Eastern Association for the Surgery of Trauma (EAST) practice management guidelines and the perpetual quest for excellence

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I am so excited to give this talk here today where I will be discussing the Eastern Association for the Surgery of Trauma (EAST) practice management guidelines and the perpetual quest for excellence. I do have one financial disclosure. I was the paid author of a paper commissioned by the National Academies of Science, Engineering, and Medicine,[1] which I will be citing. There is an online supplement (see Supplemental Digital Content, http://links.lww.com/TA/B686) which has all the slides and photographs mentioned in this address.

Many people in the room today have probably heard the quote that anytime you see a turtle on top of the fence post we know it had some help. Most days I feel like that turtle. I certainly could not have gotten here without help from many people along the way and I want to thank them publicly.

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First up would be a big thank you to the EAST staff — Rachel, Kinga, Alexis, and especially Christine. You have been amazing to work with over the years. Thanks for making it as easy as possible. Thank you for putting up with me. I know it must not be easy, especially when the requests are things like — do you think you could find us an escape room after the strategic retreat meeting dinner in Chicago?

Next up would be the EAST leadership. I have had the honor of being on the board or executive committee under a series of amazing presidents. Thanks for showing me how to lead this organization. I also served alongside numerous board members and committee chairs. Your energy, drive, and excitement for the organization know no bounds.

Yesterday at my last board meeting as president, I gave each one of the board members, and committee and task force chairs, an individualized, personalized pair of EAST surgical socks. I have mine on today. I hope you wear them well and whenever you do, you will be reminded you made a difference.

For me and many others, the EAST meeting has always been about family. We are a perfect example of "work hard, play hard." I have been to about half of all of the EAST meetings, and that number might surprise you. However, even more surprising is the fact that my daughter has been to nearly a third of all EAST meetings that have ever been held. She has grown up alongside kids of other EAST members. I know that the feeling of the meeting has changed somewhat over the years, but I hope we can continue it on and even try to reinvigorate the informal,

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collegial nature. Come up and say hi to me; I am very friendly. Say hi to the board members and past presidents; some of them are friendly too. For everyone out there wearing an EAST Hawaiian shirt or any Hawaiian shirt, I applaud you.

What other academic surgical society do you know of that has their logo on a onesie? EAST cares about family. We have families and we should continue to try to take care of each other. I asked some friends for pictures of their kids in the EAST onesies to show you. Matt Martin could not just send the babies, he had to be in the picture too.

I had quite a unique relationship with the surgical faculty in the division of traumatology and surgical critical care at Penn. I worked with them on and off for over a decade. I rotated on the acute care surgery service (although it was not called that in the 1990s) as a third-year medical student. I rotated in the surgical intensive care unit (SICU) as fourth-year medical student when Mike Nance was a fellow and Mike Rotondo was a junior attending. I was a visiting postgraduate year 2 resident when Don Jenkins was my fellow, doing open trach, G-tube, and J-tube cases. I was a rotating fourth-year resident and worked with John Pryor, Vince Gracias, Raj Gupta, Mark Gestring, and many more. Finally, I spent 2 years as a trauma acute care surgery fellow. Throughout this time, the three constants were some of my most amazing mentors in the early part of my trauma career. I will be forever grateful to Bill Schwab, Don Kauder, and Pat Reilly.

During those 2 years of fellowship, I made some lifelong friends. We spent innumerable hours at our cubicles in our shared office. In addition, outside of work, we got to know each other's spouses and kids. It was a great experience and I would not trade it for anything in the world. Thanks so much Bryan, Oscar, Shahid, Steve, Tracy, Pat, Ruby, Jimmy, Dave, Myung, and even Ben.

Since graduating fellowship at Penn, I have had only one academic job. I sent a cold call letter to Eddie Cornwell at Johns Hopkins during my second year of fellowship. There was no job posted, but Hopkins had everything that I was looking for in an academic trauma program. I have been there ever since. David Efron and I started our faculty positions the same day and have worked together for 15 years. Others, like Adil Haider and Kent Stevens, have been partners for a decade. Some were only around for a few years and have moved to other jobs; I miss them dearly. Some are new additions to the Hopkins family. To all my current partners, thanks for putting up with all the added travel and work that I have dedicated to EAST this year. I really appreciate it.

It is not just my partners that make my job at Hopkins go so smoothly. It is the entire staff in the trauma office, the Halsted surgery nurse practitioners, and nurses throughout the hospital. I have been honored to work with some amazing surgical leaders including Julie Freischlag (this year's frame lecturer), Bob Higgins, and John Cameron. I have also had the opportunity to collaborate with Ellen MacKenzie, the dean of the Johns Hopkins Bloomberg School of Public Health and an outstanding role model researcher in trauma outcomes and an advocate for saving lives millions at a time.

For 10 years, I directed the trauma and acute care surgery fellowship at Johns Hopkins. One of the things I am most proud of in my career is the incredible group of fellows who have come through that program and are doing amazing things across the country and around the globe. Each has chosen their own career path. No two are alike. They are trauma directors, intensive care unit (ICU) directors, residency program directors, authors, funded researchers, military special operations surgeons, and overall just genuinely amazing people.

I only got to play the competing values card game once. Each person gets dealt two random cards and has to walk around the room exchanging cards with other people until they have the two that they feel embodies their top values. I saw the card that stated "mentoring and coaching people" and kept it and stuck with it. The card is taped to the wall in my office and reminds me of my mission every day. Later on, you will hear about my second card.

I would not be where I am today without the slew of mentees at every level. There have been so many residents, students, postdoc researchers, faculty, and many more. It has always been a two-way street. I learn as much from them as they learned from me. I am a better clinician, surgeon, researcher, and human being because of you. Thanks.

EAST IS GUIDELINES, GUIDELINES ARE EAST

Every good scientific talk needs a central hypothesis. Today, I will propose two hypotheses that I hope to prove to you within the next half hour. The first hypothesis is that the growth of EAST as an organization has been driven, at least in part, by the growth of EAST practice management guidelines (PMGs). The second hypothesis is that EAST can implement its mission, show its vision, and illustrate its adherence to our core values via these same EAST guidelines. Basically, I hope you will agree that EAST guidelines *are* EAST.

This is the EAST mission statement: "EAST is a scientific organization providing leadership and development for young surgeons active in the care of the injured patient through interdisciplinary collaboration, scholarship, and fellowship." When you talk to any of the founding members, this mission is critical and has not changed. The EAST vision states, "EAST seeks to improve care of the injured by providing a forum for the exchange of knowledge in the practice of trauma surgery; to promote trauma prevention, research, and improved trauma systems design; to encourage investigation and teaching of the methods of preventing and treating trauma; and to stimulate future generations of surgeons to meet the challenge." At EAST, we have five core strategic goals — leadership, development, scholarship, fellowship, and collaboration.

Before we start talking about EAST guidelines, I want to get us all on the same page to understand the concept of evidence-based medicine. Clinical medicine is a rapidly changing field that requires clinicians of all types to have a vast knowledge to treat patients with a wide array of clinical problems. Our field of acute care surgery might need one of the broadest knowledge bases of all fields of medicine. There are countless journals, books, and online resources that cover the intricacies of clinical medicine. There simply is not time to read every possible source of information about a topic. Evidence-based medicine is meant to make life easier for the clinicians and simultaneously improve care for patients by summarizing what to do in certain situations. The idea is to help us stay up-to-date on best practice

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clinical care and coalesce the evidence and use it at the bedside to treat patients and achieve better outcomes.

EAST was an early leader in evidence-based medicine for trauma. We owe this legacy to Michael Rhodes, the sixth president of EAST. Dr. Rhodes was a true visionary and got our organization started on its first practice management guidelines. He created the first EAST ad hoc practice management guidelines committee and gave his presidential address titled "Practice Management Guidelines for Trauma Care."[2]

I suggest all of you to go back and read this address. Not much has changed about the meat or the substance of those ideas, although the logistics and the specifics certainly have evolved over the last 25 years. Dr. Rhodes reminded us of the major purposes of guidelines: (1) assisting clinical decision-making by patients and practitioners, (2) educating individuals or groups, (3) assessing the quality of care, (4) guiding allocation of resources, and (5) reducing the risks for legal liability. If you look at the figure from his presidential address article,[2] you will notice the overlapping Venn diagram showing the protocol for standardized care at the center linking to all the different parts around it.

I got a lot of advice from past presidents of EAST, most of whom said to read all the prior presidential addresses. As I did, I found at least 10 presidents have mentioned or talked about guidelines as a part of their address since Mike Rhodes gave his inspiring talk. Some mentioned PMGs a little, whereas a few focused their entire talks on them. They gave us quotes like this from John Morris who said, "Dr. Rhodes and Dr. Pasquale changed the structure of the organization. They changed the thinking of surgeons, and they changed the way we are all going to practice medicine in the next decade."[3]

The next president to focus entirely on guidelines was Timothy Fabian in his 1999 presidential address titled "Evidence-Based Medicine in Trauma Care — Whither Thou Goest?"[4] He complained about all the journals he had to keep up with. "There are over 30 English language surgical journals that contain articles that may have some impact on how we manage trauma." That number has exploded, and ironically, Dr. Fabian is the editor of one of these new journals, *Trauma Surgery & Acute Care Open*. He also mentioned the paucity of evidence-based medicine articles with just more than 500 published. Today that number stands at over 180,000. He had great ideas about how to use PMGs, starting with standardizing the PMG creation process, followed by implementation, and eventually the responsibility to perform high-quality research to fill in the knowledge gaps.

Michael Pasquale's 2006 address spoke about "Outcomes for Trauma: Is There an End (Result) in Sight?"[5] He started with "this talk is the third in a series…., that hopefully will continue into the future." I guess I am here to prove him right. He focused on PMGs as a pathway to quality improvement. I really liked his talk, mostly because it supports my own biases, with my own personal mantra and goal to reduce system errors — my second competing values card. He talked about the newly formed National Surgical Quality Improvement and Trauma Quality Improvement Program (TQIP) programs at the American College of Surgeons. Dr. Pasquale was an early adopter of the use of a caterpillar graph to compare outcomes, which we now take for granted and routinely see used to benchmark quality of care.

TABLE 1. Institute of Medicine Standards for Trustworthiness of Guidelines

- Transparent process
- Conflicts of interest
- Guideline development group composition
- Systematic reviews
- Evidence quality and recommendation strength
- Articulating recommendations
- External review
- Updating

The EAST guidelines committee has had impressive leadership from the beginning. The first person to chair this committee was Dr. Rhodes himself, followed by Michael Pasquale, Fred Luchette, Stan Kurek, and Bill Bromberg. The EAST goals of development and leadership clearly shined in the work produced by this committee. I took over as chair from Andy Kerwin, and it was one of those classic handoffs with a line in passing something like "Oh, by the way we are switching to GRADE." I had no idea what he was talking about and just assumed I would figure it out. How bad could it be? The year before I took over as the guidelines committee chair, the EAST board had approved a plan to transition from the original EAST guideline methodology to the new Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. I signed out the committee chair role to Bryce Robinson, and it is currently chaired by John Como with Vice Chair Nicole Fox.

With many groups writing guidelines, it is often hard for the casual user to tell which ones are useful tools and which are junk. How do we know that a guideline is trustworthy? The United States Congress realized that this was a critically important question and wanted to be sure that there were standards for rigorously written and trustworthy guidelines.

They tasked the Institute of Medicine to create a tool kit and ensure that evidence-based medicine is done in a robust and safe manner. The book titled "Clinical Practice Guidelines We Can Trust" was published nearly a decade ago and contains recommended standards for guideline development.[6]

In a *JAMA* article announcing the new criterion standard practices for creating guidelines and systematic reviews, we are reminded of the many benefits guidelines offer.[7] They reduce inappropriate practice variation, speed translation of research into practice, improve care, safety, and quality, reduce disparities, and cut costs. It sounds like a win-win for everybody.

The eight specific standards are listed in Table 1.[8] I will not go over each one line by line, but there are a few that I would like to highlight. First, a transparent process is critical. The reader of the guideline article should be able to understand the exact steps that were taken to review the literature, coalesce the data, and come up with a recommendation. Second, the team is crucial. We need the right leaders and coauthors from all key stakeholder groups to ensure that there is a balanced approach and conflicts of interest do not play a part in the recommendations. Then, the actual methodologic approach needs consistency to ensure that all the right data are found and looked at appropriately, and the recommendations are clear. An external

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review, ideally in a blinded peer-reviewed fashion, helps ensure neutrality.

Interestingly enough, there was an international collaborative group developing strict criteria and methods to do almost exactly what the Institute of Medicine had suggested. The GRADE working group had a process for grading of recommendations, assessment, development, and evaluation (https://www.gradeworkinggroup.org/). GRADE is now the gold standard for guideline development and is currently endorsed by well more than 100 international organizations, including EAST.

I took over the EAST guidelines committee in January 2012. I quickly learned that GRADE was very complex and, for us to do this right, we needed a cadre of smart trauma surgeons to be trained in this new approach to evidence-based medicine. The EAST board funded me and John Como to take a 2½ day course about evidence-based medicine with a specific GRADE focus at the New York Academy of Medicine in the fall of 2012. It was there that our nearly 10-year collaboration with expert methodologists began. Three key players have been collaborating with us on EAST guidelines ever since. Thank you to Philipp Dahm, Yngve Falck-Ytter, and Shahnaz Sultan for your ongoing investment in EAST. Since then, EAST has funded nearly 50 members to take multiday, in-person educational sessions led by world experts in GRADE and the field of evidence based-medicine to ensure that we have the knowledge and skills to create trustworthy guidelines. We also had a course this morning at the meeting where more than a hundred attendees learned the nuances about PICOs questions, evidence tables, and all the rest.

In one of his most important roles on the committee, Andrew Kerwin was the lead author on the new summary approach to GRADE from EAST.[9] This article was published as part of a supplement in the *Journal of Trauma and Acute Care Surgery* in the fall 2012. It accompanied a dozen EAST guidelines including the final batch written based on the original primer. Since then, all EAST guidelines have used the GRADE methodology. In our forward to the supplement, Andy and I reemphasized the impact Dr. Rhodes had on guideline development and EAST as an organization,[10] yet another source of data to support my hypotheses.

To help support my hypothesis that guidelines have grown along with EAST, I will provide the more data. Originally, all of our practice management guidelines were for clinical trauma patient care. That is what EAST did at the time. We still create trauma guidelines; they are at our core. These include management of hemopneumothorax,[11] penetrating rectal injury,[12] blunt aortic injury,[13] and pancreatic injury,[14] just to name a few. However, EAST has expanded and has changed along with the times to embrace all aspects of acute care surgery. Accordingly, we now have clinical guidelines in emergency general surgery and surgical critical care. We also expanded to align with our mission of injury prevention and have numerous guidelines in this arena.

We have a wide array of guidelines for common emergency general surgical diseases such as appendicitis,[15] *Clostridium difficile*,[16] small bowel obstruction,[17] pancreatitis,[18] and many more. EAST also provides guidelines for surgical critical care. Some have a trauma focus, like β-blockers after traumatic brain injury,[19] whereas others are more broad based for our practice in the surgical intensive care unit, such as monitoring modalities, assessment of volume status, and endpoints of resuscitation.[20]

We publish guidelines and evidence-based reviews on important topics in the area of injury prevention. This area clearly directly aligns with the original EAST charter and our mission to promote injury prevention. These cover a wide array of topics related to distracted driving,[21] fall prevention in the elderly,[22] and the benefits of helmet use.[23]

Ever since Bill Schwab gave his EAST presidential address in 1992 titled "Violence: America's Uncivil War," EAST has taken a stance against firearm injury.[24] Not surprisingly, we have used data, rather than emotion only, to make recommendations. We have three important evidence-based reviews on topics related to gun safety and firearm injury prevention.[25–27]

We were ahead of the curve, so many EAST members have gotten on board with the #ThisIsOurLane movement on social media, led by my Hopkins partner and past chair of the EAST Injury Control and Violence Prevention committee, Joseph Sakran. When the Sandy Hook elementary school shooting took place in 2012, I was chairing the guidelines committee and Britt Christmas, our incoming president, was chairing the injury control and violence prevention committee. The EAST leadership was considering publishing a statement on behalf of the organization. However, rather than chiming in without data, we made a conscious decision to not just jump on board like many other organizations did at that time.

When EAST published our firearm injury prevention statement, I believe that we were the only one with a long list of citations.[28,29] We used over 75 references and clearly state that "EAST supports evidence-based strategies to reduce firearm injuries" and follow with 10 specific recommendations. Our organization's ethos and ingrained desire to use evidence comes through clearly in this statement. EAST is all about the data.

In February 2019, I represented EAST and joined leaders from nearly 50 other organizations at the Medical Summit on Firearm Injury Prevention in Chicago. In case you cannot see me, I am the one in the middle wearing an official EAST Hawaiian shirt. The article based on the meeting reemphasizes the public health approach to reduce death and disability in the United States from firearms.[30] Yet again, EAST brought data to the table with numerous references to our guidelines and our firearm injury prevention statement.

EAST is all about putting our money where our mouth is. We helped fund a public service announcement about safe storage of firearms (based in part on an EAST guideline) in collaboration with End Family Fire, the Brady Foundation, Giffords Courage to Fight Gun Violence, the American College of Surgeons Committee on Trauma (ACS-COT), Power4STL, and This Is Our Lane. If you have not seen this video produced by EAST members Laurie Punch and Joe Sakran, I urge you to find it on social media and take a look.

Who else is looking at EAST guidelines? I would propose to you that EAST is best known throughout the world for our practice management guidelines. You might wonder who appreciates EAST and reads our guidelines. Some of the most important national organizations look to us for guidance on important questions related to trauma.

The National Quality Forum is the most trusted organization creating and endorsing measures of health. Their motto is

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"driving measurable health improvements together." In their recent "Population-Based Trauma Outcomes" report, EAST was heavily featured.[31] The report pulled measure concepts from different areas, and far and away the leading two were the American College of Surgeons TQIP program and our own EAST guidelines.

The next important organization that has looked to EAST for guidance is the National Academies of Science, Engineering and Medicine. In 2016, they published a book titled *A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury.*[32] The group was led by Don Berwick and has many familiar faces including EAST members such as Adil Haider, Ellen McKenzie, John Holcomb, Tom Scalea, and Bill Schwab. This book is dedicated to Dr. Norman McSwain, a founding EAST member, who was on the working committee, but died before the project was completed.

The book talks about guidelines in general in numerous spots and reminds us that best practices and innovation will only improve trauma care and patient outcomes if they are disseminated and applied into routine practice. I was honored to be asked to write an article to support this report. In collaboration with Clay Mann and Russ Kotwal, we wrote about the "Importance of Data Driven Decision Making."[1] As you might expect, EAST guidelines were prominently highlighted throughout our 75-page article.

Although EAST has been known as the *de facto* leader in guideline development for trauma for decades, we are not the only game in town. The military has a series of clinical practice guidelines that are also freely available for use and open to the public. Some are applicable to the civilian setting such as airway management and thoracic injury. Others are clearly not, including those about dismounted complex blast injury and unexploded ordinance management. Other groups also offer education with different approaches to best practice in trauma care. The ACS-COT publishes TQIP Best Practice Guidelines, and the Western Trauma Association publishes clinical algorithms. Although their methodology does not include a rigorous systematic review and meta-analysis, I support their use as these offerings give complimentary information to the bedside clinician.

I want to provide some data about the vast number of guidelines that EAST has written and their overall impact. To do this, just like every good systematic review, I asked my local librarian (or informationist) from the Welch Library at Johns Hopkins to help me. Thanks to Stella Seal for collecting the following statistics.

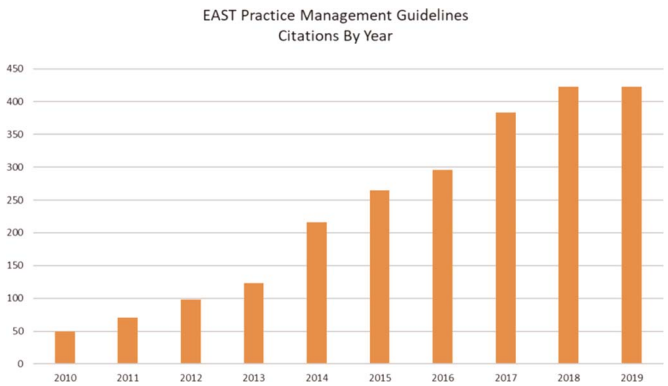

Figure 1. The EAST Practice Management Guidelines Citations by Year (2010–2019).

I was actually shocked to learn some of the numbers I am going to tell you right now. So many EAST members have been involved in guideline creation over the past two decades. More than 800 people have been cited as guideline writers including nearly 400 unique authors. More than 150 people have written 2 or more guidelines, and at least 6 people have coauthored 11 or more guidelines. When I look at these numbers I estimate that about 15% of the EAST organization's members have helped write a PMG. Perhaps I can get a show of hands from those in the audience who have coauthored a PMG so we can publicly thank you.

The numbers show that EAST has published more than 70 guidelines that have received nearly 4000 total citations. This gives a mean of more than 50 citations per guideline with a median of 26. Eleven guidelines have been cited more than 100 times. When you look at the guidelines as a whole, they have an H index of 34. Dr. Moore, editor of the *Journal of Trauma and Acute Care Surgery*, should be very happy with EAST and our PMGs.

The numbers of citations are steadily growing year by year and have been more than 400 for the past 2 years (Fig. 1). In case you were wondering which are the most cited, here they are. Leading the pack is our venous thromboembolism guideline led by Fred Rogers,[33] and in second place is our red blood cell transfusion in adult trauma and critical care PMG led by Lena Napolitano in collaboration with the Society for Critical Care Medicine.[34]

All this publishing gives the opportunity to touch on two of EAST's core strategic goals — development and scholarship. As we all know, EAST is heavily involved in mentoring. We have a standing committee on mentoring currently chaired by Jamie Coleman. We have officially paired more than 100 EAST members with a mentor to help them with many aspects of their career.[35] Our guidelines give an excellent opportunity to mentor in a specific area of academics, evidence-based medicine, systematic reviews, and publishing. I have a list of nine residents or fellows that I have personally worked with at Johns Hopkins, and I know they have coauthored at least one EAST guideline (Kyle VanArendonk, Jose Salazar, Lisa Kodadek, Amy Rushing, Catherine Velopulos, Marcie Feinman, Sam Galvagno, Jana Hambley, Linda Dultz). This is just my personal example, and I am sure that there are many more out there from other institutions. As I wrote in one of my earlier president's messages, for those of you who are residents, fellows, or junior faculty, this is a great way to get involved with EAST, learn a new skill, and publish a high-impact paper.

It is important to understand the conventional news media and social media impact of the EAST guidelines. The easiest way to do this is with the Altmetric score. This score summarizes the online attention and activity for a specific research output. Three EAST guidelines have reported an Altmetric score more than 100. These correspond to the numbers 10, 16, and 21 articles ever scored by Altmetric in the *Journal of Trauma and Acute Care Surgery.* The guidelines I just mentioned cover emergency department thoracotomy[36] by Mark Seamon, cervical spine clearance in the obtunded adult blunt trauma patient[37] by Mayur Patel, and damage control resuscitation in patients with severe traumatic hemorrhage[38] by Jeremy Cannon.

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EAST is clearly the recognized leader in guideline development, yet again supporting my hypotheses. In fact, multiple other organizations have looked to EAST to help them create guidelines. These have included the Society for Critical Care Medicine, the American Association for the Surgery of Trauma, the Pediatric Trauma Society, and the Trauma Anesthesia Society. We have ongoing PMG collaborations with the Chest Wall Injury Society, the Society of Trauma Nurses, and the Orthopedic Trauma Association. Hopefully by now you are starting to believe me that EAST is known for guidelines and everybody looks to us for leadership in the field of evidence-based medicine. These examples provide more data to show that PMGs support EAST's core strategic goals — collaboration, scholarship, and fellowship.

The EAST guideline writers have been invited to speak on the topic around the globe. I have spoken at meetings of the American Burn Association, Pediatric Trauma Society, World Trauma Congress, and the Brazilian Institute for Patient Safety. Other EAST members including John Como, Bryce Robinson, Nicole Fox, Mayur Patel, and Rachael Callcut have given invited talks at meetings of the Society of Critical Care Medicine, Trauma Anesthesia Society, Society of Trauma Nurses, and likely many more.

However, there are still gaps and not everybody knows about EAST and our guidelines. An article in *Annals of Surgery* last year was titled "Guideline Assessment Project: Filling the GAP in Surgical Guidelines."[39] Its goal was to summarize all surgical guidelines and evaluate their quality. The authors selected organizations that they knew published guidelines and found that 10 groups had published 67 guidelines. Unfortunately, EAST was not on the list. We wrote a letter to the editor in reply on behalf of EAST[40] and asked why they did not systematically search for all surgical guidelines rather than use such a nonsystematic approach. EAST published 31 guidelines over the same period. Had our EAST PMGs been included, we would have blown the others out of the water and contributed more than any other single organization in the analysis.

Hopefully by now I have proven my hypothesis that the growth of EAST has been driven by the growth of our EAST Practice Management Guidelines. I have provided countless examples of how these PMGs can be used to fulfill EAST's cores strategic goals — leadership, development, scholarship, fellowship, and collaboration. By now, you must be convinced that EAST guidelines *are* EAST.

Now, I have a challenge and a call to action to everybody sitting in the audience (or reading this address) today. We need your help with EAST guideline dissemination. I challenge you to help us promote and promulgate evidence-based medicine in trauma and acute care surgery locally at your institution, as well as on a county, state, regional, national, and global scale. The good thing is that I am going to give you some step-by-step, easy ways to do this and cite a couple concrete examples of how it can be done.

First, you need to know where to get the guidelines. All EAST guidelines are freely available on our website at www.east.org. You can go on your desktop computer and download a full PDF and pour over the data and information, or you can go on your mobile device, an Iphone, iPad, or tablet and see the recommendations quickly at the bedside. Most of our guidelines are published in the *Journal Trauma and Acute Care Surgery*, and the publisher has made these freely available for anybody worldwide, even to people without a subscription. They can be accessed at https://journals.lww.com/jtrauma/Pages/collectiondetails.aspx?TopicalCollectionId=3.

I ask you to use these informally in your institution. Put them into your presentations. Use them at teaching conferences, journal clubs, morbidity and mortality, and grand rounds. Cite them during your bedside teaching or daily rounds. Pull them up in the emergency department or the ICU. Reference them during morning report. Make sure your partners, colleagues, residents, fellows, students, nurses, physician assistants, and nurse practitioners all know about them. Remember, they can be used by everyone, not just trauma surgeons. Share them with colleagues from anesthesia, orthopedic surgery, and emergency medicine.

I am not asking you to do something I do not do myself. I walk the walk. This photo is an example of a Johns Hopkins surgery resident showing one of the EAST guidelines during a teaching conference in combination with emergency medicine. I do not remember exactly what Bobby Beaulieu said, but it was probably something like "since Dr. Haut is here, I guess I have to show an EAST guideline." Also, as I tweeted that day, "If you are going to get mocked in front a giant audience, at least let it be for promoting #EvidenceBasedMedicine @EAST_TRAUMA #guidelines."[41]

You can also use guidelines more formally at your institution. You do not have to reinvent the wheel. If you want to start a new protocol or pathway, my suggestion is to find the best evidence out there, whether it is an EAST guideline or some other evidence-based medicine resource. You can then adopt it "as is" and you are ready to go, or you can modify it to fit your specific situation.

Now I challenge you all to get out there and make a change that will impact patients. This might be in your county emergency medical services (EMS) system, or it might be in the state or regional level. Maybe it will influence a national policy. You will need to bring data, and for that data, I strongly recommend a reputable guideline that can ago a very long way.

As described in the Translating Evidence Into Practice model, evidence is always the first step for knowledge translation.[42] You need to know what is the best practice or optimal care before you implement anything onto a larger scale. If you want to more learn more about implementation science, read two recent articles with a surgical[43] or trauma-specific perspective.[44] Vanessa Ho (my EAST mentee), Rochelle Dicker, and I walk you through some step-by-step examples of how to do this in the article published in *Trauma Surgery & Acute Care Open*. This article is part of a series recently published summarizing a conference sponsored by the Coalition for National Trauma Research (CNTR). The CNTR is a collaborative organization made up by members from EAST, Association for the Surgery of Trauma, Western Trauma Association, and the ACS-COT. The CNTR Scientific Advisory Council is a collaborative group aiming to perform high-quality, large-scale, multi-institutional trauma research.

I will give you one example of how we used data to change clinical practice in Maryland. We know that spinal mobilization is frequently used in trauma patients in the prehospital setting. The concept is to immobilize the spine in a patient with

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incomplete spinal cord injury to prevent worsening a neurologic injury. However, we also know that there is potential harm from time delay and the facts that the collar can cover penetrating wounds and it makes endotracheal intubation more difficult. During my address, I showed a photo of a patient I operated on a few years ago for a gunshot wound to the carotid artery. A cervical collar was not going to help, and it would have delayed transport, hemorrhage control, and definitive surgical care. We wrote an article almost 10 years ago and reconfirmed that spine immobilization in penetrating trauma may be more harm than good.[45] This article got some lay public press and it felt like all the EMTs and Paramedics in Baltimore would say to me "Hey, you are the stop using the cervical collar guy. Right?" Our data matched the recommendations from the Prehospital Trauma Life Support executive committee.[46] When Catherine Velopulos was a trauma fellow at Johns Hopkins, we brought these data to the Maryland Institute for Emergency Medical Services Systems, our state EMS agency, to support a protocol change. The protocol now reads "patients with isolated penetrating trauma should not have spinal immobilization performed." More recently, EAST published a guideline on the topic with Dr. Velopulos as the lead author.[47] I suggest you could take the Prehospital Trauma Life Support recommendation and EAST guideline to your local EMS agency to change this practice as well.

I am calling on you to push our elected officials to increase federal funding for trauma research. Trauma remains a neglected disease with such a minimal amount of funding compared with the burden of disease. Past EAST president Kimberly Davis published these data in *JAMA Surgery* showing what a paltry amount is spent by the federal government.[48] We must do better. These are some pictures of me, other EAST members and trauma surgeons spending time in Washington DC to advocate for what is right for patients. Please help us. Advocacy works. One of the explicit asks in the EAST Firearm Injury Prevention Statement was for "federal funding of firearm-related research to inform solutions."[28,29] This is a picture of me with Representative Rosa DeLauro from Connecticut who chairs the House appropriations subcommittee on Labor, Health and Human Services, and Education. This picture was taken just a few weeks before Congress approved US $25 million in federal funding for gun violence research — half each for the Centers for Disease Control and Prevention and National Institutes of Health.

If you hold up your end of the bargain and help with the promotion, propagation, and implementation of EAST PMGs, I promise that EAST will do its fair share. We will continue to write high-quality PMGs, as well as promulgate, collaborate, and educate about PMGs. We have recently reorganized the EAST guidelines committee structure. In addition to the content task forces, we now have five operational task forces that will help us standardize our workflow for guideline creation, solidify our brand recognition, increase our PMG dissemination, and continue to be the leaders in evidence-based medicine that Michael Rhodes dared us to be.

Be on the lookout on your social media feeds for more content related to EAST guidelines. You will see more EAST minutes, which are short video snippets summarizing the guidelines. I hope we have more EAST online, Twitter-based journal clubs to discuss the topics. Finally, our goal is for each guideline to have a new visual abstract to summarize the entirety of all that work in a single graphic image. I challenge EAST to double down on the time, energy, and effort we put into our practice management guidelines. We should play to our strengths. As Tim Pawlik says, "Don't be a spork." If you want to be a spoon, be a spoon. If you want to be a fork, be a fork. No matter what you are doing, focus and do it well.

FAMILY

Now, some more thank yous to my friends and family. It makes me sound old to say I have friends who I have known for 40 years, but the truth stands. We do not see each other as much as we did in high school, but these are the kind of lasting friendships people talk about. Thanks, Marc Neff, for traveling all the way to Florida to be here today representing the poker guys.

Family means a lot. I am the oldest of three siblings. My sister Wendy, brother Jonathan, and I were so cute when we were little, I just do not know what happened. We got along great as kids, at least in these four or five pictures. Jon always used to be the annoying little brother, but things have changed so much, and we have now adopted him into my group of poker friends we just heard about. Jon and his fiancée Cara are in the audience.

My mom could not make the trip from Philadelphia today to be here in person. I know she is going to watch this later on video, so I want to say "Hi, Mom." My mom was a dedicated Headstart teacher in the inner city of West Philadelphia. She taught me to do the right thing for people no matter who they are, where they live, or how much money they have. My mom is an artist and had her work displayed in the Philadelphia Museum of Art. She would be proud and excited to know that I showed a couple of my favorite pieces that hang in my dining room here to the audience.

I have been told I look a little bit like my dad. What do you all think? My dad was a physician and worked incredibly hard when I was a kid, and I thought I would never want to do that when I grew up. However, when push came to shove, I realized that he loved what he did and I wanted to be just like him. After medical school, I matched into surgical residency at Pennsylvania Hospital where my father worked as a medical oncologist for 30 years. Over the next 6 years, my dad and I shared patients, went to the same conferences, and ate dinner when I was on call. I learned more from him about being a doctor than anybody else. My dad died about 6 years ago. If there was one person in the world I wish could be here today, it would be him. He would really appreciate what it means. He would get a kick out of it even more so than knowing his obituary was published in a peer-reviewed journal and is now PubMed indexed.[49]

I hate to wear a tie. If it were up to me, I would never wear one. However, if I have to, I want to make count. When my dad died, I went to his closet and took a whole bunch of his ties. When I go give a talk and wear one of his ties it is like he gets to come along for the ride. Invariably, I get asked about that interesting tie and I have probably told that story at least a hundred times. His ties have been across the country and to three continents so far, with two more planned for later this year.

To my amazing daughter, Arenal. How is it possible you have grown up so quickly? It seems like just yesterday you were a baby chewing on your plastic stethoscope or a 3-year-old reading your dad's trauma surgery textbook. Your intelligence,

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compassion, perseverance, and humor shine through. Keep working hard, but also keep up that smile. Good luck next year at Brown.

To my son, Fletcher, my mini me. You are wild. You are independent. You are headstrong. You are determined. You are strong-willed. I am counting on you to change the world when you grow up. Until then, I love just spending time with you, whether it is playing ping-pong, getting matching Mohawks, taking a ride in the car or on our bikes, or when you help me teach stop the bleed. Thanks for putting up with my dad jokes and really appreciating how fun and miserable they can be all at the same time.

To my wife, Jayne. I cannot believe it was over 30 years ago that we met on our first day of college at Brown University. No pressure, Arenal. We have been through the good times and the bad. We all know you do not get much help from me at home. You have done an amazing job raising our kids on a day-to-day basis. Thank you. I could not have made it here without your ongoing support. For all of us in medicine, we get pulled away from our loved ones, whether it be for clinical work or academic travel. It is extremely hard on our families. But those same families are the ones that recharge us, revive us, and make our lives worth living. Jayne, you are an amazing person, and I would not be here today without you. I love you.

CLOSING

Now in closing, a few last remarks. I have appreciated the EAST organization throughout my entire medical career. I read EAST guidelines as a resident and fellow before I even attended my first EAST meeting. For the past decade, I have been 100% committed and have poured my heart and soul into this organization. I want everyone to find their passion, such that when you tweet, it is all in capital letters like Natalie Wall who stated "OH MY GOD I LOVE TRAUMA SURGERY." [50] I want you to stay committed to whatever you decide to pursue.

As I neared the end of my presidency, I thought to myself what would be my lasting EAST legacy? How will I be remembered as the EAST president? I posted this picture of my EAST tattoo online last week as a sign of my dedication and commitment to the organization.[50] However, I also want this photo to be a reminder. Do not believe everything you see on the internet. I am hopeful today's talk has inspired you to embrace the world of evidence-based medicine. You need to study the data and go to reliable sources to ensure you have the best evidence upon which to make a decision.

No, I did not really get a permanent tattoo, although it is "real," so I never technically lied. It is all "fake news." Some people spotted it right away, but others were not really sure. In fact, there were at least 2 phone calls from past EAST presidents to the central office checking to see if this was for real. I have whole stack of these real but temporary tattoos. Please find me to get one and put it on to match me and show your dedication to EAST.

I am now ready to pass the presidential torch on to my colleague and friend Britt Christmas. The EAST is in great hands and I am excited to see where the organization moves in the future. Thank you.

DISCLOSURE

E.R.H. is primary investigator of contracts from the Patient-Centered Outcomes Research Institute entitled "Preventing Venous Thromboembolism: Empowering Patients and Enabling Patient-Centered Care via Health Information Technology" (CE-12-11-4489) and "Preventing Venous Thromboembolism (VTE): Engaging Patients to Reduce Preventable Harm from Missed/Refused Doses of VTE Prophylaxis" (DI-1603-34596). He is primary investigator of a grant from the Agency for Healthcare Research and Quality (AHRQ) (1R01HS024547) entitled "Individualized Performance Feedback on Venous Thromboembolism Prevention Practice" and is a coinvestigator on a grant from the National Institutes of Health/National Heart, Lung, and Blood Institute (NHLBI) (R21HL129028) entitled "Analysis of the Impact of Missed Doses of Venous Thromboembolism Prophylaxis." He is supported by a contract from the Patient-Centered Outcomes Research Institute, "A Randomized Pragmatic Trial Comparing the Complications and Safety of Blood Clot Prevention Medicines Used in Orthopedic Trauma Patients" (PCS-1511-32745). He receives research grant support from the Department of Defense (DOD)/Army Medical Research Acquisition Activity and has received grant support from Henry M. Jackson Foundation.
E.R.H. receives royalties from Lippincott, Williams, Wilkins for a book "Avoiding Common ICU Errors." He was the paid author of an article commissioned by the National Academies of Medicine titled "Military Trauma Care's Learning Health System: The Importance of Data Driven Decision Making," which was used to support the report titled "A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury." He was a member of the National Quality Forum Trauma Outcomes Committee. He received consulting fees from Vizient as a subject matter expert for their VTE Prevention Acceleration Network.
The author declares no conflicts of interest.

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