4%)	2405 (26.2%)
Non-commercial	7142 (52.5%)	3738 (47.4%)	4459 (48.5%)
Self-pay	2070 (15.2%)	1555 (19.7%)	1673 (18.2%)
Any comorbidity, n (%)	8640 (63.5%)	4328 (54.9%)	5344 (58.2%)
Mechanism of injury, n (%)			
Fall	6088 (44.7%)	2923 (37.1%)	3517 (38.3%)
MVC	3006 (22.1%)	1859 (23.6%)	2234 (24.3%)
Other blunt	2263 (16.6%)	1401 (17.8%)	1644 (17.9%)
Firearm	2063 (15.2%)	1541 (19.6%)	1627 (17.7%)
Other penetrating	187 (1.4%)	156 (2.0%)	169 (1.8%)
ISS, median (IQR)	25 (16)	25 (17)	25 (17)
AIS ≥ 3, n (%)			
Head	8870 (65.2%)	4617 (58.6%)	5318 (57.9%)
Chest	4742 (34.8%)	3053 (38.7%)	3632 (39.5%)
Abdomen	1824 (13.4%)	1310 (16.6%)	1522 (16.6%)
Level I trauma center	8763 (64.4%)	4952 (62.8%)	5853 (63.7%)

Table: Characteristics of all mortalities, all mortalities excluding WLST, and all mortalities excluding those WLST that did not follow a major complication (FTR).

Quick Shot #30
January 16, 2020
12:09 pm

NO NEWS IS GOOD NEWS? THE 3-YEAR MORTALITY RATES OF OCTOGENARIAN AND NONAGENARIAN PATIENTS FOLLOWING EMERGENCY GENERAL SURGERY

John Hwabejire, MD, MPH, Natawat Narueponjirakul, MD, Manasnun Kongwibulwut, MD, Jae Moo Lee, BA, Napaporn Kongkaewpaisan, M.D., George Velmahos, MD, PhD, MSEd, Peter Fagenholz, MD, David King, MD*, Noelle Saillant, MD*, April E. Mendoza, MD, MPH*, Martin Rosenthal, MD, Haytham Kaafarani, MD, MPH*
Massachusetts General Hospital

Presenter: John Hwabejire, MD, MPH

Objectives: Outcome data on the very elderly patients undergoing emergency general surgery (EGS) are sparse. We sought to examine short and long-term mortality in the 80+ population following EGS.

Methods: Using our institutional 2008-2018 EGS Database, all the 80+ patients undergoing EGS were identified. The data were linked to the Social Security Death Index to determine cumulative mortality rates up to 3 years after discharge. Univariate and multivariable logistic regression analyses were used to determine predictors of in-hospital and 1-year cumulative mortality.

Results: A total of 385 patients were included with a mean age of 84; 54% were female. The 2 most common comorbidities were hypertension (76.1%), and cardiovascular disease (40.5%). The most common procedures performed were colectomy (20.0%), small bowel resection (18.2%), and exploratory laparotomy for other procedures (15.3%; e.g. internal hernia, perforated peptic ulcer). The overall in-hospital mortality was 18.7%. Cumulative mortality rates at 1, 2, and 3 years after discharge were 34.3%, 40.5%, & 43.4%, respectively [Fig. 1]. The EGS procedure associated with the highest 1-year mortality was colectomy (49.4%). Although hypertension, renal failure, hypoalbuminemia, and elevated liver enzymes predicted in-hospital mortality, the only independent predictors of cumulative 1-year mortality were hypoalbuminemia (OR 2.17, 95%CI 1.10-4.27; p= 0.025), and elevated serum SGOT level (OR 2.56, 95%CI 1.09-4.70; p=0.029) at initial presentation. Patients with both factors had a cumulative 1-year mortality rate of 75.0%.

Conclusions: More than half of the very elderly patients undergoing major EGS were still alive at 3 years post-discharge. The combination of hypoalbuminemia and elevated liver enzymes predicted the highest 1-year mortality. Such information can prove useful for patient and family counseling preoperatively.

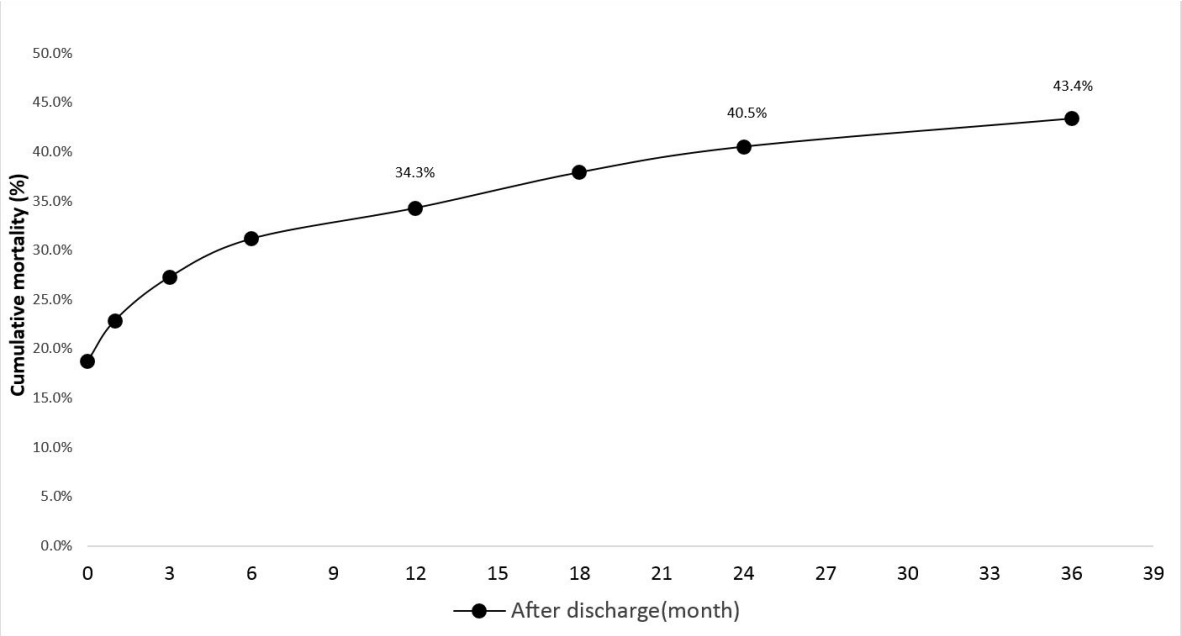


Figure 1: Cumulative Post-discharge Mortality Rates

Quick Shot #31
January 16, 2020
11:15 am

IDENTIFICATION OF A NEW GENETIC VARIANT ASSOCIATED WITH CHOLECYSTITIS: A MULTICENTER GENOME-WIDE ANALYSIS

Apostolos Gaitandis, MD, Alexander Bonde, BSc, Majed el Hechi, MD, Charlie Nederpelt, BSc, Nikos Kokoroskos, MD, April E. Mendoza, MD, MPH*, George Velmahos, MD, PhD, MSEd, Martin Sillesen, MD, Maha Farhat, MD, MSc, Haytham Kaafarani, MD, MPH*
Massachusetts General Hospital

Presenter: Apostolos Gaitandis, MD

Objectives: The genomic landscape of gallbladder disease remains poorly understood. We sought to examine the association between common genetic variants and the development of cholecystitis.

Methods: We used the 2015-2018 biobank of a large multi-institutional health-system. All patients with cholecystitis were identified using ICD codes and genotyped across five batches. For each batch, the single nucleotide polymorphism (SNP) data was cleaned, SNP status at additional sites was imputed, and the results were analyzed separately to avoid batch effects. The genomic ancestry of the target population was characterized by calculating multidimensional scaling components and anchoring the results in a population of known ethnic structure. To control for population stratification, we restricted data to that from individuals of Northern European genomic ancestry and delineated genomic correlation using a genetic relatedness matrix. The association between genetic variants and cholecystitis was evaluated by mixed linear models, controlling for age, sex, cholelithiasis, and obesity.

Results: From a total of 24.644 patients, 20,384 individuals of Northern European genomic ancestry were identified. This subpopulation consisted of 756 cases and 19,628 controls. After meta-analysis, one variant (rs146562173) on chromosome 5p12 exceeded the threshold for genome-wide significance ($p=2.35x10^{-8}$).

Conclusions: In this genome-wide association study we identified a new genetic variant on chromosome 5p12 that could serve as a predictor for the development of cholecystitis.

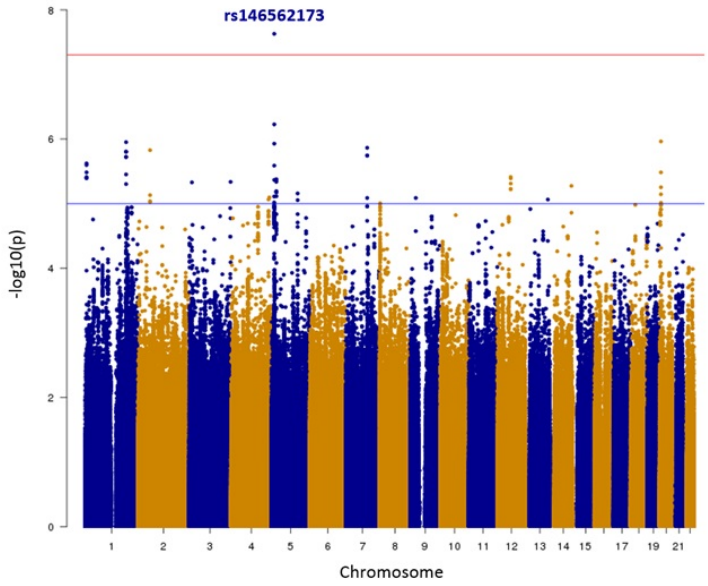


Figure 1: Each point in the Manhattan plot represents a SNP. The X-axis illustrates the chromosomal position and chromosomes are represented with alternating colors. The Y-axis shows the association with cholecystitis (presented as the -log10 of the p-value). The blue line represents the suggestive threshold ($p=5x10^{-5}$), and the red line marks the threshold for genome-wide significance ($p=5x10^{-8}$).

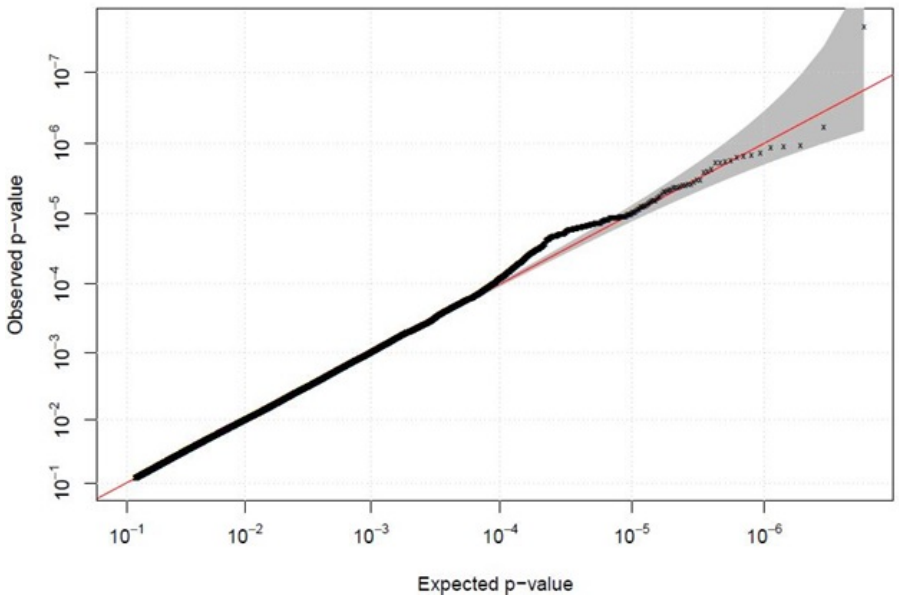


Figure 2: QQ-plot

Quick Shot #32
January 16, 2020
11:21 am

ASSOCIATION BETWEEN HOSPITAL LEVEL COMPUTED TOMOGRAPHY RESOURCES AND OUTCOMES FOR ACUTE ABDOMEN

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

Presenter: Kevin Ricci, MD, MS

Objectives: Patients presenting with abdominal pain often undergo CT scan. We aimed to investigate the relationship between availability, timeliness, and results communication of CT imaging and outcomes for acute abdomen.

Methods: Data from a 2015 national survey of 2,811 hospitals regarding EGS structures and processes (60.1% overall response, N=1,690) were linked to 2015 Medicare inpatient claims data. We identified beneficiaries age =65 admitted emergently with intraabdominal diseases (e.g., perforated viscus, ischemic enteritis) undergoing operative intervention on the same calendar date. Multivariable regression adjusted for significant covariates as appropriate was performed to determine odds of complications and mortality based upon CT resources.

Results: We identified 9,125 acute abdomen patients treated at 1,253 hospitals of which 77.7% had =64 slide CT scanners and 85.1% had 24/7 CT techs. Overnight CT reads were provided at 14.1% by in-house radiologists and at 66.2% by tele-radiologists. Patients were predominantly 65-74yo (42.6%), female (60.4%), white (87.8%) and had =3 comorbidities (67.1%). 44.2% experienced =1 surgical complication, 48.0% =1 systemic complication, and 8.6% died. Results of the multivariable analysis can be seen in Table 1. STAT radiology reads by a board certified radiologist Rarely/Never available in 2 hours was associated with increased systemic complications and mortality (aOR 2.6 [1.3-5.4] and 2.3 [1.1-4.8], respectively).

Conclusions: Even with widespread availability of CT scans and radiology staff, delays in communicating results is associated with adverse outcomes. This may be attributable to delays in surgical consultation and time to source control for acute abdomen. Processes to ensure timely communication of critical CT scan results in patients with abdominal pain may improve outcomes in high risk patients.

Table. Odds of post-operative complications and mortality among Medicare Beneficiaries admitted to 1253 US hospitals for acute abdomen in 2015.

	Major Operative Complication*		Major Systemic Complication *		Mortality**	
	OR [95% CI]	aOR [95% CI]	OR [95% CI]	aOR [95% CI]	OR [95% CI]	aOR [95% CI]
Advanced Abdominal Imaging Equipment						
CT scan (N = 8,888)						
≥64 slice	-	-	-	-	-	-
<64 slice	1.20 [0.99,1.45]	1.20 [0.99,1.46]	0.93 [0.77,1.13]	0.92 [0.75,1.13]	0.89 [0.70,1.13]	0.90 [0.69,1.16]
None	0.65 [0.42,1.00]	0.65 [0.42,0.99]	0.89 [0.59,1.34]	0.91 [0.60,1.38]	0.76 [0.41,1.40]	0.76 [0.41,1.39]
Diagnostic Radiology Staff						
Round the clock CT technicians						
Yes	-	-	-	-	-	-
No	1.18 [0.94,1.48]	1.19 [0.95,1.49]	1.13 [0.90,1.41]	1.14 [0.89,1.45]	0.87 [0.64,1.17]	0.83 [0.61,1.13]
Unsure	1.05 [0.71,1.54]	1.05 [0.71,1.56]	**0.67 [0.45,0.98]**	**0.63 [0.42,0.94]**	0.85 [0.52,1.39]	0.88 [0.54,1.44]
Overnight radiologist presence						
In-house overnight radiologist	-	-	-	-	-	-
Tele-radiologist overnight	1.13 [0.98,1.31]	1.14 [0.99,1.32]	1.00 [0.87,1.16]	1.03 [0.88,1.19]	0.95 [0.80,1.14]	0.96 [0.80,1.16]
No overnight radiologist	1.26 [0.63,2.51]	1.23 [0.62,2.45]	1.61 [0.81,3.18]	1.59 [0.78,3.24]	1.29 [0.54,3.07]	1.10 [.47,2.59]
Timeliness of Diagnostic Radiology Services						
Stat CT scan completed ≤4hrs of being ordered						
Always/Often	-	-	-	-	-	-
Sometimes	1.07 [0.79,1.44]	1.05 [0.78,1.43]	0.81 [0.60,1.09]	0.76 [0.56,1.05]	0.88 [0.59,1.34]	0.90 [0.59,1.38]
Rarely/Never	1.35 [0.66,2.78]	1.33 [0.65,2.70]	1.81 [0.87,3.75]	1.80 [0.82,3.92]	1.29 [0.53,3.12]	1.10 [0.43,2.80]
Stat imaging read by board-certified/eligible radiologist ≤2hrs of completion						
Always/Often	-	-	-	-	-	-
Sometimes	0.96 [0.78,1.19]	0.98 [0.79,1.20]	0.93 [0.76,1.14]	0.98 [0.79,1.20]	0.85 [0.65,1.19]	0.90 [0.68,1.20]
Rarely/Never	1.01 [0.51,2.00]	1.01 [0.51,2.01]	**2.29 [1.12,4.67]**	**2.59 [1.25,5.40]**	**2.33 [1.11,4.86]**	**2.25 [1.05,4.84]**
Critical results communicated directly to surgeons						
Always/Often (ref)	-	-	-	-	-	-
Sometimes	0.99 [0.84,1.17]	0.99 [0.83,1.17]	1.15 [0.98,1.35]	1.13 [0.95,1.35]	1.26 [1.03,1.53]	1.22 [0.99,1.51]
Rarely/Never	1.04 [0.78,1.40]	1.06 [0.79,1.42]	1.27 [0.95,1.70]	1.36 [1.00,1.85]	0.93 [0.65,1.33]	0.91 [0.62,1.34]

* Adjusted for age and comorbidities.

**Adjusted for any major operative complication, any major systemic complication, age, and comorbidities.

BOLD results text = significant odds ratio.

Quick Shot #33
January 16, 2020
11:27 am

THE BURDEN OF ENTEROCUTANEOUS FISTULA AFTER EMERGENCY SURGERY DISCHARGE: MORTALITY AND READMISSION RATES

Justin Hatchimonji, MD, MBE*, Jesse Passman, MD, MPH, Elinore J Kaufman, MD*,
Catherine Sharoky, MD, MSCE, Lucy Ma, Dane Scantling, DO, MPH,
Aria Xiong, MS, Daniel N. Holena, MD, MSCE*
Hospital of the University of Pennsylvania

Presenter: Justin Hatchimonji, MD, MBE

Objectives: The burden of enterocutaneous fistula (ECF) after emergency general surgery (EGS) has not been rigorously characterized. Using a nationally representative dataset, we set out to describe 30- and 90- day readmission and mortality rates of ECF after gastrointestinal EGS. We hypothesized that ECF would be associated with higher rates of post-discharge mortality and readmissions.

Methods: Using the 2016 National Readmission Database, we conducted a retrospective study of adults presenting for gastrointestinal EGS, defined as non-elective admissions with ICD-10 procedure codes 75 (small bowel resection), 78 (colorectal resection), 86 (other hernia repair), 87 (laparoscopy (GI only)), 89 (exploratory laparotomy), or 90 (excision; lysis of peritoneal adhesions) occurring on hospital day 0 or 1. We used ICD-10 diagnosis code K63.2 (fistula of intestine) to define postoperative fistula. To measure readmissions, we used 30- and 90- day rates censuring discharges occurring in December or from October-December, respectively.

Results: 94,897 patients underwent emergency surgery during the study period, of whom 1,396 (1.5%) developed ECF. Mortality was higher in patients who developed ECF than in those who did not (11.5% vs. 6.6%; OR 1.82, 95% CI 1.54-2.16) in patients who survived the index admission. The development of ECF was associated with multiple readmissions. Readmission rates were considerably higher for patients with ECF than without at 30 days (25.2% vs. 13.6%; OR 2.13, 95% CI 1.85-2.46) and at 90 days (41.6% vs. 21.9%; OR 2.54, 95% CI 2.22-2.91).

Conclusions: The development of ECF after gastrointestinal EGS is associated with significantly increased odds of both mortality and readmission, rates of which continue to climb out to at least 90 days. Processes of care designed to mitigate risk in this high-risk cohort should be developed.

Quick Shot #34
January 16, 2020
11:33 am

ADMISSION PREDICTORS OF MORTALITY AND LIMB LOSS FOLLOWING NECROTIZING SOFT TISSUE INFECTION

Dara L. Horn, MD, Jolie Shen, BS, Emma Roberts, BA, Theresa N. Wang, MD, Kevin S. Li, MS, Grant E. O'Keefe, MD, MPH, Eileen M. Bulger, MD, FACS*, Bryce R.H. Robinson, MD, MS, FACS, FCCM*
University of Washington

Presenter: Dara L. Horn, MD

Objectives: Necrotizing soft tissue infections (NSTI) are the most severe manifestation of soft tissue infection and carry significant morbidity and mortality. While the mortality for this disease has improved over time, understanding the risk factors for death and amputation may guide expedited care and goals of care discussions. We sought to identify risk factors for death and extremity loss in a large, single-institution cohort.

Methods: We analyzed prospectively collected data of patients >18 years old with surgically confirmed NSTI from a registry maintained at a single Level 1 trauma center. Analyses included demographic variables, disease characteristics and microbiology, and outcomes. Factors associated with mortality and amputation were identified using multiple logistic regression.

Results: Between January 2013 and September 2018, 430 infections were identified. The median age was 55, 65% were male, and 77% were white, and 14% involved injection drug use. The majority (89%) were transferred from an outside facility. 50% involved an extremity, 37% the perineum, and 16% the abdomen or chest. The median number of operative debridements was 3 [IQR 2,4], and the median hospital LOS was 18 days [IQR 10,30]. 78% of patients had a positive wound culture, 79% were polymicrobial, 3% involved Clostridium, and 21% involved Group A Streptococcus. Overall mortality was 14%, and 21% of extremity NSTI required amputation. Factors that were independently associated with mortality and amputation are listed in Tables 1 and 2 respectively.

Conclusions: Though a heterogeneous disease state, NSTI have discrete patient and disease characteristics associated with mortality and limb loss. These variables can assist the acute care surgeon in expediting care for these high-risk patients and in goals of care discussions with next of kin. Further work is needed to define modifiable risk factors and best practices for those with NSTI.

Variable	OR	95% CI	P value
Age > 60	2.37	1.30-4.35	0.005
WBC > 30	2.23	1.11-4.48	0.025
Creatinine > 2	3.96	2.20-7.13	<0.001
Clostridium Involved	7.67	1.73-33.93	0.007
Perineum Involved	0.46	0.23-0.95	0.032

Table 1: Factors independently associated with death.

Variable	OR	95% CI	P value
Age > 60	3.68	1.38-9.78	0.009
Male Sex	4.64	1.75-12.27	0.002
Non-White Race	4.42	1.66-11.75	0.003
Sodium < 130	4.63	1.83-11.73	0.001
Diabetes Mellitus	3.30	1.35-8.06	0.007
Chronic Wound Etiology	5.40	2.01-14.48	<0.001
Leg Involved	5.01	1.37-18.28	0.014
Transferred	6.64	1.37-32.21	0.018

Table 2: Factors independently associated with amputation amongst patients with limb involvement.

Quick Shot #35
January 16, 2020
11:39 am

PLATELET DYSFUNCTION IN PATIENTS WITH TRAUMATIC INTRACRANIAL HEMORRHAGE: DO DESMOPRESSIN AND PLATELET THERAPY HELP OR HARM ?

Nina Glass, MD*, Nina Glass, MD*, Julia Riccardi, Helen Horng, PharmD,
Gregory Kacprzynski, MD, Ziad C. Sifri, MD*
Rutgers-New Jersey Medical School

Presenter: Nina Glass, MD

Objectives: Pre-injury anti-platelet use with aspirin and clopidogrel has been associated with increased risk of progression of traumatic intracranial hemorrhage (ICH) and possible worse outcomes. VerifyNow® assays are point of care tests that assess platelet inhibition to aspirin and clopidogrel. Desmopressin and/or platelet transfusion has been proposed to reverse this platelet inhibition. This study aims to assess the effect administration of desmopressin and platelets on progression of ICH and outcomes of trauma patients with platelet dysfunction.

Methods: We performed a retrospective chart review of consecutive trauma patients with mild TBI (presentation Glasgow Coma Score (GCS) 13-15) and ICH at a level 1 trauma center between 1/1/2013 and 6/1/2016. Patients with documented platelet dysfunction (VerifyNow® Aspirin <550 or P2Y12 <250) who received desmopressin and/or platelets were compared patients to those who did not. Primary outcomes were progression of intracranial hemorrhage and neurologic outcomes at discharge.

Results: Of 565 patients with a mild TBI and ICH, 200 patients had a positive VerifyNow® assay. These patients were mostly male and had a median age of 60 and an average ISS of 15 (Table 1). Most (159) underwent a second head CT of which 35% had progression of hemorrhage. Both patients that did and did not receive desmopressin or platelets, had similar baseline GCS, Marshall score, and rate of ICH progression, but the patients who received desmopressin and/or platelets, had worse discharge GCS and Glasgow Outcomes Score (GOS) (Table 2).

Conclusions: Treatment of mild TBI patients with platelet dysfunction identified by VerifyNow® assay with desmopressin and platelets has no effect on ICH progression and is associated with worse neurologic outcomes. Administration of desmopressin or platelets to patients with platelet inhibition and a mild TBI is not beneficial.

Characteristic	VerifyNow® positive
Age Median [IQR]	60 [46.5, 70.5]
Male sex n (%)	141 (70.5)
Blunt mechanism	199
Penetrating (GSW)	1
Blunt mechanism:	
Fall	107 (54)
Assault	44 (22)
Pedestrian Stuck	22 (11)
MVC	17 (9)
Other	9 (5)
Initial GCS 15	144 (72)
Initial GCS 14	42 (21)
Initial GCS 13	14 (7)
ISS Mean (SD; range)	14.7 (7.8; 4-50)
LOS Mean (SD; range)	7.8 (11.7; 1-116)
Hospital disposition	
Home	133 (66.5)
Acute rehab	48 (24)
Other	11 (5.5)
Death	8 (4)

Table 1: Demographics and Injury Characteristics of all Minor TBI patients with VerifyNow® positive
Numbers presented as n (%) unless otherwise stated

	Got desmopressin	No desmopressin	p-Value
Initial GCS 15	51/72 (71)	94/131 (72)	0.89
Initial Marshall 1 or 2	68/72 (94)	115/122 (94)	1.0
Progression of ICH on 2nd CT	32/69 (33)	23/80 (29)	0.03
Discharge GOS>3	67/82 (82)	124/132 (94)	0.006
Discharge GCS>13	59/71 (83)	125/132 (95)	0.01
	Got platelets	No platelets	p-Value
Initial GCS 15	24/34 (71)	7/105 (73)	0.93
Initial Marshall 1 or 2	31/34 (91)	98/102 (96)	0.37
Progression of ICH on 2nd CT	11/29 (38)	25/79 (32)	0.64
Discharge GOS>4	24/34 (71)	97/106 (92)	0.004
Discharge GCS>13	25/33 (76)	99/106 (93)	0.004

Table 2: Outcomes for patients by receipt of desmopressin and/or platelets
Numbers presented as n/denominator (%)

Quick Shot #36
January 16, 2020
11:45 am

EARLY COGNITIVE IMPAIRMENT IS COMMON AFTER INTRACRANIAL HEMORRHAGE WITH MILD TRAUMATIC BRAIN INJURY

Patrick Delaplain, MD, Spencer Albertson, Areg Grigorian, MD,
Barbara Williams, Megan Smith, PhD, Kenji Inaba, MD,
Michael Lekawa, MD, Jeffry Nahmias, MD, MHPE, FACS*
University of California, Irvine

Presenter: Areg Grigorian, MD

Objectives: To determine the incidence of early cognitive impairment (ECI) after traumatic brain injury (TBI) and identify risk factors for its development.

Methods: A single-center, retrospective review of adult trauma patients (2014-2016) with intracranial hemorrhage (ICH) and mild TBI (GCS 13-15) was performed. The primary outcome was ECI, defined as a Rancho Los Amigos Score < 8. Routine cognitive evaluation is performed on all ICH patients at our institution. Comparisons between ECI and no-ECI groups regarding demographic, cognitive, and clinical outcomes were evaluated using bivariate statistics (?2, Fischer's exact, t test). The odds of ECI were evaluated using a multivariable logistic regression.

Results: There were 465 patients with mild TBI, 70.3% were male and the average age was 53+/-23 years. The most common mechanism of injury was fall (41.1%) followed by motor vehicle collision (15.9%). The incidence of ECI was 51.4% (N = 239). The incidence in patients with a GCS of 15 was 42.9% and BIG 1 category was 42.7%. There were no differences in demographics (age, gender, comorbidities), mechanism of injury, or imaging when comparing those with ECI to those with no-ECI. GCS was lower in the ECI group (14.4 vs. 14.7, $p < 0.0001$). Patients with ECI were also less likely to be discharged home (58% vs. 78%, $p<0.0001$). Lower GCS and BIG category 3 (vs. 1) were strong risk factors of ECI in a multiple logistic regression model adjusted for age, loss of consciousness, anticoagulants, and Rotterdam score (**Table 1**).

Conclusions: Half of all patients with ICH and mild TBI had ECI. Both lower initial GCS and BIG category 3 were associated with increased likelihood of ECI. Therefore, we recommend all patients with ICH and mild TBI undergo cognitive evaluation.

Variable	OR	95% CI	P-value
*Age**	1.01	(1.00 - 1.02)	0.066
GCS*	**2.38**	**(1.49 – 3.13)**	**<0.001**
LOC	1.37	(0.86 - 2.21)	0.232
Anticoagulants+	**0.42**	**(0.22 - 0.77)**	**0.005**
Rotterdam score	1.02	(0.73 - 1.43)	0.992
BIG category 2	1.24	(0.69 - 2.24)	0.474
BIG category 3	**2.28**	**(1.28 - 4.13)**	**0.005**

*Odds of ECI with 1-unit increase/decrease of covariable
+Also includes antiplatelet medication
Abbrev: GCS (Glasgow Coma Scale), LOC (Loss of consciousness), BIG (Brain Injury Guideline)

Table 1. Multivariable regression model for likelihood of early cognitive impairment.

Quick Shot #37
January 16, 2020
11:51 am

VENOUS THROMBOEMBOLISM FOLLOWING PENETRATING FEMORAL AND POPLITEAL ARTERY INJURIES: AN OPPORTUNITY FOR INCREASED PREVENTION

Odessa Pulido, DO, Asanthi Ratnasekera, DO, FACOS*, Alicia Lozano, MS,
Danielle Sienko, Sandra Durgin, RN, MSN, Sharon Nichols, Niels D. Martin, MD*
Crozer Chester Medical Center

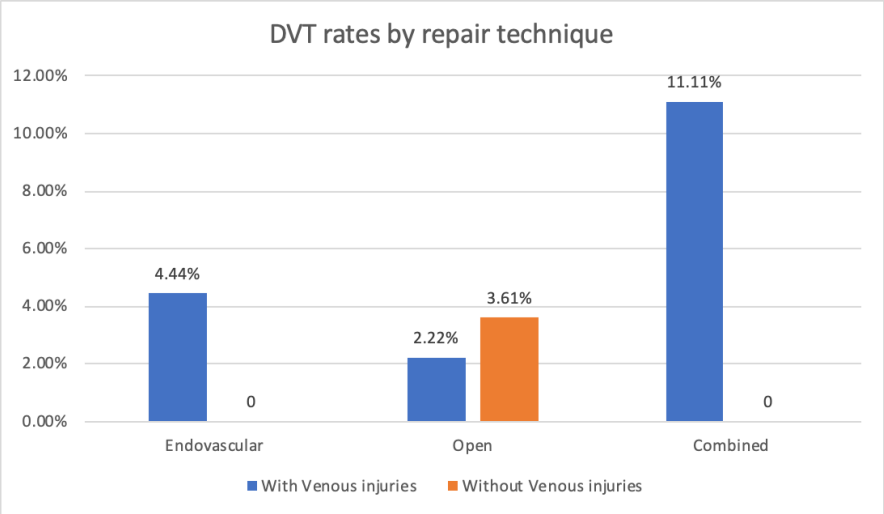
Presenter: Odessa Pulido, DO

Objectives: Due to a multitude of factors, trauma patients at baseline, have an increased risk of venous thromboembolism (VTE). This risk increases with injuries to the vascular system, especially those of a penetrating nature. The purpose of this study is to evaluate VTE rates among open vs. endovascular repair of penetrating vascular injuries to the femoral-popliteal system with specific attention to the association with concomitant venous injuries.

Methods: A retrospective study of the prospectively-collected Pennsylvania Trauma Outcome Study (PTOS) registry was conducted over a 5 year period (2013-2017). All adult patients with a penetrating mechanism and femoral/popliteal vascular injuries were studied. Patient demographics, injury details, and VTE outcomes were evaluated. Secondary endpoints were ICU LOS, Hospital LOS and mortality. Statistical comparisons were accomplished using Fisher's exact tests, and parametric two-sample t-tests or non-parametric Wilcoxon rank-sum tests for categorical and continuous variables, respectively.

Results: There were 865 patients with penetrating extremity vascular injuries. Of those, 128 patients had femoral or popliteal artery injuries. Patients with isolated arterial injuries (n=83) had a significantly lower DVT rate compared to those with concurrent venous injuries(n=45) (3.6% vs.20%, p=0.003). The groups were divided into open, endovascular, and combined repair techniques. Among the 3 patients with isolated femoral or popliteal arterial injuries who had developed DVTs, all had an open repair. Of the 9 patients with concurrent arterial and venous injuries who developed DVTs, 2(4.44%) had endovascular repair, 1 (2.22%) had open repair, 5 (11.11%) had combined repair and 1 did not undergo a repair (Figure 1). ICU LOS (p=0.009), hospital days (p=0.006), and ventilator days (p=0.001) were significantly longer for those with both arterial and venous injuries compared to those with only arterial injuries. ICU LOS (p=0.007), ventilator days (p=0.001), and hospital LOS (p=0.01) were significantly longer for patients with DVT (Table 1).

Conclusions: The DVT rates are higher with concomitant venous injuries in penetrating femoral and popliteal artery trauma. Open repair was associated with significant DVT rates, even without associated venous injury. Consideration should be given for aggressive prophylaxis or empiric full anticoagulation in this subset of patients.



DVT rates by repair technique in patients with concurrent venous injuries and in patients with isolated arterial injuries.

Table 1. Patient Characteristics for those with femoral or popliteal artery injuries by DVT Group

	No DVT (N = 116)	DVT (N = 12)	P-value[1]
ISS, Median (Q1, Q3)	10 (9, 17)	17 (9.5, 23)	0.0767
TRISS, Median (Q1, Q3)	0.990 (0.976, 0.991)	0.974 (0.889, 0.985)	0.0130
AIS, Median (Q1, Q3)	3 (3, 4)	3 (3, 4)	0.1724
ICU LOS, Median (Q1, Q3)	2 (1, 3.5)	5 (2, 7.5)	0.0075
Stepdown LOS, Median (Q1, Q3)	0 (0, 0)	0 (0, 0)	0.9482
Ventilator Days, Median (Q1, Q3)	0 (0, 1)	1.5 (1, 3.5)	0.0010
Hospital LOS, Median (Q1, Q3)	10.5 (5.5, 16)	17.5 (12.5, 26.5)	0.0119
SBP, Mean (SD)	117.63 (32.9)	106.25 (31.2)	0.2543
HR, Mean (SD)	97.52 (26.1)	113.36 (31.1)	0.0605
GCS, Median (Q1, Q3)	15 (15, 15)	15 (13, 15)	0.4656
Age, Median (Q1, Q3)	26 (21, 34)	23 (22, 48)	0.9771
Blood Unit, Median (Q1, Q3)	0 (0, 2)	1 (0, 2.5)	0.0883
MTP, n (%) *(n=31)*	2 (7.4%) *(n=27)*	4 (100%) *(n=4)*	0.0005
Gender, n (%)			>.9999
Male	107 (92.2%)	11 (91.7%)	
Female	9 (7.8%)	1 (8.3%)	
Race, n (%) *(n=117)*	*(n=106)*	*(n=11)*	>.9999
White	25 (23.6%)	2 (18.2%)	
Black	75 (70.7%)	9 (81.8%)	
Asian	2 (1.9%)	0 (0.0%)	
Other	4 (3.8%)	0 (0.0%)	

1. The p-values are examining differences in patient characteristics between patients with DVT and those without. For continuous variables, non-parametric Wilcoxon rank-sum tests were used to examine group differences in non-normally distributed variables. Parametric two sample t-tests were used to examine group differences in normally distributed variables. To examine group differences in categorical variables, Fisher's exact tests were used.

Patient characteristics for those with penetrating femoral and popliteal artery injuries with and without DVTs.

Quick Shot #38
January 16, 2020
11:57 am

TO ANGIO OR NOT TO ANGIO: AN ANALYSIS FROM THE AAST PROOVIT STUDY GROUP

Ahmed F. Khouqeer, MD, Sherene Sharath, PhD, MPH, Joseph J. DuBose, MD*, Jeanette Podbielski, RN, CCRP, John B. Holcomb, MD*, John P. Sharpe, MD, MS, Tiffany K. Bee, MD*, Jonny Morrison, MD, Thomas M. Scalea, MD, FACS, FCCM*, David J. Skarupa, MD, FACS*, Richard D. Catalano, MD*, Jennie Kim, MD, Kenji Inaba, MD, Nathaniel Poulin, MD*, John Myers, MD, Michael C. Johnson, MD, John Bini, MD, John Matsuura, MD, Ramyar Gilani, MD
Baylor College of Medicine

Presenter: Ahmed F. Khouqeer, MD

Objectives: The use of a completion angiogram post-traumatic extremity arterial open repair remains an area of debate. Guidelines, however, recommend routine completion angiograms with a paucity of supporting data. We hypothesize that completion angiography is not necessarily associated with improved procedural outcomes and therefore not obligatory.

Methods: Using data from the American Association for the Surgery of Trauma PROspective Vascular Injury Treatment (PROOVIT) registry, we included open repairs of peripheral arterial injuries (axillary, brachial, radial, ulnar, common/superficial/deep femoral, popliteal, anterior tibial, posterior tibial, peroneal arteries). Ligated injuries and immediate amputations were excluded. We divided the cohort into two groups, Completion Angiogram (CA) and No-Completion Angiogram (NCA). The outcomes of interest were: immediate revisions, reoperations, and amputations. Arterial injuries were modeled with multiple factors that could affect the repair and its outcome. Multivariable logistic and linear regressions were used to assess the influence of demographics, diagnostic factors, and pre, intra, and postoperative factors on the use of CA.

Results: Between February 2013 and January 2018, data on 397 patients with 429 peripheral vascular injuries were available. CA was utilized in 92 injuries (21.5%). A greater proportion of CA injuries required immediate revision (22.8% vs 7.4% NCA group, $p< 0.001$). However, there was no difference between groups in need for reoperation (CA 15.2% VS NCA 11.3%, $p=0.30$) or amputation (9.0% CA vs 4.0% NCA, $p=0.06$). Among the repairs without immediate revision, there was also no difference in reoperation (CA 4.2% VS NCA 7.7%, $p=0.30$), or amputation (5.6% CA vs 3.5% NCA, $p=0.40$). The adjusted odds of reoperation increased with immediate revision (OR= 11.79, 95% CI (5.53, 25.1), $p< 0.001$) among the entire cohort. Even when stratified by CA use, reoperation odds were still higher after immediate revision despite CA(OR= 5.6, 95% CI (0.98, 31.5), $p<0.05$). Furthermore, more amputations were observed in injuries with reoperation compared to those without reoperation (21.6% vs 2.7%, $p<0.001$).

Conclusions: CA occurred in approximately 20% of injuries. When CA was used, there was an increase in revisions. CA with revision was associated with higher rates of reoperation suggesting the influence of factors that cannot be ascertained by CA. Contrarily, repair not requiring revision is equivalent whether CA is performed or not. Performance of high quality repair at initial operation with close clinical monitoring is the bedrock of peripheral vascular trauma with CA playing a much more selective role than mandated by guidelines.

Quick Shot #39
January 16, 2020
12:03 pm

VALIDATION OF HEART RATE VARIABILITY AS A MEASUREMENT OF REAL-TIME SURGEON STRESS

Johnathan R. Kent, MD, Allan Fong, MS,
Shimae Fitzgibbons, MD, MEd., Erin Hall, MD, MPH*, Jack Sava, MD
MedStar Washington Hospital Center

Presenter: Johnathan R. Kent, MD

Objectives: Acute stress is a potentially modifiable risk-factor that contributes to surgeon error. Research on stress mitigation has been limited by the lack of a validated objective measure of surgeon stress. While decreased Heart Rate Variability (HRV) is a physiologic measure associated with increased stress, it has not been successfully correlated with subjective measures of surgeon stress. We sought to validate HRV against the Subjective Units of Distress Score (SUDS) in a real-world surgical setting.

Methods: Acute care and trauma surgeons working at an urban level one trauma center wore armbands to measure HRV between October and December of 2018. HRV was analyzed using the standard deviation of N-N intervals (SDNN) and the root mean square of successive differences (RMSSD). Subjective, perceived stress was measured with two approaches. First, participants reported SUDS scores at random intervals. Second, participants identified the moment of peak stress within each four hours of their shift. In the first approach the correlation between SUDS and HRV was evaluated using the McNemar test. In the second approach, the HRV around the period of peak stress was compared to the mean HRV of the 4-hour shift segment within which that peak stress occurred. P values less than 0.05 were considered significant.

Results: Twelve surgeons were monitored for 340 hours, producing 135 SUDS responses and 65 peak stress time points. Decreased SDNN was associated with an elevated SUDS ($P=0.03$). The self-identified time of peak stress within four hours also correlated with decreases in both SDNN and RMSSD ($P=0.02$; $P<0.01$).

Conclusions: In this study, blunting of HRV correlated with high levels of perceived stress in a real-world, trauma care setting. These results lend validity to its use as marker of surgeon stress in trauma and other high-acuity settings. Further work must be done on refining stress metrics and developing mitigation strategies.

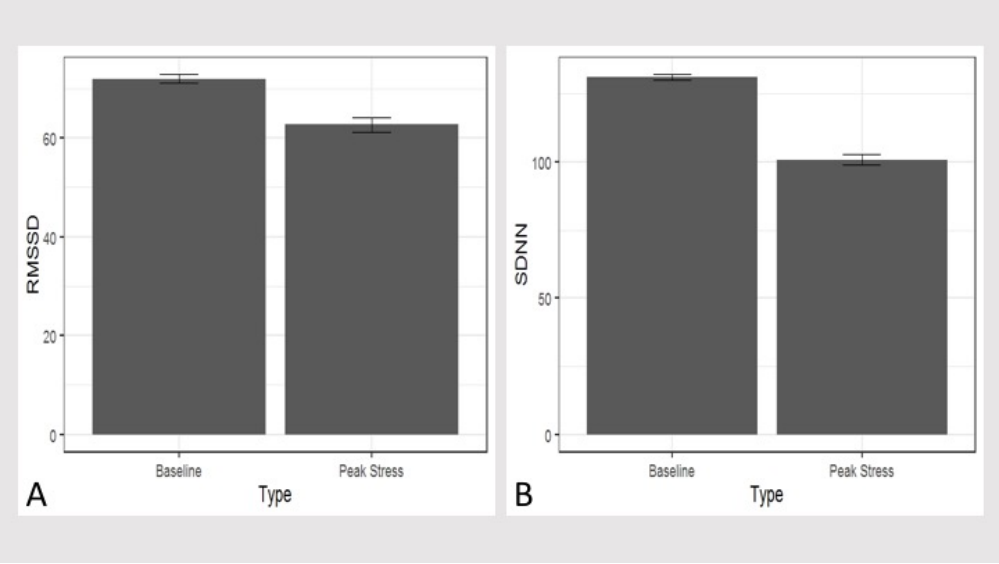


Figure 1. Bar graphs demonstrating the root mean square of successive differences (A) and the standard deviation of N-N intervals (B) during moments of self-identified peak stress compared to the baseline, mean values over the four-hour interval within which the moments of peak stress occurred. Error bars represent standard error. Both significantly lower with $P < 0.05$.

Quick Shot #40
January 16, 2020
12:09 pm

AUTOLOGOUS SKIN CELL SUSPENSION REDUCES LENGTH OF STAY FOR BURN INJURIES

Blake J. Platt, MD, MHS, Jeffrey E. Carter, MD*
Louisiana State University School of Medicine

Presenter: Blake J. Platt, MD, MHS

Objectives: Burn injuries remain a surgical challenge with few recent innovations. Grafting with split-thickness skin grafts (STSGs) has been the standard of care for four decades. Although shown to have mortality benefits, STSGs are associated with significant morbidity in the form of pain and additional open wounds. For years, surgeons have looked for ways to decrease this associated morbidity. To that end, autologous skin cell suspension (ASCS) is a recently FDA-approved point of care regenerative medicine technology that reduces donor skin requirements while neither compromising healing outcomes and patient safety nor requiring a cell culture**.** We reviewed length of stay (LOS) of patients with burn injuries who were treated with ASCS to both STSGs at our institution and to the 2019 American Burn Association National Burn Repository (NBR).

Methods: 36 patients were treated with ASCS in combination with meshed autografts for full-thickness acute burn injuries. Concomitantly, 37 patients were treated with STSGs at our center. Age, percentage burn injury (TBSA), LOS, mortality, and number of surgeries were reviewed. Using the NBR, expected LOS was able to be calculated from TBSA and age data.

Results: Mean age and TBSA was 45.2 years and 6.6% for the STSG group and 46.0 years and 18.6% for the ASCS group. The LOS/TBSA for the STSG was 1.72 versus 1.19 for the ASCS patients, where the NBR predicts a LOS/TBSA of 3.38 and 3.42 for the STSG and ASCS groups, respectively. Patients in the STSG group and ASCS group had statistically similar surgeries and mortalities.

Conclusions: Burn injured patients treated with ASCS had a decreased LOS/TBSA when compared to both the STSGs and NBR predictions. ASCS is a novel technology allowing for point-of-care treatment that may decrease length of stay for burn injured patients and should be considered as an alternative to traditional techniques for burn patients.

Exhibitors

(as of December 2, 2019)

ACell
Acute Innovations
AtriCure, Inc.
Avanos
Beeken Biomedical
Coalition for National Trauma Research (CNTR)
DePuy Synthes
Envision Physician Services
Hackensack Meridian Health
Haemonetics Corporation
Hayes Locums
HCA Healthcare
Journal of Trauma and Acute Care Surgery (JTACS)
KLS Martin Group
Merck+Co., Inc.
NeurOptics
OBP
Pediatric Trauma Society (PTS)
Philips
PolyNovo North America LLC
Portola Pharmaceuticals
Prytime Medical Devices, Inc.
Society of Trauma Nurses (STN)
Starsurgical, Inc.
Synapse Biomedical, Inc.
Synergy Surgicalists
T6 Health Systems
Trauma Centers of America (TCAA)
WellStar Health System
Zimmer Biomet
Z-Medica

633 N. Saint Clair Street, Suite 2400
Chicago, IL 60611-3295
Phone: 312-202-5508 | Fax: 312-202-5064
Email: managementoffice@east.org
Website: www.east.org

east

Eastern Association for the Surgery of Trauma

Advancing Science, Fostering Relationships, and Building Careers