"Once-in-a-Generation" CPT Documentation Guideline Changes
Looking at 2023 documentation guideline changes for ED E/M Codes 99281-99285

by DAVID A. MCKENZIE, CAE, AND MICHAEL A. GRANOFSKY, MD, FACEP, CPC

On July 1, 2022, the American Medical Association (AMA) released a preview of the 2023 CPT Documentation Guidelines for Evaluation and Management (E/M) services. These changes reflect a once-in-a-generation restructuring of the guidelines for choosing a level of emergency department (ED) E/M visit impacting roughly 85 percent of the relative value units (RVUs) for typical members. Since 1992, a visit level was based on a combination of history, physical exam, and medical decision-making elements. Beginning in 2023, the emergency department E/M services will be based only on medical decision making.

The American College of Emergency Physicians (ACEP) represents the specialty in the AMA current procedural technology (CPT) and AMA/Specialty Society RVS Update Committee (RUC) processes. In fact,
The COVID-19 pandemic brought with it the availability of a range of SARS-CoV-2 testing options. When implementing a frontline testing strategy, we know that speed, low cost, ease-of-use, and accuracy in both symptomatic and asymptomatic populations are of the utmost importance.

But if you think all rapid antigen assays are the same, think again.

51

51 SARS-CoV-2 Antigen assays available under EUA

44

44 rapid antigen tests for POC

Only 1 microfluidic immunofluorescence assay

LumiraDx SARS-CoV-2 Ag is the only microfluidic immunofluorescence assay available under EUA, and the only antigen test authorized for use on symptomatic patients up to 12 days following symptom onset.

What sets our test apart from traditional lateral flow Ag tests is our next-generation microfluidic technology. In contrast to the passive action of lateral flow methods, our microfluidic technology allows us to control every aspect of the test process including mixing, timing, temperature, incubation, magnetic capture and wash, and signal detection. This next-generation technology is how we attain near PCR sensitivity. The LumiraDx SARS-CoV-2 Ag test demonstrated 97.6% PPA to RT-PCR, with results in 12 minutes on an easy-to-use platform.

Contact us to learn more about the microfluidics difference.
NEWS FROM THE COLLEGE

It’s Almost Time for Unconventional

Couldn’t make it to ACEP22 in San Francisco? There is still time to register for ACEP22 Unconventional, a virtual version of the conference that allows you to learn and connect from the comfort of your home. If you attended ACEP’s first Unconventional conference back in 2020, this format will look familiar. Held Nov. 2–4, this online conference will feature recordings of ACEP22 courses followed by live Q&A sessions with the faculty. Courses will be viewable for 30 days after the meet up with Research Forum abstracts available on demand. Courses will run all day and social events will be held during the evenings. Learn more and register by visiting our website at acep.org/sa/experience/acep22-unconventional.

Congratulations to the Winners of ACEP’s Section Awards

ACEP is pleased to announce the winners of its annual section awards:

• Service to Section: International Emergency Medicine Section
• Service to College: Palliative Medicine Section; Emergency Ultrasound Section
• Promoting Section Membership: Democratic Group Practice Section
• Outstanding Newsletter: Tactical Emergency Medicine Section; Young Physicians Section; Emergency Ultrasound Section

ACEP has more than 30 sections representing different career phases and niche interests within emergency medicine. Learn more at acep.org/sections.

ACEP Submits Comprehensive Response to Proposed Physician Fee Schedule

In early September, ACEP submitted a comprehensive response to the Centers for Medicare & Medicaid Services’ (CMS) Calendar Year (CY) 2023 Physician Fee Schedule (PFS) and Quality Payment Program (QPP) proposed regulation. The PFS and QPP regulation is the major annual regulation that impacts Medicare payments for physicians and other health care practitioners for the next calendar year. The rates included in the PFS often serve as the basis for which many private payors revise their reimbursement levels. The reg also includes updates to the Quality Payment Program (QPP)—the quality performance program established by the Medicare Access and CHIP Reauthorization Act (MACRA). ACEP’s 32-page response addresses Medicare payment cuts, documentation requirements, critical care, observation services, and more. CMS must review all public comments, including ACEP’s response, and issue a final regulation implementing policies for CY 2023 by Nov. 1, 2022. Take a deeper dive into the issue by reading ACEP’s weekly regulatory blog, Regs & Eggs, at acep.org/regsandeggs.

You’re Invited to a Luxury Wellness Experience in Arizona

If making space to relax and recharge sounds good to you, consider the ACEP Physician Wellness Retreat. ACEP is partnering with Miraval, one of the country’s premier wellness resorts, to provide our members a special opportunity to get away from it all. Held Nov. 4–7 in Tucson, Arizona, this retreat features all the luxuries of the resort combined with a custom curriculum to help combat the unique stressors of the physician life. Learn more at acep.org/wellnessretreat.

Enhance Your Leadership at the ED Directors Academy

ACEP’s Emergency Department Directors Academy (EDDA) is designed to give attendees tried-and-true solutions to ED issues from a group of experienced practitioners and management experts. During EDDA, you will learn to enhance your ED leadership through a series of lectures, breakout sessions, and small-group case studies. Start your journey with EDDA Phase I, coming Nov. 7–11 in Dallas, Texas. Learn more at acep.org/EDDA.

ACEP Debuts New Field Guide for Opioid Use Disorder

In late September, ACEP published a new guide focused on managing opioid use disorder in the emergency department. Like previous guides focused on COVID-19 and Monkeypox, the Opioid Guide is a comprehensive resource. It covers a broad range of topics, from pharmacology to opioid use disorders. Find the Opioid Guide at acep.org/opoid-field-guide.
CEP Fellow Amy Ondeyka has always been a dog lover. Five years ago, she decided to adopt a corgi mix from out of state, sight unseen. But when her new dog arrived, she quickly realized he was not what she expected. Sawyer was actually an Australian cattle dog overflowing with energy and smarts who had a penchant for opening cabinets and hiding important things from her. “He stole my wedding band for 24 hours! We thought he ate it, but then he brought it out and dropped it at my feet when he realized we were looking for it,” Dr. Ondeyka said. She realized Sawyer needed some serious mental and physical stimulation, so she bought a simple dog agility course to try out in the backyard. Sawyer was a natural, and they both fell in love with the sport. Dr. Ondeyka loved how dog agility races were an exciting burst of brain and body working together. “You literally have no idea what your dog is going to do when you get into the competition ring,” Dr. Ondeyka explained. “It’s the great unknown, which I guess all of us kind of love as emergency physicians because none of our shifts will ever be predictable.”

They began competing locally, and then Dr. Ondeyka decided to invest in her new hobby in a big way. She joined with other agility-enthusiasts to buy a 32,000 sq. ft. indoor sports facility where they could train year-round while also renting out the facility for other sports. Dr. Ondeyka said it’s still surreal to be a small business owner, but she is happy to expand her hobby into a side job that helps her decompress after hard shifts. Looking back, Dr. Ondeyka is grateful that her corgi adoption plans went a little awry. Adding Sawyer’s larger-than-life personality to her family ended up leading her to a whole new world with new friends that has proven to be a great outlet. “I was definitely not expecting the dog that I got, but he was definitely the dog that I needed,” Dr. Ondeyka said.

Fun Things with Dr. Ondeyka

1. Favorite Holiday: Halloween! We are very into horror movies, and we go all-out with our front yard decorations. This year we’re doing a graveyard theme with big animatronics and fog machines. We always have at least 100 kids come by.

2. Favorite Horror Movie: The first Halloween, although, I love the second one, too. Those are classics.

3. Favorite TV Show: Anything true crime that I can find on Netflix. There are a bunch of Finnish and Icelandic detective shows that are dubbed over with English and I love all of them.

4. Guilty Pleasure: Pinot noir and unhealthy snacks!

5. Looking Forward To: Fall—it’s my favorite time of year.
ACEP4U: Getting Down to Business

by JORDAN GRANTHAM

In late August, ACEP hosted its first-ever Independent EM Group Master Class, known as the Indy Class. This course convened experts from across the country to instruct on the ins and outs of successful small group management, offering attendees the opportunity to learn more business administration while getting firsthand advice on how to face the challenges of running an independent practice group. Organized by course co-directors Lisa Maurer, MD, FACEP, and Jamie Shoemaker, MD, FACEP, the Indy Class is one of the various ways ACEP is executing its new strategic plan, ensuring emergency physicians feel supported. A key facet of the plan’s Advocacy pillar is to provide members with more opportunities to learn about the business of emergency medicine. At the same time, the Career Fulfillment pillar is focused on tackling tough issues that lessen job satisfaction. For many emergency physicians, the growing consolidation in medicine and the lack of physician autonomy is a source of frustration. This course was created to pull back the curtain on independent group management and teach the business of emergency medicine in order to offer a viable option for those who are looking for a career outside the large group staffing models.

Like many great ideas, this one started with a few thoughts written on the back of a napkin. Drs. Shoemaker and Maurer realized ACEP did not have many practical resources to offer its members with ambitions of starting their own groups or strengthening their existing independent groups. The ideas scratched on that napkin grew into the foundation of the Indy Class schedule.

For young physicians Andrew Langille, DO, and Jonathan Ford, MD, FACEP, winners of this year’s Indy Class scholarships, the opportunity to learn from those with extensive experience managing small groups was too good to pass up.

Dr. Ford is one of the partners of a growing independent group in West Texas who wanted to learn more about managing a business. When he heard about the new Indy Class, the curriculum was just what he needed to become a more knowledgeable partner who could help his group grow during these turbulent times.

Dr. Langille is a senior resident in Tennessee who trained with a small democratic group. That experience was so positive that it inspired him to work toward starting his own independent group. For him, the Indy Class scholarship was a chance to gain necessary business skills needed to start a group while gaining access to the resources needed to work toward his goals.

The Indy Class sessions were comprehensive, covering as much as possible in a few short days: how to start an independent group, potential pitfalls, budgets and projections, payment models, vendor management, hospital and employee contracts, staffing, retention, payer trends, and more. The course was a mix of 30-minute lectures and breakout discussions, allowing all attendees to network, interact, and ask specific questions to the faculty and other experts at the conference. Drs. Langille and Ford were treated to a veritable firehose of valuable information, and they did their best to soak it all up.

“Those are things that had always been nebulous concepts to me,” said Dr. Ford. “And now I’m really starting to take some concrete features about what I need to do for my group to help us prepare to use these lessons.”

“I've learned there is a lot that I need to learn,” joked Dr. Langille. “[I learned] about the nuances of starting your group and things you need to think about in terms of billing and coding. There’s a huge change coming in January 2023 and [we’re learning] what that’s going to look like.”

“Sometimes you don’t know what you don’t know,” Dr. Shoemaker agreed. “Even us, as a faculty for the conference—we were listening to the sessions. I was learning new things as well.”

Drs. Shoemaker and Maurer wanted to offer Indy Class scholarships for young physicians because they had benefitted so much from ACEP educational experiences when they were just starting out. As a result, both have gone on to become reimbursement experts for the College and they wanted to pay it forward to the next generation.

Drs. Ford and Langille are both eager to take on leadership roles within their perspective communities. They wanted to attend the course so they could learn firsthand and then go back and share the helpful information with their colleagues.

Like most residents, Dr. Langille is concerned about the future of the EM workforce. He viewed the Indy Class content through that lens, absorbing lessons he could take back to share with his fellow residents.

“I’m so glad ACEP is doing this because we need to have more young physicians in the know about small but democratic groups and how to run those effectively,” Dr. Langille said.

“Emergency medicine has been largely changed by our predecessors and it’s going to continue to shape and change. I want to make sure that I’m at the forefront of that. I think ACEP is actually cultivating that by having young physicians come in and get exposure to [the Indy Class], especially residents like myself.”

Dr. Ford views being part of a small group as a lifestyle decision. He wants to learn everything he can about managing an independent group so he can help his group succeed and preserve his way of life for many years to come.

“I really believe in the small group,” said Dr. Ford. “When I’m happy at my job and I feel fulfilled at my job and I feel like I have some control over my job, I feel like I’m better at all those things in life. So not only is it helping me personally, but it’s helping the lives I touch and the ones I see every day, like my family and the thousands of patients I take care of every year.”

JORDAN GRANTHAM is senior content manager at ACEP.
In 2012, the retail store Target inadvertently informed a father that his young daughter was pregnant. The few who knew this before him were the daughter, her mother, and Target’s new artificial intelligence (AI) algorithm. After half a century of failed starts, the AI revolution had begun in earnest. The genie was effectively out of the bottle.

In statements that echo the early era of the internet, many businesses conflate adoption of AI today with survival tomorrow. This sentiment, or warning, is the same for emergency physicians and the emergency department (ED) ecosystem. Dismiss AI’s future impact on your practice and risk the same as those who once dismissed the internet’s potential impact on health care.

Sentient Robots?
Don’t be fooled by its name. AI programs and algorithms don’t think, understand, or comprehend. At its core, AI does one thing: categorize patterns in data. Enormous matrices filled with data vectors are ingested and predictions made that either classify what group a new data vector might belong to or how much that vector might influence the outcome you’re interested in, based on deciphered data patterns. “Self-driving” algorithms merely ingest a matrix of image pixel data vectors, match it to the most probable known pattern, and output the action for that pattern (e.g., “apply brake pedal”). All these programs do is detect a pat-
AI in Health Care

There are still big issues with AI in health care. First, while 70 percent accuracy might be career changing for a marketing executive, anything less than 99 percent fails to meet any but the most relaxed clinician’s standards.1 Sec- ond, we’ve heard horrible stories of bigotry and ethnic marginalization by AI programs.2 Finally, the inaccuracy of these programs can be ridiculously obvious despite high algorithm confidence.3 During COVID, thousands of clinical programs were created and nearly all of them failed. One of the greatest cited reasons for failure was unbalanced teams with either too few clinicians or too few AI experts, or both. Although there is growing recognition of the need for all stakeholders (including the physician users) to audit these programs at every stage, inclusion of practicing clinicians during AI creation remains uncommon outside of advisory boards with very limited influence.

Unfortunately, there are some ugly counterpoints to our disagreement with which we must contend. Different clinicians managing the same patient often make very different de- cisions, a phenomenon known as interprac- titioner variability. However, variability even exists within a single practice, with some physicians making decisions depending on the time left in their shift, fatigue from con- secutive shifts worked, the recipient of their sign-out, whether they recently heard about a nasty medical malpractice lawsuit, or any number of things that bear absolutely no in- fluence on the actual probability of disease. This is not to mention well-known examples of gender and ethnic discrimination by clini- cians. Sadly, our own decision-making is also inherently flawed. In fact, one might argue it’s far easier to bias out of an algorithm than out of a human being.

Interpractitioner variability is one of the greatest inspirations pushing AI into the greatest influence on the actual probability of disease. Yet, the following examples show how incredible the results can be.

Using AI, programs have been created that detect cargo containers containing smuggled goods, assess a city for hurricane damage in a few hours instead of a few days, and predict when a police officer’s radio channel should be activated seconds before the 9-11 call is made. With such huge successes comes the confidence to grasp for the holy grail. Whether the aspiration is to save lives, save money, or grab a slice of one the most lucrative business sectors, AI experts have turned their focus on health care.

AI programs are notorious for having “black box” op- erations where even the programmer is unsure how the computer derived the solution.4 Even when the mathematics applied to find the solu- tion are readily reviewed, it can practically require a master’s degree in computer science for AI to understand it well.

Several programs have been created, de- ployed, and even sold to other companies with no supporting published studies. Many deserve more inspection because even when lab testing shows great results, AI algorithms can be rife with things such as correlation traps, biases, and self-fulfilling prophecies that cloak serious errors. Currently, most cli- nicians lack sufficient understanding of these programs and their genesis, or of how to in- terpret the results well enough to unveil these errors during their clinical work.

The incorrect response is to lean away from AI. The potential benefit of these pro- grams is too great and the quality of predic- tions improving too quickly to expect we will have more than six or seven years before they will be an integral part of clinical practice. But if patient-focused clinicians are not leading this era, others will. It is vastly important for expe- rienced, practicing clinicians to be involved at all stages of algorithm development. Phys- icians need to ensure that recommendations are delivered in a way such that their use or dismissal is easily defensible, causation is as- sured with all correlations, and the results are both understandable and useable by the aver- age clinician.

AI programs can help us practice with more confidence, less liability, less variability, and most importantly, better clinical outcomes. Our participation and open discussion of their inner workings is what will make the difference.

References


DR. PANGIA serves as a regional medical director for emergency hospitalist, and telemedicine as well as the regional analytics director for TeamHealth. He is a practicing emergency physician, data scientist, and a Master of Science candidate in artificial intelligence at Johns Hopkins University. He’s been engaged in pre-hospital care since 1992 and an emergency physician since 2008.
they are your only voice in those arenas. The AMA convened a joint CPT/RUC work group to refine the guidelines based on accepted guiding principles. Although the full CPT code set for 2023 has not yet been released, the AMA recognized that specialties needed to have access to the documentation guidelines changes early to educate both their physicians on what to document and their coders on how to extract the elements needed to determine the appropriate level of care based on chart documentation. Additionally, any electronic medical record or documentation template changes will need to be in place prior to January 1, 2023, to maintain efficient cash flows and ensure appropriate code assignment.

ACEP was able to convince the Joint CPT/RUC Workgroup that time should not be a descriptive element for choosing ED levels of service because emergency department services are typically provided on a variable intensity basis, often involving multiple encounters with several patients over an extended period of time. It would be nearly impossible to track accurate times spent on every patient under concurrent active management.

The 2023 E/M definitions have been updated to reflect how Medical Decision Making determines the level of billing. The critical care codes (99291 and 99292) were not impacted by the 2023 documentation guideline changes.

**New Coding Rules: Medical Decision Making Will Determine Your Visit Level and 85 Percent of the Typical Group’s RVUs**

Medical decision making (MDM) in 2023 is too complicated to fully address here, but it will still be based on the modified historic three MDM components with the eventual level assigned scored using the highest two of three components:

1. **Number and complexity of problems addressed.**—There is no longer a major distinction made for additional workup planned, and no longer points for a new problem to the examiner. The 2023 requirements will be less numeric and more qualitative, including terms such as acute uncomplicated injury, acute illness with systemic symptoms, and chronic illness with severe exacerbation.

2. **Amount and/or complexity of data to be reviewed and analyzed.**—This component has the most changes in clarification, including scoring for ordering or reviewing each unique test. New changes include points awarded for a review of prior external notes and use of an independent historian, in addition to points for testing you considered but did not order (such as a pediatric head CT for a minor blunt injury).

3. **Risk of complications and or mortality or mortality of patient management.**—This is still based on the previous “table of risk” with the highest element of risk prevailing for the level assigned. At the moderate risk level, important changes for 2023 include diagnosis and treatment significantly limited by social determinants of health and prescription drug management considerations. At the high-risk level, credit is now given for decisions regarding hospitalization or escalation of care.

Beyond the new MDM table, other favorable 2023 language includes:

- “The final diagnosis for a condition does not in itself determine the complexity or risk as extensive evaluation may be required to reach the conclusion that the signs or symptoms do not represent a highly morbid condition.”
- “Multiple problems of a lower severity may, in the aggregate, create higher risk due to interaction.”
- “Ordering a test may include those considered but not selected after shared decision making. For example, a patient may request diagnostic imaging that is not necessary for their condition. The discussion of the lack of benefit may be required. Alternatively, a test may be normally performed, but due to the risk for a specific patient, it is not ordered. These considerations must be documented.”

### TABLE 1: 2023 ED E/M Definitions

<table>
<thead>
<tr>
<th>ED E/M CODE</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>99281</td>
<td>ED visit for the evaluation and management of a patient that may not require the presence of a physician or other qualified health care professional.</td>
</tr>
<tr>
<td>99282</td>
<td>ED visit for the evaluation and management of a patient, which requires a medically appropriate history and/or examination and straightforward medical decision making.</td>
</tr>
<tr>
<td>99283</td>
<td>ED visit for the evaluation and management of a patient, which requires a medically appropriate history and/or examination and low medical decision making.</td>
</tr>
<tr>
<td>99284</td>
<td>ED visit for the evaluation and management of a patient which requires a medically appropriate history and/or examination and moderate medical decision making.</td>
</tr>
<tr>
<td>99285</td>
<td>ED visit for the evaluation and management of a patient, which requires a medically appropriate history and/or examination and high medical decision making.</td>
</tr>
</tbody>
</table>

**NEW CODING RULES: HISTORY AND EXAM REQUIRED ONLY AS MEDICALLY APPROPRIATE**

The prior requirements to document a complete history and physical examination will no longer be deciding factors in code selection in 2023, but instead the 2023 Guidelines simply require a medically appropriate history and physical exam. That leaves medical decision making as the sole factor for code selection going forward. These changes are illustrated by the 2023 E/M code descriptors, which appear above.
THE BEST WAY TO PREDICT THE FUTURE IS TO CREATE IT
Promoting innovation in emergency medicine

by RANA KABEER MD,MPH AND JOHN DAYTON, MD, FACEP, FAEM

The second annual Stanford Emergency Medicine Innovation Symposium (STEMI X) was held in May 2022. All 400 emergency physicians and other health care stakeholders gathered virtually for keynote talks and roundtable discussions focused on how emerging technology could improve emergency care. Topics included digital health, artificial intelligence, machine-learning (AI/ML) algorithms, medical devices, and precision-based care for patients.

STEMI X also featured “Pitch ‘EM,” a pioneering pitch competition. Like “Shark Tank,” health care entrepreneurs had 90 minutes to pitch their idea to improve care in the emergency department. The winning team received $5,000 and mentoring with Stanford’s Emergency Medicine Partnership Program.

Nearly 30 companies competed to be one of the six finalists who pitched their innovation to the live STEMI X audience. The six finalists presented innovations featuring medical devices, AI, teletriage, and remote patient monitoring. The contest was judged by six venture capitalists representing firms that invest in health care innovation; five of these judges were physicians.

The Finalists
CPR Therapeutics
Dr. Norman A. Paradis, MD, is an emergency physician, CEO, and founder of CPR Therapeutics (CPR-T), creators of an innovative compression-avoiding vest for cardiopulmonary resuscitation (CPR), the mainstay treatment for out-of-hospital cardiac arrests. Their CPR-T solution is safe, easy to use, and delivers a patient’s life-saving high quality compressions delivered via a circumferential patient vest. This smart device avoids rib trauma and is able to provide CPR directly to the chest. Dr. Paradis’s group is developing their CPR-T Radiolucent Cath Lab Vest which will allow patients to obtain active compressions and life-saving resuscitative measures while undergoing critical revascularization procedures in the cardiac catheterization lab.

Hero Medical Technologies
Hero Medical Technologies seeks to improve and streamline patient care for individuals with head injuries from early injury through hospitalization. They offer a unique bandage, which doubles as a wound dressing and monitoring system. Hero Medical seeks to eliminate potential gaps in vital sign monitoring as well as hemorrhage control for the 1.4 million patients with traumatic head injuries seen in the hospital yearly, who account for $25.8 billion in hospital admissions and $76.6 billion in overall healthcare related costs for the head injury market nationwide. They’ve received funding from Johnson & Johnson Innovation Labs and an FDA grant. They’ve piloted their device with both the Baylor College of Medicine and the Perelman School of Medicine at the University of Pennsylvania.

EM Guide
Dr. Norman A. Paradis, MD, is an emergency physician, CEO, and founder of CPR Therapeutics (CPR-T), creators of an innovative compression-avoiding vest for cardiopulmonary resuscitation (CPR), the mainstay treatment for out-of-hospital cardiac arrests. Their CPR-T solution is safe, easy to use, and delivers a patient’s life-saving high quality compressions delivered via a circumferential patient vest. This smart device avoids rib trauma and is able to provide CPR directly to the chest. Dr. Paradis’s group is developing their CPR-T Radiolucent Cath Lab Vest which will allow patients to obtain active compressions and life-saving resuscitative measures while undergoing critical revascularization procedures in the cardiac catheterization lab.

Hero Medical Technologies
Hero Medical Technologies seeks to improve and streamline patient care for individuals with head injuries from early injury through hospitalization. They offer a unique bandage, which doubles as a wound dressing and monitoring system. Hero Medical seeks to eliminate potential gaps in vital sign monitoring as well as hemorrhage control for the 1.4 million patients with traumatic head injuries seen in the hospital yearly, who account for $25.8 billion in hospital admissions and $76.6 billion in overall healthcare related costs for the head injury market nationwide. They’ve received funding from Johnson & Johnson Innovation Labs and an FDA grant. They’ve piloted their device with both the Baylor College of Medicine and the Perelman School of Medicine at the University of Pennsylvania.

EM Guide
Dr. Norman A. Paradis, MD, is an emergency physician, CEO, and founder of CPR Therapeutics (CPR-T), creators of an innovative compression-avoiding vest for cardiopulmonary resuscitation (CPR), the mainstay treatment for out-of-hospital cardiac arrests. Their CPR-T solution is safe, easy to use, and delivers a patient’s life-saving high quality compressions delivered via a circumferential patient vest. This smart device avoids rib trauma and is able to provide CPR directly to the chest. Dr. Paradis’s group is developing their CPR-T Radiolucent Cath Lab Vest which will allow patients to obtain active compressions and life-saving resuscitative measures while undergoing critical revascularization procedures in the cardiac catheterization lab.

The judges were impressed with the EM Guide group’s clear vision and unique idea—awarding them the top prize. EM Guide’s ability to save unnecessary medical bills and reserve hospital beds in overcrowded hospitals would have the most impact on the companies that pitched their ideas.

STEMI X and Pitch ‘EM was well received. One of the Pitch EM judges, Dr. James Eadie—an emergency physician and Managing Director for Sante Ventures—and remarked that

“There are not many groups doing innovation in ER and yet the need is huge." STEMIX is partnering with ACEP to host HackED, a hackathon at ACEP22 in San Francisco. This event will be free for attendees and address how emergency physicians should include health care data from wearables and home monitoring equipment in their patient management. This multi-day event will take place in the Exhibit Hall and feature team formation, coaching and discussions, and available workspaces. HackED will culminate with teams presenting their ideas and innovations in a pitch competition 1 p.m. on Oct. 5.

DR. KABEER is a PGY-4 and Chief Resident at Stanford’s Department of Emergency Medicine. In addition to his role as co-chair of the Stanford Airway Review Committee, he is a member of the Emergency Care Health Services Research Data Coordinating Center (HSR-DCC), researching the integration of machine-learning into emergency cardiovascular care. You can find him on Twitter (@RanaSays).

DR. DAYTON is the first Medical Innovation Fellow with Stanford’s Department of Emergency Medicine. He co-leads their innovation partnership program (STERP), serves as a Board Member for AngiMD, works as a physician consultant for Zuz Health, and writes about healthcare innovation.
What does your program offer that residents can’t get anywhere else?

We offer a training experience in a beautiful city that focuses on clinical excellence, professionalism, and resident well-being in the pursuit of a fulfilling career in emergency medicine. We also offer a fully published schedule for our residents at the beginning of the year in order to make scheduling a resident’s personal life easier. This year long schedule also incorporates two weekends off a month per EM block to maximize resident wellness. Our clinical experience offers residents a real-world community setting at a tertiary care hospital that allows the luxury of multiple specialties and consultants in the hospital while also allowing residents to practice in resource-limited environments like our free-standing EDs.

What are some fun activities residents like to partake in or recently participated in?

Our residents enjoy the great outdoor activities our city has to offer. The city of Jacksonville has a plethora of activities like the beach, the river, year-round golf, etc. It’s a city that’s great for residents no matter what stage of life they’re in (single, married, with children, and everyone in between).

How should potential applicants learn more about your program?

Potential applicants can visit our social media pages to get a more candid glimpse into our daily operations. Feel free to DM us with any questions!

- Edward A. Descallar, MD, FACEP

The class of 2025.

---

Critical decisions in emergency medicine

24/7 Access to the Full Critical Decisions Library

That’s 36 issues worth an astounding 180 AMA PRA Category 1 Credits™ when you subscribe today.

The American College of Emergency Physicians is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians. The American College of Emergency Physicians designates this enduring material for a maximum of 5 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

“Is the Critical Decision library worth the money?”

Critical Decisions is accredited by the ACCME—it’s why the statement above says it. 180 is 180 issues and 5 credit hours per issue. It’s 5 x 36 for a total of 180.

Subscribe Today! | ACEP.org/CDEM | 844.381.0911

Available in Print and Online

---

Badge of Honor

Now more than ever, the FACEP distinction allows you to show your pride and commitment to EM as you wear this badge of honor for your specialty.

Find out if you are eligible

acep.org/facep

Apply Today!
Emergency physicians must be skillful at performing certain high-risk, low-volume procedures. One of these procedures is emergent skull trephination, or burr hole placement, to decompress an expanding epidural hematoma. We are not aware that the procedure is taught routinely in emergency medicine residencies. It is not part of the Emergency Medicine Defined Key Index Procedure Minimums for board certification by the ACGME. According to the 2019 Model of the Clinical Practice of Emergency Medicine, intracranial hemorrhage is listed as a “critical” acuity. However, trephination to relieve pressure caused by epidural hemorrhage is not listed as a procedural skill integral to the practice of emergency medicine. While the list is not considered comprehensive, there are serious implications of the emergent presentation of this condition that would benefit from widespread training on this skill.

There is a body of medical literature that suggests substantial outcome benefit when the procedure is appropriately employed. Multiple small studies and case reports indicate improved results in cases of expanding epidural hematomas with early intervention by emergency physicians.

One study in 1996 assessed outcomes associated with traumatic epidural hematomas in 21 patients. The authors found that patients who underwent a drainage craniotomy in less than 70 minutes had a better recovery than those who had one at 90 minutes or more. A case described in ACEP Now in 2017 detailed the successful employment of emergency department trephination in a two-year-old male with an excellent outcome. Comparable outcomes have been found in similar studies. If left untreated, the reversal of symptoms becomes more difficult, and complications, including fatality, are positively correlated with increasing degree of uncal herniation.

Indications

The presentation of epidural hematoma is variable. Classic symptoms that include a lucid interval between two episodes of loss of consciousness are said to occur only 20 percent of the time. In general, emergency department trephination should be considered in patients with clinical decline heralded by loss of consciousness—Glasgow Coma Scale less than 8—with or without ipsilateral anisocoria in the presence of a known epidural hematoma, without available neurosurgery. Whenever possible, neurosurgical consultation should take place prior to the initiation of the procedure, and a computed tomography (CT) scan should ideally be obtained prior to initiation of the intervention.
In Memory of My Friend and Mentor, Dr. Jim Roberts

by ANTHONY S. MAZZEO, MD, FACEP

It was my great honor to work and learn beside James Roberts, MD, FACEP, FACMT, FAEM, CMRO, who left us too soon on July 22, 2022. Jim was my teacher, mentor, and friend for more than 20 years. I am humbled to be asked to write a few comments to memorialize Jim.

Jim’s list of accomplishments and accolades in our specialty is truly massive, but his personality and character are what made him such a unique and memorable human being. He was constantly curious, kind, generous, endearingly quirky, and always brimming with pride for his family. In emergency medicine, Jim carried himself with the swagger of learned experience and earned confidence without ever losing his trademark humility and empathy.

You didn’t have to spend much time with Jim to recognize that he had a heart of gold, which is what drew so many to him. Those of us who worked for JR came and stayed because we trusted him. He was relentless about providing the highest quality emergency care for the underserved and ensured his team was appropriately recognized, valued, and compensated for the difficult job we performed with limited resources under challenging circumstances. On a personal level, in addition to clinical excellence, he consistently stressed the most important outside-of-work priorities for his team and mentees: family, friends, humility, and wellness.

As a pioneer in our specialty, Jim’s jaw-dropping CV was filled with firsts. He was one of the first board-certified emergency physicians in the country, helping forge a path for a fledgling specialty of forward-thinking physicians who first recognized the clear need for the emergency physician. He pioneered and formalized the concept of emergency physicians performing the many procedures we now take for granted as ‘ED procedures.’

Among countless other accomplishments he co-authored one of the premier texts of the specialty (Clinical Procedures in Emergency Medicine and Acute Care) and helped found the Emergency Medicine Residents Association, Jim trained thousands of emergency physicians along with thousands more medical students, nurses, and administrators.

Jim was a bedrock of clinical competency whose breadth of expertise was staggering. His influence on our specialty is massive, but his personality and character are what made him such a unique and memorable human being. He spoke and wrote on countless clinical topics with a wisdom and charisma that earned him deserved icon status within our specialty.

Even as Jim pulled back from practicing bedside emergency medicine in his later years, he continued to influence emergency medicine through his prolific teaching and writing. Jim’s writings helped to steer the course of emergency medicine for decades. The loss of Dr. James Roberts leaves a significant void in emergency medicine. As a specialty, we should collectively pause to absorb the magnitude of his impact and influence and remember the man he was. Our patients and our specialty are better off because of Jim’s work, the trails he blazed, and the manner in which he passionately poured his wisdom into future leaders until the end. If Jim could read this, he would clarify that he’s not leaving a void—he’s simply passing the torch to the rest of us. ☯

DR. MAZZEO is vice chair of clinical operations and professor of clinical emergency medicine at Penn Medicine Hospital.

1. T-STRIP approximates wound edges & reduces wound tension.
2. Apply topical skin adhesive through T-STRIP to seal and protect the wound.
3. T-STRIP and TSA simply slough off in 8-14 days.

NO NEEDLES | NO SUTURES | NO FOLLOW UP

www.TheTstrip.com
info@theTring.com

©2021 TRing. All Rights Reserved.
Procedure Description
On patients, the skull thickness should be assessed utilizing CT and the drill depth set. The procedure site is typically located approximately 2 cm superior and 2 cm anterior to the tragus. A 4-cm vertical skin incision is made. A curved mosquito clamp or periosteal elevator will assist in visualizing the skull. One type of drill that has been described in the literature is the Galt trephine, which has a T handle that is used to create hand pressure coupled with a twisting motion to cut into the skull. Figure E shows the instrument we have used. The Galt trephine will create a circular piece of bone that can be removed either with the periosteal elevator or a mosquito clamp. The bone fragment should be placed in saline. At this point, the blood should drain spontaneously. But if needed, small tubing connected to a syringe can be inserted into the wound to aspirate blood.

Creation and Use of Training Model
In order to facilitate training, we first used the Galt trephine on an embalmed cadaver model. However, we learned that it required significant effort and time to enter the epidural space on the cadaver. Additionally, we recognized that the cadaver model was limited in availability and portability as a training model for physicians. So, this led to conceptualizing the simple, inexpensive model described below. Further, we were able to utilize the model as a procedural trainer in a recent mass casualty incident training exercise at Rocky Vista University College of Osteopathic Medicine in Parker, Colorado.

The model we created is constructed of a model brain (Figure A), an ice pack (evacuated of fluid and injected with simulation blood), cling wrap, tape, 3-inch-wide fiberglass casting material, and a repairable, simulation skin wrap.

The ice pack segments are drained of their fluid with an 18G needle and 10-cc syringe. Simulation blood, which can be commonly purchased online, is mixed with water to approximate the consistency of real blood and is then injected back into the segments using the same 18G needle and 10-cc syringe (Figure B). Each segment holds approximately 8 cc of simulation blood. The three continuous ice pack segments are then wrapped with cling wrap and secured to the brain model bilaterally in the temporal regions using strong adhesive tape (Figure A). Fiberglass casting material is molded around the model and blood packets to create a simulated skull, as seen in Figure C. After the fiberglass has dried and hardened, the repairable, simulation skin is wrapped around the skill model (Figure D).

This model results in a burr hole procedure that can be reproducibly performed. The model can provide physicians with a safe way to develop knowledge and muscle memory of a low-volume, high-risk procedure that would otherwise be typically left to didactic instruction and in-the-moment training.

We employed this model during the mass casualty incident training at Rocky Vista University College of Osteopathic Medicine. Medical students were provided a patient case presenting with an expanding epidural

FIGURE E: Medical students simulating the burr hole procedure at Rocky Vista University College of Osteopathic Medicine, MCI training.

FIGURE F: Transparent plastic bag, two inch by two inch (resealable) from Amazon.com—$7.99.

FIGURE G: Silicone skin pad from Amazon.com—$23.99 (per 20pcs).
and his orphan.”

The VA M ISSION Act provides Veterans with the ability to receive care more easily in non-VA based community emergency departments and urgent care centers. Given the flexibility in choice for our Veterans to seek care anywhere, even outside the VA system, why choose the VA? In short, VA emergency departments and urgent care centers are geared to our Veteran population and their needs. Over 47 percent of our two million visits are Veterans aged 65 years or older. Over 41 percent of all visits are for patients with comorbid mental health conditions. The VA does not seek to be the premier pediatric or trauma emergency department in the country—that is done very well at community emergency departments. However, we are focused on being the premier geriatric and mental health emergency departments for Veterans. To date, 34 VA emergency departments have received ACEP’s Geriatric Emergency Department Accreditation, making VA the largest integrated health care system with specialized geriatric emergency care. In the VA, we recognize the differences in experience that make our Veterans unique and lead to different care needs, and we seek to cater to them with our health care and meet these special needs. We link behavioral health with primary care, provide whole health services, and are utilizing our unique position as a federal health care system to grow tele-emergency care and meet our Veterans wherever they are. This focused expertise found within the VA system has translated to amazing outcomes for our Veterans. A February 2022 study from Stanford University found that Veterans taken by ambulance to VA emergency departments had a significantly lower mortality rate than those treated at non-VA emergency departments. Veterans can get care in any ED in the country, as with any other visit for acute, unscheduled care. We want our Veterans to seek care appropriately at the nearest community emergency department or urgent care. We know they are in good hands with our community partners. But it is the VA emergency departments and urgent cares that are designed for them. For a Veteran, walking into a VA medical center, outpatient clinic, or into one of emergency departments and urgent care centers should feel like coming home. The culture provided by VA staff for our patients will have a familiarity that is hard to describe without walking a mile in the shoes of a Veteran.

How Non-VA Emergency Physicians Can Help
We want to reconnect Veterans who are receiving care in the community back to the VA system. We want our Veterans to receive care that is made for them, from those that know their history and have the resources and ability to coordinate their ongoing care needs. You can help us educate Veterans on the services offered by VA. We have created brochures outlining what we offer and are making it easier for the community and our Veteran population to understand when and where to seek care. We are asking you to help us in identifying Veterans in your emergency department and getting them these brochures and resources. Together we can educate Veterans on when and how to seek care. It is our goal to provide the right care, at the right place, at the right time for Veterans, and we need your help to see this goal through. By referring Veterans back to the VA system, we can help reduce the risk of medication misadventure because we have their complete medication and past medical history on file. We can more easily set them up for appropriate follow-up and continuity care as an integrated health system. And we may have a greater potential of being able to avoid admissions for Veterans since we are able to coordinate care and have access to hospital-at-home-type resources. This would also reduce the burden on community EDs and overall make it easier for the community ED provider to deliver the right care for the Veteran.

U.S. Department of Veterans Affairs. He is also the chief of emergency medicine at the Veterans Affairs Health System of Pittsburgh and an assistant professor at the University of Pittsburgh School of Medicine.

DR. GEIGER serves as executive officer for emergency medicine for the U.S. Department of Veterans Affairs. He is a United States Marine Corps veteran.

DR. JETTER serves as program manager for emergency medicine at the U.S. Department of Veterans Affairs. He is also a medical student at the University of Florida College of Medicine in Gainesville, Fla.

DR. KESSLER serves as executive director of emergency medicine for the U.S. Department of Veterans Affairs. He is also the chief of emergency medicine at the VA Greater Los Angeles Healthcare System.

Please use this QR code to notify the nearest VA of Veteran emergency treatment as soon as possible, in order to establish eligibility and begin their coordination for care or transfer to a VA facility.
How military medicine has influenced civilian medicine

By SOPHIA GÖRGENS, DO

An Amtrak train struck a dump truck on June 27, 2022, derailing and scattering its aluminum-colored cars into the lush green terrain, killing four people and injuring nearly 150 more. Multiple EMS agencies worked together, including the crews from 28 ambulances, 19 fire trucks, and 17 helicopters. These first responders quickly began triaging, prioritizing those with life-threatening injuries and transporting them to hospitals near the small town of Mendon, Missouri. Medics applied tourniquets to mangled limbs, placed tranexamic acid (TXA) coated hemostatic dressings, and gained access with intravenous (IV) devices when venous access was difficult. Next, medics worked to clear the hot zone. More stable patients were transported to a nearby school that was converted into a casualty collection point. Empty for the summer, the school provided relief from the heat and a safe place for further assessment and treatment of patients. Meanwhile, as the most critical patients arrived by helicopter at the nearest trauma center, where the emergency department team transfused blood in a 1:1:1 ratio of platelets to plasma to packed red blood cells (pRBC).

How did these lifesaving interventions arrive in a small town in Missouri? They were best practices adapted from military medicine by the civilian sector. Although military and civilian health care systems usually operate separately in the United States, the crossover of academia and research has proven valuable to both systems. Emergency physicians (EPs) are particularly valuable in the military for their expertise in trauma but also for their breadth of knowledge ranging from infectious diseases to environmental exposures and even psychiatric conditions. In the civilian sector, emergency medicine has benefited from the military’s advances in mass casualty response, trauma care, resuscitation, and pain control. Roderick Fontenette, MD, FACEP, a retired Lieutenant Colonel from the air force, has seen the growing collaboration between the civilian and military sectors occur during his career. “It’s a beneficial relationship for both sides—working in civilian hospitals, we keep up our clinical skills while stateside and in return, we bring with us new and proven critical care techniques from the battlefield.” Joshua Stilley, MD, FACEP, Chief of Division of EMS at the University of Missouri as well as the medical director for Chariton County Ambulance, whose district this crash occurred in, adds, “Other than those invaluable techniques, one of the best things we’ve learned in prehospital medicine from the military is the staged approach to triage—extracting patients from the low-resources setting of the disaster and moving them to casualty collection points where we can better assess their needs.”

Mass Casualty Response

Mass casualty incidents (MCIs), where the number of patients exceed hospital resources and capacity, in the military commonly range from in the military active battle to roadside bombings or terrorist attacks. In the civilian sector, active shooter and terrorist attacks easily come to mind, but natural disasters such as wildfires or hurricanes, major motor vehicle collisions, and even a derailed Amtrak train can instantly strain a hospital system, especially if occurring in a small town whose population is less than the number of passengers affected by the crash. “Command structure is key in MCI events like the Amtrak crash,” Dr. Stilley says. “That’s something we learned from the military—directing resources where they’re needed, evacuating the scene, and managing the collaboration of multiple EMS systems and hospitals.” Lessons learned from military medicine have helped civilian communities develop response plans, including anticipatory guidance for second-wave victims, and refine training programs. When health care systems are overwhelmed in disasters, they may also have to resort to damage control resuscitation (attempts to achieve quick hemostasis until definitive care can be given) and damage control surgery (saving definitive surgery for later while controlling bleeding quickly to prevent fatal metabolic derangements from prolonged surgeries, or to care for large volumes of patients). Dr. Fontenette says that another damage control strategy he is starting to see utilized in civilian medicine is Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA). “Military EPs paved the way for civilian EPs to place REBOAs,” Dr. Fontenette says. While there was initially hesitancy about EPs placing REBOAs in the civilian setting, the military model was based on the idea that when there were multiple casualties an EP could place a REBOA while the surgeon was in the midst of surgery. The data on ideal patient population and efficacy of REBOA use in the civilian setting is still being defined.

Trauma Care and Resuscitation

In the battlefield, hemorrhage control is a life-saving intervention, but the usefulness of tourniquets, hemostatic dressing, and TXA have also been realized by civilian health care workers dealing with trauma. While tourniquets have proven beneficial in the military setting, civilian prehospital care has been slow to adopt this change. However, many communities are realizing the benefits of this hemorrhage prevention technique which saves limbs and lives with few complications if used appropriately, and are incorporating it into their bystander intervention education, such as through the Stop the Bleed program, and their prehospital care. “The Stop the Bleed program, which teaches the public about pressure and tourniquet use, is one of the most valuable things we integrated from the military,” Dr. Stilley says. “It’s simple first aid, but giving that knowledge to everyone, like the military did in its training, saves countless lives.”

Hemostatic dressings also first came to prominence in battlefield settings, but have since become widely adopted in the civilian sector. Hemostatic dressings made of primarily of minerals or polysaccharides (such as QuikClot or HemCon) act as either factor concentrators, procoagulants, or muco-adhesives, and help stem hemorrhage in the field by (used by EMS), in austere environments, or in the emergency department until definitive management can be obtained. These types of materials have also been successfully incorporated for hemorrhagic control of common emergency medicine complaints.

CONTINUED on page 16

OCTOBER 2022

ACEP NOW 15

ACEPNOW.COM

OCTOBER 2022

ACEP NOW 15

ACEPNOW.COM
such as epistaxis, post-surgical bleeding, and lacerations. Additionally, after its success in the military at decreasing mortality in patients with combat injuries, TXA has been adapted to civilian use for everything from trauma to epistaxis to post-partum hemorrhage, with various degrees of success that are not still fully studied.16–18

In severe trauma, hemorrhage control is only the first step; access must be obtained and resuscitation initiated. Given the difficulty of securing intravenous (IV) access in the field, battlefield medicine has been relying on intravenous access for decades, a method often preferred to venous cutdown.19,20 This method, useful for drawing some labs and blood products, and medication, has translated successfully to the care of civilian trauma and even medical patients when timely resuscitation is needed.7,10,15

Knowledge from military medicine revolutionized civilian trauma resuscitation—the previous paradigm of crystalloids or colloids was abandoned for a 1:1 ratio of plates to plasma to pRBC, the newest evidence points to a 1:1:1 was abandoned for a 1:3 ratio of plasma to resuscitation—the method, useful for drawing some labs and with metabolic derangements or coagulopathy. However, fresh whole blood likely has been relying on intravenous access for decades, a method limited use in the civilian setting due to blood donor logistics and risk of blood-borne infections. “Whole blood is in many ways the ideal resuscitation fluid,” Dr. Fontenette notes, and he hopes that low titer group O whole blood, which is unseparated blood with low IgM and IgG anti-A and anti-B antibodies, may prove more transferrable to civilian medicine.17,18

Moving Forward
Military medicine and civilian medicine are more intertwined than most people realize, especially during the golden hour of prehospital and emergency medicine. Although research provides the evidence to uphold new ideas, “Integration of military medicine into civilian medicine really happens in the clinical setting,” Dr. Fontenette says. “Between deployments, military physicians keep up their medical skills by working in civilian hospitals, and they bring their modes of practice with them.” Austere environments like the battlefield foster some of the most innovative ideas, and with the collaboration of EPs on both sides, the military’s openness to new initiatives and academia’s rigor in research can translate these lessons to civilian medicine.

References
For a ubiquitous intervention such as intravenous fluid resuscitation, it’s a surprise to see reassessment continuing apace. Since the inception of early goal-directed therapy, emergency departments (EDs) have been dumping fluids—typically 0.9 percent sodium chloride solution, into patients in ever-increasing quantities. Even as early goal-directed therapy has fallen out of favor, its ongoing evolution has discarded only the most invasive bits, while keeping early antibiotics and aggressive resuscitation.

0.9 percent sodium chloride is hardly physiologically equivalent to the intravascular circulation, nor does it specifically address electrolyte losses or variance in the setting of critical illness. The popularized treatment alternative remains so-called balanced crystalloid solutions. These solutions typically include some small amount of sodium chloride, but may also include sodium gluconate, sodium acetate, sodium lactate, calcium chloride, potassium chloride, or potentially even magnesium chloride. The pH of these solutions is closer to the normal physiologic value of 7.4, rather than the pH of roughly 5.5 seen with 0.9 percent sodium chloride.

Many trials have been published comparing the two types of electrolyte solutions, including those in the ED and in the intensive care unit (ICU). Just this spring, such a comparison has been published, and again, no statistically significant difference could be detected between 0.9 percent saline and balanced solution, in this case Plasma-Lyte 148.1 The most notable difference in thinking following this most recent randomized controlled trial is its accompanying updated systematic review and meta-analysis of the same topic. Taking stock of the entirety of all the high-quality randomized controlled trials, the authors of the meta-analysis pooled nearly 50,000 ICU patients together to develop a more precise estimate of any treatment effect associated with use of balanced crystalloid solutions. Despite this larger sample size, no statistically significant difference in mortality could be identified.

However, the story does not quite end there. The risk ratio from their pooled low-bias study cohort was 0.96 (95 percent CI 0.91 to 1.01), nonsignificantly favoring the balanced solutions. The authors then utilize a Bayesian approach to assessing the probability that balanced fluid solutions are superior. Based on a vague assumption that the prevailing observational evidence and opinion is insufficient to strongly tilt the results of any analysis, the authors conclude there is an 84.5 percent posterior probability that balanced crystalloids reduce mortality.

Considering that this analysis encompasses 35,000 patients and is only able to eke out such a minor advantage to treatment with balanced fluids, the absolute magnitude of any treatment effect must be quite small. These pooled studies are all from the ICU, limiting their generalizability to the ED. The simple way out is to say, “It doesn’t matter, and, if it matters, it only matters a tiny amount.” Conversely, sepsis is implicated as a leading cause of death worldwide, and significant volumes of intravenous fluid are given in emergency departments each day. Even a minuscule relative improvement in mortality—a rather important patient-oriented outcome—becomes a significant absolute excess in survival when multiplied across millions of lives. Whenever the option exists to choose a balanced solution, it is likely the ever-so-slightly better choice.

How Much Fluid to Administer

The next question, however, having made the choice of fluid, remains precisely how much to give. This is the question addressed by the Conservative Versus Liberal Approach to Fluid Therapy of Septic Shock in Intensive Care (CLASSIC) trial. In this trial, patients admitted to the ICU were randomized to standard care or a conservative strategy in which 250- or 500mL boluses were permitted only for objective evidence of ongoing and worsening severe hypoperfusion. The difference in fluid administered in the ICU despite these restrictions, however, was only about 1.5 liters over the first five days. Ultimately, the authors could not identify any specific advantage of one treatment strategy versus another.

Tucked within these data, however, were some interesting secondary analyses with potential relevance to the emergency physician. On average, patients had already received three liters of fluid prior to enrollment in the trial. However, approximately one-third of their cohort had received less than 30 mL/kg of fluid upon enrollment, while the remainder had received greater than that amount. In patients having received the lowest fluid resuscitation per body weight there was a 5.3 percent mortality advantage to allowing the standard liberal strategy in the ICU, while those aggressively resuscitated prior to enrollment displayed a 2.2 percent advantage to a restrictive strategy.

Neither of these advantages were statistically significant, and might have been affected by multiple potential confounding biases, but it does fit with a reassuring narrative: the fluid resuscitation commonplace in the emergency department may indeed be the necessary first step. Further data relevant specifically to early fluid administration is likely to be available from the Crystalloid Liberal or Vasopressors Early Resuscitation in Sepsis (CLOVERS) trial, which has seen early termination of enrollment in May 2022.

It’s all bad news for 0.9 percent saline, however, as the evidence works in its favor in the Resuscitation with Balanced Products in Patients with Trauma-Related Haemorrhagic Shock: Seck- Receiving Prehospital Care (RePHILL) trial. This is a randomized controlled trial in which trauma patients with hypotension thought to be related to traumatic hemorrhage received either prehospital blood and plasma or 0.9 percent sodium chloride. The total volume of fluids to be administered in the trial protocol was either two units of packed red blood cells combined with two units of 0.9 percent saline solution or one liter of sodium chloride.

In this physician-led prehospital service in the United Kingdom, the authors were able to enroll 4,323 patients prior to the onset of the SARS-CoV-2 (COVID-19) global pandemic. The enrolled population was primarily young and male, and the majority of patients were included as a result of severe injuries sustained in motor vehicle collisions. The primary outcome was a composite of mortality and inability to clear lactate within two hours of randomization, but the more likely relevant patient-oriented outcome is mortality alone. In this quite severely injured cohort with prehospital hypotension, overall mortality was 43 percent in those receiving blood products and 45 percent in those receiving saline.

As with any snapshot of evidence, this remains only a piece of the puzzle with respect to the utility of prehospital blood products in trauma. These authors do not parse out specific causes of death, and generally most patients were not in hemorrhagic shock on arrival at the hospital. This is presumably linked to the short transport times involved from the scene to definitive care, reducing the likelihood of exsanguination prior to hospital arrival.

The RePHILL trial fits in with other trials of prehospital plasma or prehospital blood products. It informs resource management for urban prehospital systems with short transport times. Replacing blood with blood has obvious face validity, but many other clinical scenarios have found conservative transfusion thresholds are not harmful. Early in the course of traumatic hemorrhage, with prehospital shock but substantial remaining reserve, aggressive early use of blood products may not be providing the hoped-for survival advantage. Future trials ought to illuminate at which point the resuscitation can switch from crystalloid to blood products.

References


Texting Clinical Photos

Practical considerations when sharing clinical images for treatment purposes

by CATHERINE A. MARCO, MD, FACEP

Case

A 69-year-old man presents from the assisted living facility with hip pain following a fall. He has a history of dementia and is oriented to name only. Radiographs show a left mid-shaft femur fracture. You call the on-call orthopedist, who asks you to text the radiographs.

Question: Can you text the images to the orthopedist?

There are numerous resources for answers to clinical questions. Clinical textbooks, such as Tintinalli’s Emergency Medicine: A Comprehensive Study Guide, or Rosen’s Emergency Medicine, are valuable resources for studying and answering basic clinical questions. Search engines may provide more current information.
of communication by mobile phone. HIPAA compliant images without identifiers should be used. If a securely encrypted texting service is not available, images should not be texted.

Practical Considerations

Administrative issues can be addressed using national and local policies. Short Message Service (SMS) messaging is not considered secure or HIPAA compliant. Institutions should provide encryption enabled messaging systems to provide a HIPAA compliant method.

References


Does the HIPAA Privacy Rule permit a doctor, laboratory, or other health care provider to share patient health information for treatment purposes by fax, e-mail, or over the phone?

Yes. The Privacy Rule allows covered health care providers to share protected health information for treatment purposes without patient authorization, as long as they use reasonable safeguards when doing so. These treatment communications may occur orally or in writing, by phone, fax, e-mail, or otherwise.

The U.S. Department of Health and Human Services (HHS) provides guidance on Health Insurance Portability and Accountability Act (HIPAA) compliance.

The AMA policy states that where possible, informed consent should be obtained before personally identifiable health information is used for any purpose. However, in those situations where specific informed consent is not practical or possible, either (1) the information should have identifying information stripped from it or (2) an objective, publicly accountable entity must determine that patient consent is not required after weighing the risks and benefits of the proposed use.

Re-identification of personal health information should only occur with patient consent or with the approval of an objective, publicly accountable entity.

The Privacy Rule permits a doctor to share patient information for treatment purposes over the phone only with the approval of an objective, publicly accountable entity.

During the COVID-19 Public Health Emergency, HHS has waived certain HIPAA exceptions to allow for ad hoc, non-HIPAA compliant communications without fear of a potential HIPAA violation.
Penn State Health Emergency Medicine

About Us:
Penn State Health is a multi-hospital health system serving patients and communities across central Pennsylvania. We are the only medical facility in Pennsylvania to be accredited as a Level I pediatric trauma center and Level I adult trauma center. The system includes Penn State Health Milton S. Hershey Medical Center, Penn State Health Children’s Hospital, and Penn State Cancer Institute based in Hershey, Pa.; Penn State Health Hampden Medical Center in Enola, Pa.; Penn State Health Holy Spirit Medical Center in Camp Hill, Pa.; Penn State Health St. Joseph Medical Center in Reading, Pa.; Penn State Health Lancaster Pediatric Center in Lancaster, Pa.; Penn State Health Lancaster Medical Center (opening fall 2022); and more than 3,000 physicians and direct care providers at more than 126 outpatient practices in 94 locations. Additionally, the system jointly operates various health care providers, including Penn State Health Rehabilitation Hospital, Hershey Outpatient Surgery Center, Hershey Endoscopy Center, Horizon Home Healthcare and the Pennsylvania Psychiatric Institute.

We foster a collaborative environment rich with diversity, share a passion for patient care, and have a space for those who share our spark of innovative research interests. Our health system is expanding and we have opportunities in both academic hospital as well community hospital settings.

Benefit highlights include:
• Competitive salary with sign-on bonus
• Comprehensive benefits and retirement package
• Relocation assistance & CME allowance
• Attractive neighborhoods in scenic Central Pennsylvania

FOR MORE INFORMATION PLEASE CONTACT:
Heather Peffley, PHR CPRP - Penn State Health Lead Physician Recruiter hpeffley@pennstatehealth.psu.edu

Penn State Health is fundamentally committed to the diversity of our faculty and staff. We believe diversity is unapologetically expressing itself through every person’s perspectives and lived experiences. We are an equal opportunity and affirmative action employer. All qualified applicants will receive consideration for employment without regard to age, color, disability, gender identity or expression, marital status, national or ethnic origin, political affiliation, race, religion, sex (including pregnancy), sexual orientation, veteran status, and family medical or genetic information.
Revitalizing Health Care, Together

Join Our Clinical Team

- Competitive Sign-On Packages
- Physician-Led Company
- Clinician Support
- Leading Benefits

Our dedicated recruiters are focused on one thing: finding you the right career fit. Scan the QR code to find your next position with SCP Health.

Now hiring Emergency Medicine physicians, nurse practitioners, and physician assistants.

Visit us at ACEP in booth #924.

Find Your Next Position
WHY WE’RE DIFFERENT

THESE THINGS ARE NOT THE SAME

We at US Acute Care Solutions are different, and likely in more ways than you’d expect. Our physicians all become owners, our clinical hours and workload are manageable, and our culture and camaraderie make both your work life and your home life better. We work in excellent hospital systems located in attractive cities nationwide. Our benefits, especially our retirement, are second to none.

Together, we can improve healthcare for our patients and ourselves.

Tina Latimer, MD, MBA, MPH
Richmond, VA
Johns Hopkins University Residency (2009)
President— North Division

“When my former group joined USACS in 2022 I didn’t know what to expect. But I have been truly impressed by the commitment to always do right by our patients and our people. Decisions are always evaluated based on whether patients will benefit or whether our people will benefit. Profit and growth are never part of the equation. Those two things are the byproduct of consistently doing the right thing. Joining USACS was right for my group for that reason.”

Learn more at: usacs.com
hematoma, as identified by signs and symptoms (initial loss of consciousness with lucid interval, followed by rapid decline in Glasgow Coma Scale and ipsilateral fixed and dilated pupil) and a provided CT scan image depicting an epidural hematoma. Once the indications for the burr hole procedure were recognized by the student, and the “patient” appropriately sedated and intubated, the model was provided to perform the burr hole (Figure E).

Future Uses and Suggestions
Care needs to be taken as to the number of layers of fiberglass used to create the skull. We found that too many or too few layers created less than realistic conditions for drilling. Three layers of fiberglass seemed to provide adequate rigidity.

There are a few limitations with our model, as we originally developed it. Therefore, we suggest that this model can be modified and improved upon to provide a more realistic task trainer for the burr hole procedure. These modifications result in an even simpler construction of the model. Subsequently, we have found that using a 2-inch by 2-inch, 4-mm, reusable plastic packet filled with ten to 15 mL of artificial blood (Figure F) resulted in more predictable “blood” flow after drilling and avoided leakage as was sometimes seen from the ice-pack segments. We have also found that using a commercially available, stretchable “skull cap” to cover the fiberglass material serves as a good base for a silcone skin which is glued to the skull-cap. The silicone skin pad can be made relatively inexpensively, or purchased, and used as an alternative to the commercial neck skin that was used initially (Figure G).

When implementing the use of a trephine drill in actual clinical practice, there are other options available, as the Galt trephine seems less utilized in current patient care settings. Cranial access kits can be purchased utilizing an internet search. These kits typically consist of a rotary, hand powered drill. They also provide different drill bit sizes, as well as a stopper to control depth of drilling. Cranial access kits may be used by neurosurgeons to place ventriculostomies. At the time of this writing, these kits cost approximately $1,100. Our model should be a good simulation platform for use with cranial access kits, as well as the Galt trephine drill.

Conclusion
Emergency trephination is a low-frequency, high-risk procedure. To our knowledge, there are no inexpensive portable trainers available for this procedure. Our model attempts to address this gap. We believe that with future refinements, the model may serve an important role in the training of emergency physicians and other non-neurosurgeons in the performance of this skill. O

DANIELLE KOWAL is a third-year medical student at Rocky Vista University College of Osteopathic Medicine in Parker, Colo.
DR. ROSS is an emergency physician and faculty member at Rocky Vista University College of Osteopathic Medicine in Parker, Colo. He is an associate professor and director of the rural and wilderness medicine track. He also teaches in the office of simulation in medicine and surgery (SIMS) at Rocky Vista University.

The authors have no financial conflicts of interest to disclose.

References

KCENTRA® (Prothrombin Complex Concentrate [Human]) For Intravenous Use, Lyophilized Powder

Initial U.S. Approval: 2013

BRIEF PRESCRIPTION INFORMATION

These highlights do not include all the information needed to use KCENTRA safely and effectively. See full prescribing information for KCENTRA.

WARNING: ARTERIAL AND VENOUS THROMBOEMBOLIC COMPLICATIONS

Patients being treated with Vitamin K antagonists (VKA) therapy have underlying disease states that predispose them to thromboembolic events. Potential benefits of reversing VKA should be weighed against the potential risks of thromboembolic events, especially in patients with the history of a thromboembolic event. Resumption of anticoagulation should be carefully considered as soon as the risk of thromboembolic events outweighs the risk of acute bleeding.

- Both fatal and non-fatal arterial and venous thromboembolic complications have been reported with KCENTRA in clinical trials and post marketing surveillance. Monitor patients receiving KCENTRA for signs and symptoms of thromboembolic events.
- KCENTRA was not studied in subjects who had a thrombotic or thromboembolic (TE) event within the prior 3 months. KCENTRA may not be suitable in patients with thromboembolic events in the prior 3 months. (5.2)

INDICATIONS AND USAGE

KCENTRA, Prothrombin Complex Concentrate (Human), is a blood coagulation factor replacement product indicated for the urgent reversal of acquired coagulation factor deficiency induced by Vitamin K antagonist (VKA, e.g., warfarin) therapy in adult patients with:
- acute major bleeding or
- need for an urgent surgery/invasive procedure. (1)

DOSEAGE AND ADMINISTRATION

For intravenous use after reconstitution only.

- KCENTRA dosing should be individualized based on the patient’s baseline International Normalized Ratio (INR) value, and body weight. (2.1)
- Administer Vitamin K concurrently to patients receiving KCENTRA to maintain factor levels once the effects of KCENTRA have diminished. (2.1)
- The safety and effectiveness of repeat dosing have not been established and it is not recommended. (2.1)
- Administer reconstituted KCENTRA at a rate of 0.12 mL/kg/min (~3 units/kg/min) at a maximum rate of 8.4 mL/min (~210 units/min). (2.3)

Dosage of KCENTRA

Dose* of KCENTRA (units† of Factor IX) / kg body weight

<table>
<thead>
<tr>
<th>Pre-treatment INR</th>
<th>2 &lt;– 4</th>
<th>4 – 6</th>
<th>&gt; 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum dose†</td>
<td>Not to exceed 2500</td>
<td>Not to exceed 3500</td>
<td>Not to exceed 5000</td>
</tr>
</tbody>
</table>

* Dosing is based on body weight. Dose based on actual potency is stated in the vial, which will vary from 20-30 Factor IX units. After reconstitution, the actual potency for 500 unit vial ranges from 450-620 units/vial. The actual potency for 1000 unit vial ranges from 800-1240 units/vial.
† Units refer to International Units.

CONTRAINDICATIONS

KCENTRA is contraindicated in patients with:
- Known anaphylactic or severe systemic reactions to KCENTRA or any components in KCENTRA including heparin, Factors II, VII, IX, X, Proteins C and S. (3)

ADVERSE REACTIONS

The most common adverse reactions (ARs) (frequency ≥ 2.8%) observed in subjects receiving KCENTRA were headache, nausea/vomiting, hypotension, and anemia. (6)

The most serious ARs were thromboembolic events including stroke, pulmonary embolism, and deep vein thrombosis. (6)

To report SUSPECTED ADVERSE REACTIONS, contact CSL Behring at 1-866-915-6958 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

Revised: July 2020

The Official Voice of Emergency Medicine

OCTOBER 2022

ACEPNOW.COM

The Official Voice of Emergency Medicine
For hemodynamically unstable patients on warfarin

SEVERE GI BLEEDS CALL FOR IMMEDIATE INTERVENTION

Act fast in the face of these unstable vitals*

- PT-INR >2
- Moderate-to-severe bleeding
- Heart rate >100 bpm
- Blood pressure <90/60 mmHg

Choose KCENTRA for urgent warfarin reversal

Learn more about KCENTRA and GI bleeds at KCENTRA.com/case-studies

*Not inclusive of all symptoms of hemodynamic instability.
† In 2 head-to-head trials, KCENTRA demonstrated superiority to plasma in 3 of 4 efficacy endpoints: Superior hemostatic efficacy in the Urgent Surgery/Invasive Procedures trial and equally effective hemostasis efficacy in the Acute Major Bleeding trial. Faster INR reduction (to ≤1.3 at 30 minutes after end of infusion) in both head-to-head trials.
‡ 8 hours for Urgent Surgery/Invasive Procedures trial and 12 hours for Acute Major Bleeding trial. Administer vitamin K concurrently to patients receiving KCENTRA. Vitamin K is administered to maintain vitamin K-dependent clotting factor levels once the effects of KCENTRA have diminished.

Important Safety Information

WARNING: ARTERIAL AND VENOUS THROMBOEMBOLIC COMPLICATIONS

Patients being treated with Vitamin K antagonist therapy have underlying disease states that predispose them to thromboembolic events. Potential benefits of reversing VKA should be weighed against the risk of thromboembolic events, especially in patients with history of such events. Resumption of anticoagulation therapy should be carefully considered once the risk of thromboembolic events outweighs the risk of acute bleeding. Both fatal and nonfatal arterial and venous thromboembolic complications have been reported in clinical trials and postmarketing surveillance. Monitor patients receiving KCENTRA, and inform them of signs and symptoms of thromboembolic events. KCENTRA was not studied in subjects who had a thromboembolic event, myocardial infarction, disseminated intravascular coagulation, cerebral vascular accident, transient ischemic attack, unstable angina pectoris, or severe peripheral vascular disease within the prior 3 months. KCENTRA might not be suitable for patients with thromboembolic events in the prior 3 months.

Indications

KCENTRA is a blood coagulation factor replacement indicated for the urgent reversal of acquired coagulation factor deficiency induced by Vitamin K antagonist (VKA—e.g., warfarin) therapy in adult patients with acute major bleeding or the need for urgent surgery or other invasive procedure. KCENTRA is for intravenous use only.

Important Safety Information

KCENTRA is contraindicated in patients with known anaphylactic or severe systemic reactions to KCENTRA or any of its components (including heparin, Factors II, VII, IX, X, Proteins C and S, Antithrombin III and human albumin). KCENTRA is also contraindicated in patients with disseminated intravascular coagulation. Because KCENTRA contains heparin, it is contraindicated in patients with heparin-induced thrombocytopenia (HIT).

Hypersensitivity reactions to KCENTRA may occur. If patient experiences severe allergic or anaphylactic type reactions, discontinue administration and institute appropriate treatment.

In clinical trials, the most frequent (>2.8%) adverse reactions observed in subjects receiving KCENTRA were headache, nausea/vomiting, hypotension, and anemia. The most serious adverse reactions were thromboembolic events, including stroke, pulmonary embolism and deep vein thrombosis.

KCENTRA is derived from human plasma. The risk of transmission of infectious agents, including viruses and, theoretically, the Creutzfeldt-Jakob disease (CJD) agent and its variant (vCJD), cannot be completely eliminated.

Please see full Important Safety Information on the following page. Please see enclosed full prescribing information, including boxed warning.

To report SUSPECTED ADVERSE REACTIONS, contact the CSL Behring Pharmacovigilance Department at 1-866-915-6958 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

KCENTRA is manufactured by CSL Behring GmbH and distributed by CSL Behring LLC.
KCENTRA® is a registered trademark of CSL Behring GmbH.
Biotherapies for Life® is a registered trademark of CSL Behring LLC.
©2022 CSL Behring LLC 1020 First Avenue, PO Box 61501, King of Prussia, PA 19406-0901 USA
www.CSLBehring.com www.KCENTRA.com KCT-0156-JUL22