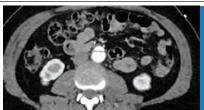
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VISUAL DX Left Elbow Pain Diagnosis? **SEE PAGE 18**

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KIDS KORNER Tachycardia in Children **SEE PAGE 20**

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For more clinical stories and practice trends, plus commentary and opinion pieces, go to: www.acepnow.com

FORENSIC FACTS

Child Abuse Cases in the ED

Violence against children and animal cruelty are linked in a cycle of violence



by RALPH RIVIELLO, MD, FACEP; AND HEATHER ROZZI, MD, FACEP

A 5-year-old male is brought to the emergency department (ED) by his father and stepmother because they noted bruising to the child's cheek after he returned from his biological mother's home. The child has not told his father how the injury occurred. When asked about the bruise in the ED, he points to the plush dog he is holding and says, "My puppy got an owie here."

A 32-year-old woman presents after being assaulted by her husband. Following medical care, she states that she wants to leave him

CONTINUED on page 21

Expanding EPIC-TBI Program Globally

A train-the-trainer initiative for traumatic brain injury management in Vietnam

by SHABANA WALIA MD, MPH, FACEP; THERESA TRAN, MD; BEN BOBROW, MD, FACEP; AND HOÀNG BÙI HẨI, MD, PHD

the bustling streets of Vietnam, motorcycles remain the predominant mode of transportation. Navigating through Hanoi's vibrant traffic, unhelmeted riders and close call accidents are all too common. Despite the implementation of a mandatory helmet law in 2007, road traffic collisions continue to be a significant contributor to traumatic brain injuries (TBI) and are the leading cause of both fatal and nonfatal injuries.1,2 To address this issue, a team of global health professionals endeavored to enhance the management of TBI patients in Vietnam. Their initiative not only aimed to elevate the standard of care for the emergent management of TBI in Vietnam, but also served as a model of excellence for global health interventions worldwide.

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NEWS FROM THE COLLEGE

UPDATES AND ALERTS FROM ACEP

New Unionization Resources Now Available

In a growing curation of content about physician unionization, the ACEP Medical-Legal Committee has published an information paper on the trending topic.

Interest in unionization by ACEP members and non-members picked up steam in early spring when ACEP launched a survey asking if the possibility of emergency physician unionization would be worthy of further discussion. Of 4,804 respondents, nearly half indicated a strong interest in exploring unionization.

In addition to the information paper, there are also online courses from ACEP23, podcasts, articles, and other resources about the issue.

You can also join ACEP's EM Unionization Member Interest Group, which brings together members interested in issues related to the labor challenges faced by practicing emergency clinicians. It also provides a platform for emergency physicians to discuss, advocate for, and implement strategies related to labor rights, working conditions, and fair compensation.

Find all these resources at acep.org/unioni-

Bet on Your Education in Vegas—Register Today!

ACEP24 is all about education—but don't forget the flexibility and fun. Learn more and sign up today at acep.org/acep24.

- Register before Aug. 30 with a 4-day registration and get Virtual ACEP24 free. All the courses will be available for 18 months online—leaving you more time to spend time with peers in Vegas and watch the courses
- Based on your feedback, you do not need to pick your courses in advance. Just register for the conference, and set your days while you are on site-prioritizing courses, events, and meetings that matter most to
- The PEER Challenge Finals will be LIVE at ACEP24. This single-elimination tournament tests clinical knowledge and pits the Top 32 qualifiers against each other. Watch the Round of Eight online, set for 4 p.m. (CST) on Aug. 15, to see who will be headed to the finals.
- The new Connections Hub highlights several networking opportunities—both with vendors showcasing the latest technology for your ED and with your peers to take deeper dives into topics that impact your daily practice.
- Experiential educational courses include Game On and the Escape Room!
- Unwind and connect with colleagues with bites and brews at the Section Hall Crawl.



Recognize Your Section... Deadline July 31

Each year, ACEP's Sections of Membership receive a variety of awards. See if your Section's exceptional efforts will result in accolades at ACEP24 in Las Vegas. The application deadline is July 30. Four categories are available:

Service to Section (2023 Winner: Palliative Medicine Section)

- Based on activities from Aug. 1, 2023 to July 31, 2024
- · Educational offerings and unique projects that provide member value

Service to College (2023 Winner: Emergency Ultrasound Section)

- Based on activities from Aug. 1, 2023 to July 31, 2024
- Assistance to related College committee(s) to meet objectives
- Development of a policy statement, PREP, or white paper
- Assistance to the College in meeting strategic objectives

Promoting Section Membership (2023 Winner: Diversity, Inclusion & Health Equity Section)

• Based on the highest percentage of free resident members enrolled in the Section and overall increase in membership during the previous year (Nov. 1, 2022 to Oct. 31, 2023). Note: Sections receiving "automatic" members will not be eligible for this award.

Outstanding Newsroom Content (2023 Winner: Tactical and Law Enforcement Emergency Medicine Section)

· Based on the number of newsroom articles published during the previous year (Nov. 1, 2022 to Oct. 31, 2023) and the quality of the content.

ACEP-Backed Physician Due **Process Bill Introduced in Congress**

The Physician and Patient Safety Act was formally introduced in Congress in late May. This bill would ensure emergency physicians are afforded due process protections under medical staff bylaws before an employer makes decisions affecting a physician's employment status. Physician due process was one of ACEPs top advocacy priorities during the 2024 Leadership and Advocacy Conference.

ACEP helped develop this bill that would require the Department of Health and Human Services to issue regulations ensuring that any physician granted medical staff privileges at a hospital has a fair hearing and appellate review through appropriate mechanisms before any termination, restriction, or reduction of professional activity.

"Safeguarding the foundational right to due process for emergency physicians guarantees that we can fully advocate for the health and well-being of our patients without fear of retaliation or termination," said ACEP President Aisha Terry, MD, MPH, FACEP. "The Physician and Patient Safety Act will help dismantle the current two-tiered system where within the same hospital, some physicians have due process protections and others, like emergency physicians, do not." +

AND COMMENTS TO

Inside

THE BREAK ROOM



How Not to Miss Posterior Circulation Stroke (April 2024)

We disagree with the recommendation to use the HINTS Exam as the gold standard for detecting posterior stroke from the April article titled, "How not to miss posterior circulation stroke." The usefulness of the HINTS exam is limited to patients who have underlying nystagmus, which represents less than a quarter of patients with posterior stroke. Instead, we advocate for use of the the National Institutes of Health Stroke Scale (NIHSS) combined with a test of skew and a test of gait to screen for stroke in patients presenting with dizziness, vertigo, ataxia, and imbalance.

Problems with HINTS

- 1. The HINTS exam requires underlying nystagmus.2 In the setting of a patient with nystagmus, a normal response to the head impulse test (defined as the subject being able to keep eyes on target) can be sensitive
- 2. Over 75 percent of patients with posterior stroke do not present with nystagmus so the HINTS exam cannot be used.3
- 3. The interrater reliability of the HINTS exam is, at best, moderate, and requires significant training to perform.4,5

NIHSS: An Underrated **Screen for Posterior Stroke**

and your patients.

and the No Surprises Act.

cy physicians and the public.

There is a widespread misconception that NIHSS is insensitive for posterior stroke. In fact, NIHSS is highly sensitive for stroke, because it contains multiple elements that directly test the brainstem, cerebellum, and occipital re-

CEP President Aisha Terry, MD, FACEP,

kicked off the month of June with a series of appearances advocating for you

Dr. Terry was in Washington, D.C., at the

annual House Call the Mall, on June 4. Rep-

resenting ACEP members, she focused on re-

imbursement, Medicare and Medicaid reform,

House about firearm violence. She explained

how ACEP provides a forum and works

through its Council to set priorities on how

best to attack various issues facing emergen-

she spoke at the Coastal Emergency Medicine

Conference, the annual joint conference of

ACEP's North Carolina, South Carolina, and

Georgia chapters. She shared an update on

ACEP efforts related to boarding, violence pre-

vention, corporatization, and consolidation.

can Medical Association's annual meeting of

its House of Delegates in Chicago. ACEP is the

Dr. Terry continued on June 10 at the Ameri-

Then, she was off to South Carolina, where

On June 7, Dr. Terry spoke at the White

gion.6 The sensitivity of detecting a stroke approaches or surpasses that of diffusion weighted MRI in the early phase, and unlike the HINTS exam, it is a useful screen in all patients with posterior stroke symptoms, not just those with nystagmus.6,7,8

18 | VISUAL DX

It is important to remember that the NIHSS was originally developed to quantify all stroke types, not just middle cerebral artery strokes. It is intended to capture as much functional and testable brain volume as possible, and redundant or unreliable elements were removed. Thus, it is applicable to interior circulation as well as posterior circulation strokes by its very

Additionally, the NIHSS is the most commonly used screen for acute stroke and the majority of emergency clinicians know its elements and can perform the NIHSS with a high interrater reliability between emergency clinicians and neurologists.10

What Are the Gaps in the NIHSS?

The lack of balance testing has been noted as the most common reason for posterior strokes with NIHSS of zero. The authors thus recommend adding a test of truncal stability, which can also be tested with gait.11

The NIHSS does not include a test of skew, which can be an important sign of posterior stroke. It is the most easily performable section of the HINTS exam and is applicable even when no nystagmus is present.

Screening at a National Scale: NIHSS Plus Test of Gait Plus Test of Skew

In 2020, we recommended that our clinicians perform NIHSS plus test of gait and test of skew in patients with undifferentiated dizziness, verti-

Resolution 709: Improvements to

Patient Flow in the U.S. Healthcare

ACEP's testimony reinforced current ACEP

overload. This resolution called for AMA to

join stakeholders in ACEP-led activities to

improve patient flow through the health care

efforts on boarding and hospital system

ACEP President Showing Up for EM

System

system.

go, ataxia, and imbalance, as well as any patient suspected of having a posterior stroke. Our mnemonic for this practice change is "dizziNIHSS," which seems to resonate with our clinicians.

On a per patient volume basis from 2018present, malpractice claims for missed posterior stroke presenting as undifferentiated dizziness have decreased by 50 percent (internal data), suggesting the NIHSS plus test of skew plus test of gait is effective in preventing posterior stroke misses and claims.

Summary

We advocate for the use of the NIHSS with a test of skew and test of gait to screen for stroke in patients presenting with dizziness, vertigo, ataxia, imbalance, and other clinical suspicion for posterior circulation stroke. This approach has strong evidence, is well accepted by clinicians, and has cut our predicted malpractice costs by 50 percent.

-John Bedolla, MD, FACEP; Roya Caloia, DO, FACEP; and Amer Aldeen, MD, FACEP +

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Resolution 710: The Regulation of **Private Equity in the Healthcare** Sector

ACEP called on the AMA to create guidelines and advocate for regulations that preserve physician autonomy. ACEP-supported amendments broadened language to cover more entities with corporate control of medical practices.

On June 11, Dr. Terry and ACEP staff met with representatives from The Joint Commission to discuss the adoption of stronger standards for hospitals related to boarding in the emergency department.

Catch her if you can. Her next stop is in Florida for the EMS Eagles conference.

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Location: Charlotte, NC

Social media handles:

X: @CMCEM Instagram: carolinas_em_residency

Year founded: 1976

Number of residents:

14 residents/year; 42 residents total

Program length: 3 years



CMC residents having fun outdoors

What does your program offer that residents can't get anywhere else?

Carolinas Medical Center (CMC) is a large quaternary hospital that is the center hub of one of the nation's largest nonprofit health care systems, Atrium Health. The emergency department (ED) has always been an integral and well-respected component of this very busy system and is afforded all the resources of traditional large academic facilities. While having the distinct honor of being able to provide care for the medically and surgically complex patients that large academic institutions do, CMC has also always been regarded as our county's regional community facility. This allows our learners to experience the diverse educational benefits of a large academic institution, a busy county ED, and a facility dedicated to caring for the local community all under one roof. In addition, our residents become comfortable caring for the vast spectrum of pediatric presentations, from the common to the critical, also within the same facility. The collection of all the pathology within one facility allows residents to become comfortable with managing the care of all critically ill and injured adults and children. CMC does not have many non-emergency medicine fellowships, so when our residents are in the ICUs as 2nd and 3rd years, they are functioning at a similar level to that

of fellows, working in concert with those services' attendings. Being able to have such a profound and thorough educational experience at the same location has numerous benefits, but the most important is that it affords every one of the emergency medicine team to become very close to each other, creating our tightly knit emergency medicine family. This collegiality is also present across the various specialties within the hospital. All the residents in the hospital work well together, contributing to a high level of collaboration across departments. Without a doubt, we have the most collaborative and supportive relationship with our trauma surgery team, something very unique for emergency medicine residency training programs.

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

Since our residents all work so closely with each other and the entire emergency medicine family, it is only natural that they also enjoy spending time together outside of the ED. Charlotte is a wonderful city in a very welcoming region, and our CMC emergency medicine family takes full advantage of all the area has to offer. There are many traditions that our residents enjoy, including a local "cards round" (i.e., the intern on cardiology rotation picks a local brewery, restaurant, or park where everyone can meet at after work), holiday costume parties, dog park parties, and the float trip down the Catawba River at the end/beginning of the academic year. Additionally, there is easy access to professional sporting events and concerts that many take full advantage of. The U.S. National Whitewater Center is also a fantastic playground, filled with numerous activities for the adventurous (and for those who like to watch the adventurous). One of the most appealing aspects of CMC emergency medicine is the completely inclusive approach to both working and playing. For all events, not only are significant others part of the group, but nurses, ED techs, and our pharmacy colleagues are included. The relationships built at CMC go beyond the hospital walls and extend well beyond the final day of residency.

How should potential applicants learn more about your program?

By visiting the following links:

- https://atriumhealth.org/education/graduate-medicaleducation/physician-residencies/emergency-medicine
- https://www.emguidewire.com
- https://www.cmcedmasters.com/about-cmc.html
- https://www.match.emra.org

—Sean M. Fox, MD, FACEP, FAAP **⊕**



Scan the QR Code to access



Problem Drinking Remains a Big Problem

Simple interventions in the emergency department can turn lives around

by GABRIELLA MILLER, MD; GREG JASANI, MD

t's 7 a.m., and before you've even taken the first sips of your morning coffee, you've already received sign out. The last person on your list is the young man resting in a hallway bed recovering from a drunken fight. Thankfully, he has no major injuries and by the time you get around to evaluating him, he's clinically sober and eager to leave. Ideal discharge? Not so fast. If you spend a few extra minutes with him, an interaction that started as a no-brainer discharge turns into a potentially impactful encounter for a patient who clearly has a problem with drinking.

Continue reading by following the QR code link above. +





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Great job! Love the personal stories to drive points home."

Very entertaining and engaging. More importantly, I learned a ton!"

This course was exceptional, between the caliber of presenters to the review content."

I learned so much! Really enjoyed all the presentations!"

Lectures were all impressive and exceptionally worthwhile!"

Overall, you had great topics and professional speakers! Thank you for the colored printed manual."

All of the presentations exceeded my expectations and I was blown away by the effectiveness of this conference."

All of the faculty were excellent."

I greatly appreciated the short lectures. It was nice to know I didn't have to focus on an in-depth topic for hours on end."

This was wonderful and I will be recommending this to my colleagues."





ACEP4U: Elevating Emergency Medicine Research

by DARRIN SCHEID, CAE

in Ho Han, MD, MS, Professor of Emergency Medicine at Vanderbilt University Medical Center, is considered a research expert in the field of emergency and critical care medicine, particularly in the study of sedatives used for critically ill patients.

The Emergency Medicine Foundation (EMF) calls him one of its biggest success stories.

Dr. Han and Co-Principal Investigator Matthew Semler, MD, MS, secured a \$7 million, five-year research funding award last summer from the Patient-Centered Outcomes Research Institute (PCORI) to compare two sedatives used to place breathing tubes in the emergency department or intensive care unit—ketamine and etomidate.

Dr. Han is a recipient of an EMF Pilot Grant Program, and he gives EMF credit for his PCORI grant award. First, he was able to share pilot program data and demonstrate that the research was possible and valuable in his PCORI proposal.

The value of EMF's Pilot Grant Program goes beyond one victory.

That's why EMF has decided to expand it for the upcoming year.

This year marks a notable shift in its funding strategy. Traditionally, EMF funded a single pilot grant of \$50,000 annually. However, recognizing the growing demand and the potential impact of early research, the Foundation has dramatically increased its commitment. Starting from July 1, EMF will fund six pilot grants, each valued at \$100,000.

This substantial investment is aimed at fostering the credibility of researchers, enabling them to secure larger grants from institutions like the National Institutes of Health (NIH).

The EMF Board's decision to enhance funding stems from the highly competitive nature of previous grant applications. By allocating more resources, EMF aims to support a broader spectrum of research projects and early-stage researchers. This strategy not only aids in the development of new research within the field but also assists seasoned researchers exploring new topics.

Pilot Research Grants are intended to provide "starter" or pilot funding for preliminary data to help initiate a successful line of research that will ultimately lead to a more comprehensive project. This grant's goal is to lay the groundwork for a project that will meaningfully impact emergency care research and to fund a variety of research areas, including clinical, basic science, translational, and health policy topics.

EMF encourages application partnerships between research universities and community emergency departments along with the engagement of operational and policy partners. All applications must identify and justify the primary EMF priority to which they are focusing their proposal.

EMF priorities include:

- Value of Emergency Medicine
- Safety/Quality/Prevention of Error
- Emergency Physician Wellness
- Workforce
- Practice of Emergency Medicine
- Health Disparities
- Education Research
- Basic Science

This year, EMF allocated around \$1 million to approximately 20 grantees. The new funding opportunities for 2025 will be released in October 2024.

EMF strategically utilizes these funds to maximize their impact. By focusing on seed funding, EMF ensures that promising researchers can establish themselves and gain the necessary experience and credibility to pursue larger-scale projects.

Research Quick Facts

EMF

- » EMF celebrated a milestone in 2023, reaching \$20 million in funding to more than 300 grant projects since 1972.
- » The ACEP Council is the largest and longest sustaining supporter of EMF, having contributed \$2.7 million over 27 years.
- » Starting July 1, EMF is expected to award \$1.4 million to 21 emergency medicine physician researchers.
- » Previously, EMF has offered one Pilot Research Grant per year at \$50,000. The 2024-25 cycle is expected to fund six pilot grants at \$100,000 each.
- » Named in honor of ACEP's first president, John Wiegenstein, MD, the Wiegenstein Legacy Society recognizes committed individuals and their families who include EMF in their estate plans. Currently, there are more than 100 members.
- » EMF celebrated its 50th anniversary in 2022.

Research Forum

Research Forum abstracts are graded on a scale from 1-6 in several categories, including:

- » Significance
- » Innovation
- » Approach
- » Validity
- » Impact

The 2024 Research Forum received the third-largest submissions in its history. Here's the Top 10.

RANK	YEAR	CITY	SUBMISSIONS
1	2013	Seattle	860
2	2011	San Francisco	859
3	2024	Las Vegas	858
4	2019	Denver	824
5	2018	San Diego	821
6	2012	Denver	816
7	2017	Washington, DC	804
8	2010	Las Vegas	804
9	2020	Virtual	790
10	2022	San Francisco	762

Strategic Collaboration and Responsive Research Funding

Collaboration and strategic planning are at the heart of the Emergency Medicine Foundation's approach.

EMF actively collaborates with ACEP to identify pressing issues and emerging challenges in emergency medicine. For instance, at a recent ACEP Board meeting, EMF presented research outcomes from the past few years and sought feedback on current critical issues. This collaborative effort ensures that EMF's grant priorities align with the immediate and long-term needs of the field.

The COVID-19 pandemic highlighted EMF's responsiveness to urgent research needs. As the pandemic unfolded, there was

an immediate demand for research on its impact on emergency medicine practices and patient care. In response, EMF established three specific COVID-19 research grants, starting in July 2020.

This response underscores the foundation's ability to adapt to emerging health care crises and support relevant research initiatives

EMF's strategy is to remain adaptive and responsive, ensuring that their research funding addresses the most critical needs expressed by ACEP and the broader emergency medicine community. By doing so, it not only advances but enhances the field but also enhance the overall quality patient care in emergency settings

EMF's commitment to collaboration, strategic funding, and responsive research underscores its pivotal role in the continuous improvement and evolution of emergency medicine.

Research Forum Reinvigorated with Record Submissions

You can't miss Research Forum at ACEP24 this fall in Las Vegas, Sept. 29 to Oct. 2.

Really, you can't miss it. Research Forum will not only have higher visibility and access inside the world's largest emergency medicine Exhibit Hall, but it's also the largest event of its kind since 2013 and third largest in the event's history. Research Forum has witnessed a significant surge in submissions, receiving 858 compared to 650 for last year's event in Philadelphia.

Research Forum organizers report that the submissions are diverse, featuring both familiar contributors and new names, showcasing a wide range of innovative research. They plan to accept approximately 450 abstracts, maintaining a process where each submission is evaluated, scored and ranked. This year, the quality of submissions has been exceptional, with higher scoring thresholds compared to previous years, reflecting the increasing caliber of research being conducted in the

Research Forum organizers say the higher profile of this year's event should keep the momentum going in 2025.

New Program for Young Researchers Promotes Innovation

In addition to the traditional research categories, this year's Research Forum has introduced a new program specifically for young researchers. It focuses on quality improvement projects, providing a platform for residents and medical students to share practical solutions and innovative practices.

Unlike traditional research, these projects do not necessarily involve cutting-edge discoveries but rather practical improvements and efficiencies in emergency department operations.

This new category emerged mid-process but has already garnered significant interest. It allows young researchers to present posters that highlight simple yet effective methods to enhance emergency care. Examples include improving intubation times or developing shortcuts for specific treatments.

The goal is to promote knowledge-sharing and practical problem-solving among the next generation of emergency medicine professionals.

This initiative is part of a broader effort to support and nurture young researchers, providing them with opportunities to showcase their work and gain recognition. By focusing on practical improvements, the forum encourages a culture of continuous quality enhancement in emergency medicine. This approach not only benefits the young researchers, but also contributes to the overall improvement of emergency care practices.

: MR. SCHEID is ACEP's Communications Director.

LEADERSHIP SPOTLIGHT WITH **DR. AISHA TERRY**

EP LEADS NEXT GENERATION THROUGH SERVICE

by AISHA T. TERRY, MD, MPH, FACEP

hysician leadership is a priority for ACEP President Aisha T. Terry, MD, MPH, FACEP. She's approaching the issue from all sides. As she builds a programmatic approach within ACEP to identify and cultivate leaders, she is strengthening the "pipeline" and creating opportunities for newer physicians to thrive. In this spotlight. Dr. Terry interviews Team Rubicon International Chief Medical Officer David Callaway, MD, MPA, FACEP.

The Leadership Spotlight highlights examples of emergency physicians using their foundation in emergency medicine to lead, teach, and inspire the next generation. Whether inside the hospital or beyond, the foundation laid by deep experience in the specialty is versatile, unique, and invaluable.

Dr. Terry: One of my priorities for the specialty going forward is to be more intentional about recruiting emergency physicians and leaders, ensuring diversity and bold new ways of thinking along the way. What are your thoughts on emergency physician recruitment and empowerment through leadership?

Dr. Callaway: Emergency physicians are uniquely suited to be leaders. First, we get a lot of practice. On a daily basis, we are placed in situations where we must direct multidisciplinary teams to care for patients, often in high stress situations. Quickly understanding people's strengths, weaknesses, and needs becomes second nature to most of us.

Second, we are action oriented. And this piece is important for ACEP—our members are passionate, committed, and want to get stuff done. Nothing builds resilience like action and progress. Finally, we are on the front lines of nearly every major issue facing our country. So naturally people become vested in trying to find solutions—to homelessness, firearm violence, climate change, human trafficking. ACEP can harness this passion for great things.

Dr. Terry: You have an incredible range of experience. Are there common threads you see woven through your clinical work in Charlotte, N.C., whether it's service with the U.S. Marshals, disaster response with Team Rubicon, counterterrorism operations, or your role leading efforts to combat climate change?

Dr. Callaway: I truly believe that being an emergency physician is one of the greatest jobs in the world, and with it comes an even greater responsibility. I've always been driven toward opportunities to use health care to build bridges and create stability in unstable areas. Whether it's clinical and operational, such as directing COVID response for a large health system, or it's civic minded, like our efforts to ensure safety in voting through an initiative called Healthy Democracy for All. Or when its advocacy informed by science, on topics like climate change and health equity. It all comes back to skills and passions I developed through emergency medicine.

Look, my wife euphemistically says I have a "healthy distaste for the status quo." That is shorthand for being a pain in the butt. But I find crisis response is the ultimate time for innovation—the barriers are down. I'm an optimist; I think that whatever we are doing, we can do it better.

Dr. Terry: Climate change is interesting because there are a fair amount of people who struggle to see it as a physician's priority. Let's talk about some of these big challenges.

Dr. Callaway: I see two existential threats to humanity—artificial intelligence and climate change. We don't have a full grasp



Dr. Callaway(left) says, "Emergency physicians are uniquely suited to be leaders. First, we get a lot of practice."

on how either will impact humanity. But we know they are both complex systems that likely have irreversible tipping points.

Let's talk about climate change. The World Health Organization calls climate change the top public health threat of the 21st century and the World Economic Forum identifies it as contributing to five of the Top 10 socioeconomic threats of the next decade.

Climate change is real. It is here. And it is impacting our patients, our communities, and the foundations of health and health care across the globe. Canadian wildfires triggering increased ED visits for COPD in Milwaukee, patients displaced from worsening hurricanes in my state of North Carolina, and extreme heat exacerbating housing instability because of increased utility bills. This all lands in our waiting rooms and ambulance bays.

Problems like climate change—or AI or firearm violence—are complex systems challenges that are high stakes and often have accelerating decision timelines. These are exactly the kind of challenges that emergency physicians are trained to address.

Dr. Terry: Can you dig into that a bit? What are your thoughts on an emergency medicine informed approach to leadership and problem solving?

Dr. Callaway: I think we are a pretty diverse group of deci-

sion makers, so I hesitate to speak for our entire profession. One framework is John Boyd's "OODA loop" for decision making—Observe, Orient, Decide, and Act. The OODA loop relies on knowledge, experience, and judgement to push you toward decision and action. It is not a single loop. With each decision, you must reorient and move through the process again. But the key is action. And this is where emergency physicians excel. To lead, one must be able to make hard decisions. Leaders get stuff done. This is what we do every day.

Often, other experts don't have the urgency to act that emergency medicine instills. They succumb to "analysis paralysis" or are crippled by perceptions of risk. I think we have a unique advantage—we understand risk, we always make decisions with limited and sometimes inaccurate information, we trust our teams to act, and we recognize that an unexpected outcome does not *de facto* equal failure. Most people don't necessarily think that way.



Dr. Terry is president of the American College of Emergency Physicians.

DAVID CALLAWAY, MD, MPA, FACEP

- **Current position:** Chief of Crisis Operations and Sustainability, Advocate Health, and professor of emergency medicine, Atrium Health in Charlotte, North Carolina. ACEP ambassador to Hashemite Kingdom of Jordan.
- Residency: Harvard Affiliated Emergency Medicine Residency, Boston
- Medical School: Georgetown University School of Medicine, Washington, D.C.
- Additional Notes: Dr. Callaway is an emergency physician who previously supported the U.S.
 Marine Corps and currently serves as Chief Medical Officer for Team Rubicon International. He
 has extensive civilian and military experience in Iraq, Kuwait, Haiti, Jordan, Burma, El Salvador
 and throughout Africa.

His areas of focus include global health security, firearm violence and injury prevention, climate change, and crisis innovation.

Dr. Callaway is one of 60 people selected as a 2024 Presidential Leadership Scholar, a partnership among presidential centers of George W. Bush, George H.W. Bush, Bill Clinton, and Lyndon B. Johnson.



Hospital Subsidy Evolution

An era of decreasing reimbursement and increasing expenses

by JASON ADLER, MD, CEDC, FACEP

mergency medicine faces economic headwinds that threaten the financial viability of independent practices, the budgets of hospital employed physicians, and diminishes the strength of the nation's emergency care safety net. The safety net proved resilient during the COVID-19 pandemic, yet it is now fraying in the aftermath. Administrative burdens, barriers to payment (e.g., the use of inappropriate diagnosis lists in violation of prudent layperson), and termination of private payer contracts in the wake of the *No Surprises Act* has hindered the practice of emergency medicine.

ACEP has been a strong advocate for emergency medicine reimbursement: In 2021, ACEP successfully lobbied for the 99284 work RVUs to increase from 2.60 RVUs in 2020 to 2.74 RVUs in 2021. Subsequently, in 2022 the AMA Relative Update Committee (RUC) proposed to reduce 99284 RVUS, and ACEP successfully advocated against the proposed decrease. The 99284 RVUs have remained stable ever since.

While ACEP has been successful in advocacy efforts to address many key reimbursement issues, the myriad negative financial pressures have significantly impacted emergency physician groups resulting in many groups requiring new (or increased) hospital subsidies.

Declining Reimbursement

Centers for Medicare and Medicaid Services (CMS) has decreased physician reimbursement by nearly 1.7 percent for 2024, on top of the approximately two percent cut in 2023. Several other factors are exacerbating longer term downward reimbursement pressure.

Medicare Headwinds Mounting Due to Budget Neutrality

Whenever anticipated CMS expenditures exceed 20 million dollars, the conversion factor (CF) must be decreased to preserve budget neutrality. Medicare anticipates increased

cost from the outpatient/office codes and the brand-new use of a code for long term complex patients; in order to remain budget neutral, the CF is being continually decreased. The result is that 2024 had the lowest published CF since 1993. According to the American Medical Association, physician payment rates are down 29 percent compared to 2001 after accounting for inflation. In his final address as AMA President, on June 7, 2024, Jesse Ehrenfeld, MD, MPH, stated, "Medicare reform is our top advocacy priority because it's crippling the sustainability of physician practices, threatening patient access care, and choking the pipeline for future physicians."

Commercial Reimbursement and the *No Surprises Act*

Commercial reimbursement rates have been negatively impacted since the implementation of the No Surprises Act on January 1, 2022. The regulatory implementation of the law has been unfavorable to physicians. There have been four successful lawsuits challenging the regulations, and advocacy for fair regulations will continue, however the uncertainty and difficult landscape continues in 2024. Throughout our health care system, physicians depend on higher commercial payments in order to make up for the relatively lower Medicare and Medicaid payments.3 This balance is now being threatened. Out-of-network commercial insurance payments have decreased and there is an associated downward pressure on in-network rates, including payers unilaterally terminating contracts. While most payer negotiations are private, FTI Consulting has been tracking media reports since 2022. In their end-of-year report, FTI notes the following: a 69 percent increase in the number of contracting disputes covered in the media in 2023 compared to 2022, and 44 percent of disputes did not reach an agreement in 2023-24.4 The result has been widespread negative financial variances, including the highly visible bankruptcy examples of both Envision Healthcare, which declared chapter 11 bank-ruptcy, and the sudden collapse of American Physician Partners, which in late July 2023 provided just two weeks termination notice to more than 100 hospitals and subsequently declared chapter 7 bankruptcy.

Hospital Physician Subsidies Are Increasing

In addition to facing difficult reimbursement realities, emergency departments are experiencing staff burnout, and hospitals and group practices are facing a high inflationary environment and increased expenses. The American Medical Association has reported that practice expenses have increased by 46 percent. On the hospital side, widely publicized strikes and unionization have successfully led to increased wages for hospital employees. Revenue cycle management processes have become more difficult due to commercial payers increasingly interfering with smooth payment processes, requesting records, and downcoding or outright denying services, all of which are time consuming and costly. Setting legal precedent, Virginia ACEP, alongside the Medical Society of Virginia (MSV) and the Virginia Hospital and Healthcare Association (VHHA), successfully sued Virginia's Department of Medical Assistance (DMAS) and CMS over diagnosis-based downcodes.5

HCA Healthcare, the nation's largest hospital chain, reported during its October 2023 quarterly earnings call that physician subsidies had increased 20 percent year to date, and that losses in the former HCA-Envision joint venture (Valesco) exceeded \$100 million in the 3rd quarter. Separately, the Universal Health Services hospital system stated during its conference call in October 2023, that physician expenses had increased 35–40 percent during the past year. The combination of decreased professional service revenue, with increased management costs often results in the need for a new or higher subsidy.

Planning for the Future

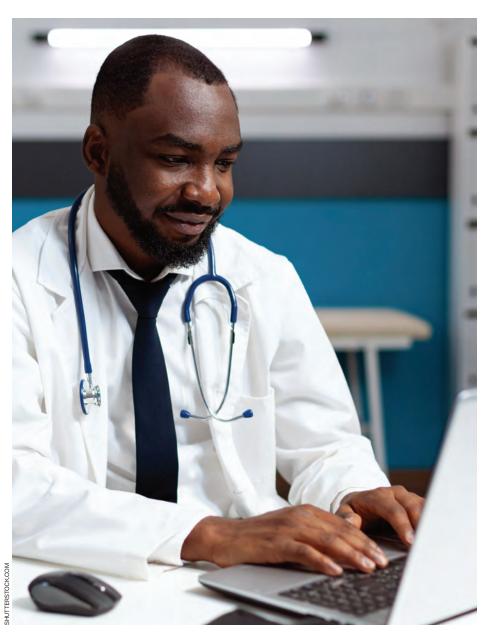
Emergency physician reimbursement is steadily decreasing with no signs of slowing down, and group costs are increasing. Emergency medicine has consistently demonstrated the ability to innovate and adapt. The economic forces and challenges associated with managing revenue and expenses are being faced by both hospital employed and independent groups. In response, budgets and/or subsidies are being significantly adjusted. Expected revenue is being adjusted downward, and staffing metrics, ways to reduce left without being seen, and negotiating sustainable contracts with commercial payers are being carefully evaluated. \bullet



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Coding and

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"Stop the Seize"

The current status of continuous seizure management

by CATHERINE A. MARCO, MD, FACEP; AND RICHARD KOZAK, MD, FACEP

35-year-old man presents by EMS with seizures. According to family at the scene, he has a history of seizures but has not been taking his medication recently. He has been seizing for 30 minutes, despite treatment of intravenous lorazepam by EMS. On arrival, he is obtunded, foaming at the mouth, and exhibiting generalized tonic-clonic seizure activity.

Clinical Question

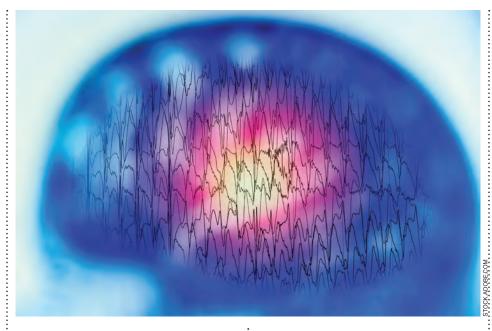
» How should status epilepticus be diagnosed?

The diagnosis and management of status epilepticus are essential skills for emergency physicians. Should emergency physicians rely on standard textbooks for diagnostic and treatment regimens? Or should recent literature guide diagnosis and management?

Status epilepticus has previously been defined as seizure(s) greater than or equal to 30 minutes in which the patient does not regain normal mental status between seizures. Alternatively, the Neurocritical Care Society defines it as a seizure with five minutes or more of continuous clinical or EEG seizure activity, or recurrent seizure activity without recovery between seizures.¹

History and physical examination have been the cornerstone of seizure diagnosis in the emergency department (ED). Historytaking, which relies on patient or witness accounts of the seizure event, can provide critical clues to differentiate seizures from other episodic disorders; however, its sensitivity is limited by the accuracy and completeness of the recollection, which can be affected by the patient's postictal state or the observer's understanding of seizure manifestations. Physical examination, including the assessment of postictal signs such as Todd's paralysis, tongue bite marks, or loss of bladder control, offers additional diagnostic clues but also lacks specificity for seizure diagnosis.

These issues are compounded in the diagnosis of nonconvulsive seizures in critically ill patients. This subset of seizures lacks the dramatic convulsive movements typically associated with seizures, instead manifesting with either subtle clinical signs or altered mental status without any overt seizure-like activity. These seizures are detectable only with EEG monitoring and, similar to convulsive seizures, nonconvulsive seizures that are prolonged or repetitive can present a neurological emergency termed nonconvulsive status epilepticus.² A study of routine EEG in the ED in 2013 found that five percent of ED patients with altered mental status had nonconvulsive seizures (of whom 75 percent were in nonconvulsive status epilepticus).3 A systematic review of nonconvulsive seizures and status epilepticus in the intensive care unit (ICU) reported a pooled prevalence of 15 percent using continuous EEG; however, this prevalence varied considerably according to the clinical context or underlying etiology (eight percent among patients with coma, 10 percent in sepsis, 15 percent in stroke, 23 percent post-cardiac arrest, 33-48 percent following treatment of convulsive status epilepticus).4 With the increasing:



utilization of EEG, especially continuous EEG, nonconvulsive seizures have been increasingly recognized and diagnosed as a cause of altered mental status in critically ill patients.

Although they may not appear as physically injurious as convulsive seizures, nonconvulsive seizures can significantly impact the neurological outcomes and overall prognosis of patients in critical care settings. Especially in the case of status epilepticus, delayed treatment can lead to a phenomenon known as pharmacoresistance, in which the effectiveness of anti-seizure medications diminishes over time due to neurobiological changes that alter drug targets (e.g., reduced surface expression of postsynaptic GABAA receptors) and drug transport mechanisms (e.g., increased expression of drug efflux transporters) to enable self-sustaining ictal rhythms.5,6 This underscores the importance of being vigilant and integrating clinical findings with advanced diagnostic tools like EEG to improve diagnostic accuracy for seizures and refine the management of critically ill patients to ensure comprehensive neurological care.7

Several studies have demonstrated the importance of EEG monitoring in the management of seizures.8-11 Although continuous EEG monitoring would be the gold standard for diagnosing and managing nonconvulsive seizures, it is either unavailable or delayed at many centers, and it is rarely performed in the ED. This is because conventional EEG requires a large machine, a qualified technologist, and a significant amount of time for setup, and the output data must be reviewed and interpreted by a neurologist. Some institutions have the capability to perform real-time EEG monitoring and interpretation by a neurologist in the ED. Other devices have demonstrated potential use as an alternative to traditional EEG monitoring. For example, other modes of EEG monitoring may be used in the operative setting, including bispectral index monitoring (BIS) and SEDline device, to monitor depth of sedation.12 A point-of-care (POC) EEG system has been developed to provide real-time EEG data.13 Preliminary data suggest that among 157 adult patients, POC EEG enabled acquisition of EEG data within 90 minutes of ED arrival, identified epileptiform activity in 36 percent of patients, and impacted treatment decisions.14 Future research is needed to determine the sensitivity and specificity of this device, particularly in the ED environment, where patients may have taken medications or recreational drugs, or may have received sedative or antiepileptic medications.

Diagnostic studies useful in determining the etiology may include POC glucose, serum electrolytes, and complete blood count. Other considerations dependent on the clinical setting and history may include CT scan, MRI, or lumbar puncture.

Management of status epilepticus includes stabilization of airway, breathing, and circulation. If a patient is obtunded or unable to protect the airway, endotracheal intubation is indicated. Following stabilization, pharmacologic therapy should be initiated with first-line therapy of a benzodiazepine, such as lorazepam. Appropriate dosing is associated with seizure termination and reduced complications.15:17 Anti-epileptic medication may be administered concurrently, such as fosphenytoin, phenytoin, levetiracetam, or valproic acid.18-21 Refractory status epilepticus may be treated with a continuous infusion of an antiepileptic medication, such as propofol, ketamine, midazolam, or pentobarbital.

Consultation with neurology should be sought to guide therapy. Patients with status epilepticus require hospital admission, often to an intensive care setting.

Case Conclusion

Following stabilization of airway, breathing, and circulation, antiepileptic therapy is indicated. This patient has already received first-line treatment with a benzodiazepine. Specific antiepileptic therapy should be initiated with another agent, such as fosphenytoin, phenytoin, levetiracetam, or valproic acid. Neurology consultation should be initiated, and the patient should be admitted to the ICU.

Disclaimer

This article is not a comprehensive review of diagnosis and treatment of status epilepticus but an overview of management and future directions. Authoritative sources should be used for diagnostic and treatment decisions.

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STORIES SHAPING THE PRACTICE OF EMERGENCY MEDICINE

CASE REPORT



Clinical Image: Dangerous ATV Accident

by REMY ARNOT, DO; AND WILLIAM DENQ, MD. CAQSM

40-year-old woman with a history of untreated hypertension presented by ambulance after she was thrown from an ATV at unknown speeds and then crushed by the vehicle. The vehicle had no seatbelt or airbags, she was not helmeted, and she did not hit her head or lose consciousness. She reported 10/10 pain localized to her right arm and right flank, with no other complaints. On arrival, she was stable, airway breathing and circulation were intact, and Glasgow Coma Scale was 15. Initial vitals: HR 90, BP 161/142, RR 24, SpO₂ 100 percent on room air, afebrile. Primary survey was remarkable for an obvious deformity to the right forearm. Her secondary survey was remarkable for scattered abrasions and moderate bilateral flank tenderness. Her focused assessment with sonography for trauma was negative with bilateral lung sliding. The patient was neurovascularly intact throughout, with right upper extremity motion limited due to pain. Initial anteroposterior (AP) chest radiograph demonstrated no mediastinal widening, tracheal deviation, or pneumothorax. Plain film scout images of right upper extremity demonstrated a midshaft radius fracture.







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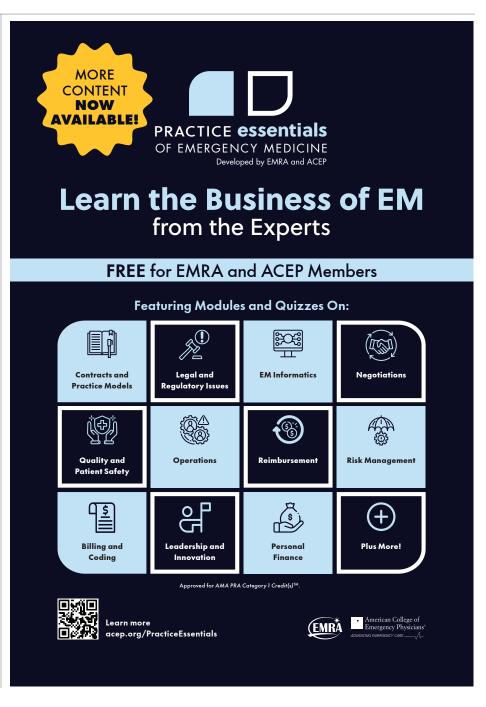
- Christopher S. Kang, MD, FACEP; Immediate Past President



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A NEW SPIN

10 TIPS FOR EMERGENCY

EARN FROM MY MISTAKES

by AMANDA SMITH, MD, MS

I have learned more from my failures than my successes. My current practice is a hybrid of academic and community sites, and I have worked in myriad community hospitals from busy ones to single coverage critical access hospitals. Each has its own challenges and lessons.

Emergency medicine residencies focus heavily on foundational knowledge, procedural competency, and professionalism. But we often learn real life, practical skills during our first years out of residency. I have learned much of this the hard way. Hopefully, they will make your first few years out a little easier.

BE EARLY, BE PREPARED, AND INTRODUCE YOURSELF

For your first few shifts at a new facility, introduce yourself to the nurses, consultants, and ancillary staff. If you are single coverage right off the bat, you need to be familiar with your facility's OB, peds, and difficult airway resuscitation equipment and resources. Ask your charge nurse or medical director to walk you through it. You do not want to be fumbling through the pads or OB equipment during a critical resuscitation.

Arrive early, especially when relieving the overnight physician. Institutional culture varies, but it always goes a long way to relieve your colleagues 15 minutes early.

ATTENDING LIFE CAN BE LONELY. **SO FIND YOUR COMMUNITY**

For those starting a career in a new practice environment, it can be lonely at first while you nurture relationships. Residency sets you up for success from day one, but transitioning into a new job takes courage and time. Give yourself grace.

If you are a new grad, you may not have mentors reach out to you as often as when you were in residency. I felt this my first year out. Now that I mentor residents, I think of my recent grads all the time. I am wishing them well and reminding myself of how I felt in their shoes. However, I do not always check in with them as much as I would like. Reach out to your old mentors. Reach out to your peers, as they are likely facing similar challenges.

When I moved to a new city to start a new job, I thought a support system would form organically (and quickly), similar to residency. I learned that sometimes it takes effort and time to build a community.

THINK BEFORE YOU SEND THAT EMAIL. **BECAUSE TIME BRINGS CLARITY**

I have never regretted waiting to send a heated email. However, I have regretted many angry conversations and emails sent in the emotional flurry of frustration. Maybe you worked an overnight shift with broken equipment and decreased staffing ratios. Before you light up your medical director with a salty email or complain to your colleagues, sleep on it. Time will usually bring clarity to an initial visceral response.

STAY CONFIDENT, BUT HUMBLE

You do not want to brag about your airway or central line skills just to be humbled by a difficult peds airway or angioedema your first shift. Medicine, especially emergency medicine, is a humbling profession. When you do have a challenging angioedema or case, I personally find it helpful to take a couple of breaths. I recently learned the power of fully exhaling instead of the typical "take a deep breath" advice. I now practice this routinely. Remind yourself that you know what to do. You are well prepared for this. Getting anxious will not help. Mind over matter. Lead your room well. Know your contingencies.

If the resuscitation does not go as well as you wanted, learn from it and move on. The past is the past. If you have a difficult outcome, it is helpful to know what risk management support you have at your hospital. Sometimes there is a risk management staff member on call to support you in navigating challenging outcomes, including your immediate documentation.

YOUR MOOD IS

CONTAGIOUS, SO CHECK

IN ON YOUR EMOTIONS

PHYSICIANS

The emergency physician sets the tone for the department. If you are grumpy in the department, everyone else will be. If I am returning to work after vacation or a few days off, my emotional battery is at 100 percent. If I am in the middle of a stretch of shifts, I must be aware that I am likely starting depleted. Add on the daily frustrations we all face during ED shifts: the challenging consultant, high volumes, time intensive laceration, etc. We are all human. If you find yourself drained, notice when it is happening and develop your own ritual or mantra to reset. For me, walking outside the ambulance bay for a few breaths of fresh air or walking to brew a coffee is helpful while I reset. You can spend months fostering a good rapport with your ED staff only to ruin it with a few minutes of anger or a harsh word.



DON'T WASTE SUFFERING

We all make mistakes. You will inevitably miss something. When you do, learn from it. Don't allow yourself to waste that suffering. Learn and move on. You can become a better physician and person from handling failure with grace and a growth mindset.

When I see higher volumes or staff many APP patients, I am more prone to missing small details. My personal practice is that when I find myself seeing higher volumes, I purposely spend a few extra seconds re-reviewing the CBC, BMP, and vitals one last time before discharging.



Remember to have fun! Emergency medicine is what you make of it. Take ownership of your professional identity and who you become over the next 10 years. You have worked hard to enter an honorable career that will challenge you, bring you perspective, and allow you time off and the opportunities to pursue different interests in and outside of medicine. I have never had a boring ED shift or the same shift twice. Stay positive. Enjoy being an attending and physician. Most importantly, be proud of yourself.



FIND YOUR PRACTICE STYLE

I did not staff patients with physician assistants and nurses practitioners during residency, so this was a learning curve for me as a new attending. Working with nurses and physician assistants comes in many flavors. Sometimes you staff all their patients. Sometimes you staff none. Other times you sign all their charts whether you saw the patient or not. I can write an entire paper about the lessons I have learned from staffing NPs and PAs patients and signing their charts. My main lesson is: pay attention to the attestation you are using when signing the physician assistants and nurses practitioners. charts. If something doesn't feel right, be more thorough, see the patient, ask for more information. Your medical license is undersigning the care. But remember, both you and the NPs and PAs both want the best care for the patient.

"A New Spin" is the personal perspective of the author and does not represent an official position of ACEP Now or ACEP.



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GIVE YOURSELF TIME BEFORE YOU FORM AN OPINION ABOUT A NEW JOB

When you start somewhere new, give it a fair chance. Give yourself a year at a new place before deciding to move on. Keep an open mind. Try to learn its culture and norms. Don't be the newbie who constantly refers to "how we did it at my last shop."

IT'S OKAY TO SAY NO

Early on, it is easy get seduced by the dollar amount of an extra shift and pick up so many shifts that you are working more than you were in residency. Instead of thinking of the extra pay, I now look at extra shifts in terms of what I am trading away my time for. Is it worth it to me to miss dinner with my spouse or not spend time on hobbies that rejuvenate me?

One of the hardest lessons I have had to learn is to say no. Consider your bandwidth before agreeing to a new QI project or committee. Will it bring you joy?

By the Numbers

THE COST OF EMERGENCY DEPARTMENT PEDIATRIC READINESS

SAMPLE OF EDs

(EMERGENCY DEPARTMENTS)

983

in 11 STATES



TOTAL ANNUAL HOSPITAL COSTS RANGE

\$77,712

\$279,134

High volume EDs

ANNUAL COST-PER-PATIENT

RANGE

\$3/CHILD High volume EDs



Low volume EDs

readiness costs
0.9%-5%

From equipment and supply costs

Source: Remick KE, Gausche-Hill M, Lin A, et al. The hospital costs of high emergency department pediatric readiness. *J Am Coll Emerg Physicians Open.* 2024;5(3):e13179. Published 2024 Jun 3.

OPINIONS FROM EMERGENCY MEDICINE

ANEW SPIN



A Different Kind of Moral Injury

An iatrogenic trauma leads one doctor to reconsider her career

by CARRIE VARGO, MD

ne night I found myself on the other side of the stretcher, as a patient waiting for a psychiatric assessment in an emergency department (ED). After drinking a couple of beers and texting a friend about my depression and marital issues, my friend was respectfully concerned about me. I had said that sometimes I would rather be dead than feeling this sad, so my friend convinced the police to place me under a mental hygiene arrect

My interview by the male emergency physician was painfully brief, but I was forthright about being from the same specialty, explained in detail the preceding events, and said that I understood that he wanted to rely on a formal psychiatric evaluation before deciding if I was safe to be discharged to home. Being stubborn, however, and nervous about a positive blood alcohol level on my record, I shared my opinion about "medical clearance labs" that we emergency physicians usually order to appease the minds of our psychiatry consultants; we should not have to wait for labs to speak with our mental health consultants.

After he left, and while I waited alone in the room for what felt like forever, I heard my husband and my three-year-old son talking in the waiting room. All I wanted was to talk to my husband and my baby boy and tell them I loved them and that I was okay. I knew it would not be until morning before I was "medically cleared" for my psychiatric evaluation, and I wanted to let them know they could head home. So I popped my head out, and, because there was no one-on-one attendant nearby, I walked out of the room to find my family. Unsurprisingly, several nurses and a sauntering security guard followed me before I could even reach the waiting room door, refusing to let me talk to my husband. After they threatened to have me dragged back by security, I walked back to my room and sat on my bed.

Several minutes later, a group of nurses and a security guard stood next to me. I knew immediately what was about to happen as they all grabbed hold of my limbs, despite my passively lying down without a hint of resistance. I knew there was no use in fighting, but I did plead, though, blabbering about giving in to the blood tests and asking why they were doing this when I had agreed to come back to the room voluntarily. But the begging and tears did not stop them from stabbing me with three intramuscular injections, later confirmed to be the notorious B-52 combo of lorazepam, haloperidol, and diphenhydramine. All

I could do was submit to their power as I lost my freedom to control my body.

From my experience as an emergency physician, I know there are often pressures influencing the decision to chemically restrain patients, one that I have felt guilty for even entertaining, such as lacking staff to spend the time verbally redirecting patients back to their room or situations like the one I experienced recently when a first responder flippantly asked if I would just give a verbally belligerent guy some ketamine and make "everyone's life easier." It should be obvious that using any form of restraints should be a last resort, used only after attempts to deescalate have failed, not just because there are physical risks like extrapyramidal and cardiovascular side effects, but also because restraints limit some fundamental human rights and risk the individual's long-term mental wellbeing. One study found that up to 47 percent of people end up with post-traumatic stress disorder as a result of this traumatizing practice.1

Having now been the victim of this coercive procedure, when it appeared that chemical restraint was used "punitively, for convenience, or as an alternative to reasonable staffing" and without exhausting alternative options, I can now speak from the perspective of the patient on what it feels like to have liberties stripped away, to feel that forced treatment was completely unjustified, to think perhaps it was a means of punishment or an "unnecessary exercise of power," and to feel utterly helpless and vulnerable.2-5 Although carrying a diagnosis of depression caused me fear of being discredited and suffering professional fallout, unlike most mental health patients who have no chance of obtaining justice, as it is their word versus the almighty physician's, I am in a position where I can use my story to promote awareness and change within our medical community.6

When I finally had the courage to request and read through my medical records, I was appalled to learn that it was a second female doctor, one I had never met that night, who had the audacity to write in a note that she was medicating me because I was agitated; she wrote that she was doing it for safety reasons. Perhaps she was receiving sign-out at shift change and made a very inaccurate presumption, but this is only my own speculation; there is no other evidence in the chart of

her having any form of interaction with me. My story is not meant to demonstrate a rare "bad apple" doctor getting away with malpractice but to call attention to a much more likely scenario: Emergency physicians frequently jump to chemical sedation without exhausting other options or contemplating the ethical and moral consequences of this practice. Further, and perhaps more importantly, when we witness any form of practice that we may find questionable or even outright wrong, we may not speak up because we have learned to be silent. The "hidden curriculum" of our training teaches us not to challenge the hierarchy,7,8 Meanwhile, patients are losing trust in our health care system; I am losing trust as well. Every day I think about leaving medicine, even though that would only add to the statistics of burnout and the abysmal attrition rate, especially of women, in our specialty.9 By speaking out, I hope to once again find my calling in medicine. •

DR. VARGO, a loving mother of two beautiful boys, completed medical school in Rochester, N.Y., and her emergency medicine residency in Syracuse, N.Y., and is working full-time as a nights-only emergency physician in community hospitals in western New York.

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"A New Spin" is the personal perspective of the author and does not represent an official position of *ACEP Now* or ACEP.



Physicians from the UT Health Houston Department of Emergency Medicine and Hanoi Medical University collaborated to introduce an EPIC-TBI training course.

EPIC TBI | CONTINUED FROM PAGE 1

Central to this initiative is a comprehensive training protocol, the EPIC (Excellence in Prehospital Injury Care) Traumatic Brain Injury Project, which has demonstrated a significant improvement in TBI outcomes.³ In the United States, the EPIC protocol has effectively promoted evidence-based standards for TBI treatment, emphasizing stabilization for optimized neurological outcomes. The EPIC-TBI training protocol, historically used to train EMS crews, proved to be simple, effective, and adaptable for low-resource settings, making it suitable for international use.

Physicians from the UT Health Houston Department of Emergency Medicine and Hanoi Medical University collaborated to introduce an EPIC-TBI training course tailored for health care workers in the Hanoi region, including nurses, emergency medicine physicians, and trauma surgeons. Through a blend of didactic sessions, hands-on workshops, and simulated and case-based scenarios, participants were equipped to recognize TBI, assess its severity, and initiate timely interventions. To ensure sustainability and broad impact, the UT Health Houston team employed a train-thetrainer model, imparting specialized knowledge and skills to a select group of emergency medicine physicians who then acted as trainers for their peers. Local experts contributed to curriculum adaptation, aligning the training with Vietnam's unique health care landscape and promoting ownership and cultural relevance. Thanks to the China Medical Board (CMB) Foundation, the team secured a global health equity grant for a one-year pilot project for the EPIC-TBI training program.

But was there an impact?

"The project was very important; it changed the way we treat those with traumatic brain injury. The train-the-trainer model was effective because the young instructors were able to learn and subsequently support other instructors," says Dr. Hai, a leading EM physician in Hanoi.

The team successfully achieved its primary objective of sharing a TBI evidence-based resuscitation protocol developed in the United States and adapting it for use in Vietnam. This effort exemplified the transfer of knowledge between a high-income country (HIC) and a low-middle-income country (LMIC) in a flex-







ABOVE: EPIC-TBI training course in action.

TOP LEFT: Students learn valuable lessons in EPIC-TBI.

 $\textbf{BOTTOM LEFT:} \ Collaborating \ together.$

ible, collaborative, and resource-sensitive manner. The health care professionals in Vietnam displayed remarkable resilience and adaptability. Witnessing their commitment to delivering quality care, even under challenging circumstances, was both humbling and inspiring. In a show of pragmatic solidarity between countries, the teams utilized the train-the-trainer and lecture presentation models in the audience's native language, facilitated by collaboration with native experts, rather than delivering content in a foreign language and relying on real-time interpreters. Moreover, working relationships between the UT Health Houston McGovern Medical School, Department of Emergency Medicine, and Hanoi Medical University, lay the foundation for future collaborative efforts.

The ultimate success of this international endeavor—defined as the integration of the adapted EPIC-TBI algorithm into best practice guidelines within Vietnam's trauma systems—hinges on the ability of an international, multicultural team to champion the initiative and to expand training and adaptation at institutional, local, and national levels. While significant

undertakings like establishing a high-quality EMS system, a trauma system, and a shared electronic medical record system will impact the speed and efficiency of this integration in Vietnam, the Houston-based team believes they have created a replicable model for international medical information exchange. The next step is to evaluate the effectiveness of Vietnam's modified EPIC-TBI protocol and training through a pilot project, once again collaborating as an international team of investigators, educators, and clinicians.



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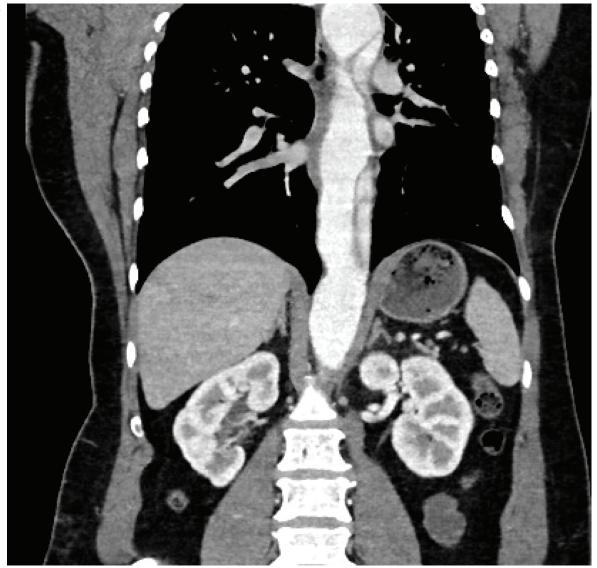
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The CT scan of the chest, abdomen, and pelvis revealed a large traumatic Stanford type B aortic dissection. The patient was immediately started on esmolol and nicardipine drips with a systolic pressure goal of 120 mmHg. She was emergently transferred to a Level 1 trauma center by air ambulance, accepted by trauma surgery, and followed closely by vascular sur-

This case highlights the importance of recognizing concomitant trauma beyond a distracting injury. Traumatic aortic injury (TAI) is the second most common cause of mortality in nonpenetrating traumatic injury; nearly 80 percent of cases die before hospitalization, and, of those who are hospitalized, mortality remains greater than 45 percent, with untreated mortality increasing one percent per hour.3,4 Most individuals suffering TAI are young males injured in motor vehicle accidents or falls.2 Although the most common originating site of a traumatic aortic dissection is distal to the left subclavian artery (LSA), in this case the proximal tear originated immediately upstream from the subclavian and distal to the left carotid artery.2 Plain radiographs of the chest may demonstrate findings of TAImediastinal widening, tracheal displacement, abnormal imprints of the aortic arch—but have low sensitivity and specificity, as reflected by normal findings in this case.2 The gold standard for imaging traumatic aortic injury is contrast-enhanced CT, with trans-esophageal echocardiogram being the second-best option if CT is not immediately available.2 Despite the ready availability of trans-thoracic echocardiogram (TTE) and its ability to capture aortic root dilation, cardiac tamponade, and dilation of the descending aorta and abdominal aorta, the sensitivity and specificity of TTE in traumatic aortic injury remains low and should not be relied on.23 In this case, aortic dissection was visualized neither on initial bedside nor on repeat inpatient TTE, despite operator knowledge of a known lesion and extensive operator training.

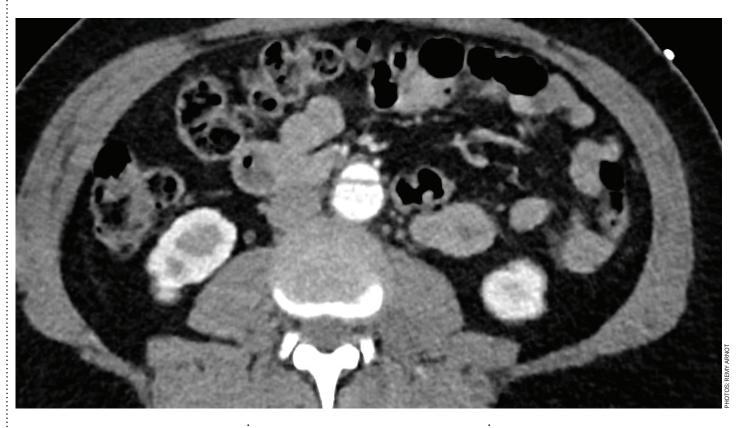
Treatment of the stable patient with TAI begins with blood pressure and heart rate stabilization, with pharmacologic management reducing risk of aortic rupture to less than two percent.3 Esmolol is the preferred medication for stabilization of aortic dissection and aortic aneurysm due to its pharmacokinetics and wide availability. Diltiazem, nicardipine, and nitroprusside should be considered as adjuncts.3 Of note, administration of nitroprussides before beta blockers can propagate aortic dissection due to the reflex catecholaminergic surge secondary to vasodilation, resulting in increased inotropy and downstream shearing forces on the aorta.4 To date, there are few evidence-based criteria for specific blood pressure goals in aortic dissection-ranging : anywhere from 100 mmHg-140 mmHg systolic—although it has been shown that systolic : blood pressure below 70 mmHg increases mortality.4 Meanwhile, guidelines for heart rate are more concrete, supporting optimization below 100 bpm, ideally 50-60 bpm.3,4

The cutoff for necessity of operative intervention beyond medical management is primarily determined by the grade of aortic injury as determined by CT angiography.3 Grade I involves intimal tear, Grade II involves intramural hematoma, Grade III is a pseudoaneurysm, and Grade IV is considered rupture; injuries rated Grade II and above are eligible for op-



LEFT: Image 1, Sanford type B aortic dissection

BELOW: Axial abdominal aortic dissection



erative intervention.3 Morbidity, mortality, and : aged non-operatively until her aortic repair : risk of reintervention are decreased by medically temporizing patients for surgical intervention outside of the high-risk window: 24 hours of onset until two weeks from injury.^{1,3} Temporizing measures are not always possible for critically ill Grade IV patients, and outcomes are usually much worse.3 Fortunately, this case was found to be an uncomplicated Grade III dissection, which was determined to be safe for delayed endografting.

The patient stayed a total of nine days in the hospital and was discharged with a stable aortic dissection planned for future endovascular repair. Her orthopedic injury was man-



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BRIGHTEST MINDS IN EM

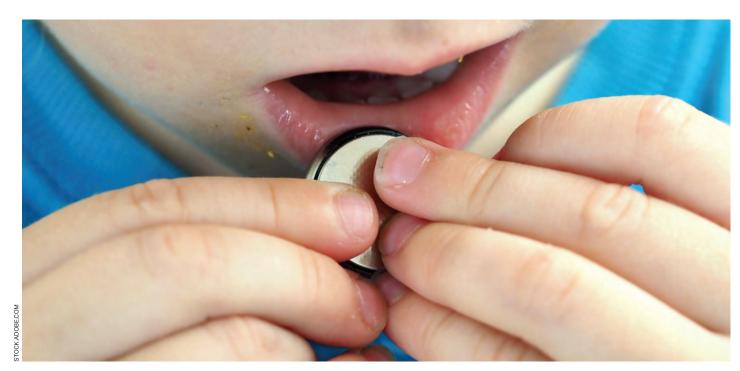
EM CASES



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Button Down the Hatches

Prepare for potentially life-threatening tissue damage with button battery ingestion



by ANTON HELMAN, MD, CCFP(EM),

hy do emergency physicians need to know about the recognition and management of button battery ingestion? Button batteries are ubiquitous in the United States. They have



been used in car keys, flashlights, and children's toys. It can take only two hours for potentially life-threatening tissue damage to develop, and more

than 50 percent of serious outcomes due to button battery ingestion occur after unwitnessed ingestions, when there is often a delay in recognition and management.1,2 Annual button battery ingestions increased

CONTINUED on page 18



by 66.7 percent in the United States from 1999-2019, accompanied by a 10-fold increase in complications.3 The emergency medicine community has a responsibility to educate ourselves, our patients, and the public on this mostly preventable illness.

To understand why button battery ingestion can be rapidly fatal, it is important to realize that the tissue injury these batteries cause results from a caustic chemical reaction that leads to coagulative necrosis, alkaline burns, and liquefaction necrosis. Typically, this occurs in the proximal and mid-esophagus where the battery is impacted, and esophageal perforation may occur, or a fistula into the trachea and/or aorta may ensue, leading to life-threatening bleeding, respiratory failure, and/or sepsis. Three-volt lithium batteries ≥ 20 mm in diameter are most frequently associated with serious complications.4 The rate of necrosis is variable, with perforation typically occurring after 12 hours. Complications may be delayed up to two months, however, making the diagnosis even more challenging.5 Even if the button battery has been removed or expelled from the GI tract, delayed complications are possible, and parents should be counseled to monitor for symptoms of complications.

One of the common pitfalls in the recognition of button battery ingestion cases is assuming that a history of coin ingestion was, in fact, an ingestion of a coin, and not a button battery.6 Parents may mistakenly report a coin ingestion, which typically does not require immediate treatment. A report of coin ingestion should be assumed to be a button battery ingestion until proven otherwise. To differentiate a coin impaction from a button battery impaction, use two radiographic findings: the halo sign, seen on the anteroposterior view as a ring within a ring only with button batteries, and the step-off sign, seen on the lateral view as a 90-degree step at the edge of the button battery that is not present with coin impaction.6 Adding to the diagnostic challenge are the poor specificity and the sometime subtlety of presenting symptoms, which may or may not include wheeze, chest pain, cough, vomiting, hematemesis, shortness of breath, poor feeding, unexplained food refusal, or fever.7

The mainstay of treatment of esophageal battery button impaction is emergency endoscopic removal, ideally within two hours of ingestion.8 Sucralfate or pasteurized honey, 10 mL every 10 minutes, should be given as soon as possible—within 12 hours of ingestion barring any airway concerns.8 Honey should be given no more than six times and sucralfate no more than three times. These coat the battery and reduce pH to delay alkaline burns to the surrounding tissues but should not be considered a replacement for emergency surgical removal. An emergency department (ED) button battery pathway, including who to call for emergency endoscopic removal, transport to a tertiary care center if necessary, and location and dosing of first-line treatments, should be available in all EDs to help facilitate rapid and efficient diagnosis and management.

A controversial area in the management of button battery ingestions is in the asymptomatic patient with a battery discovered distal to the esophagus in the GI tract. Recent expert opinion-based guidelines from the Endoscopy Committee of the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition (NASPGHAN) recommended consideration of urgent endoscopic assessment and removal in patients older than five years or those in whom the battery is > 20 mm in di-

The more we, as emergency physicians, understand about the recognition and management of button battery ingestions, the better equipped we are to educate the public about preventive measures such as counseling families with young children about how to safely use, store, and discard batteries, including taping over battery compartments and recycling used batteries. These are simple measures that can prevent this potentially catastrophic illness.

Many thanks to Dr. Olivia Ostrow for their expert contributions to the EM Cases podcast, which inspired this column.

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O EMERGENCY IMAGE QUIZ

with VISUAL DX



Question: A 68-year-old man presents with a one-month history of left elbow pain. What is the diagnosis?

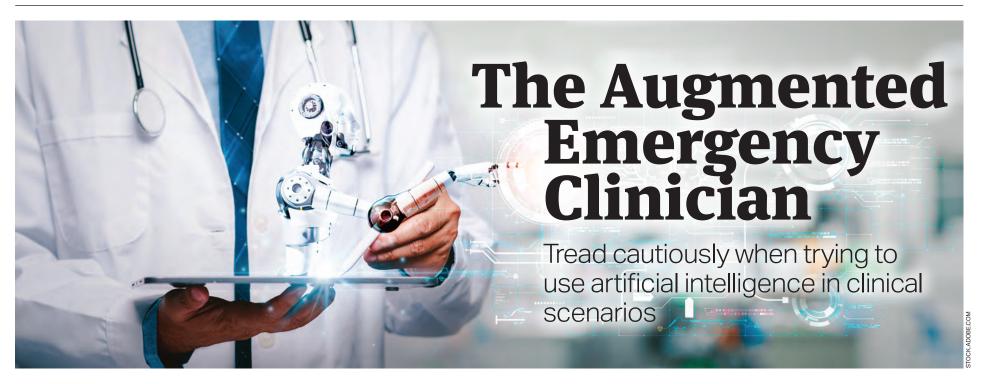
- a. Olecranon bursitis
- b. Septic arthritis
- c. Olecranon fracture
- d. Triceps tendon rupture

ANSWER on page 21

PEARLS FROM THE MEDICAL LITERATURE



DR. RADECKI (@emlitofnote) is an emergency physician and informatician with Christchurch Hospital in Christchurch, New Zealand. He is the Annals of Emergency Medicine podcast co-host and Journal Club editor



by RYAN RADECKI, MD, FACEP

irtually everyone has experimented with large language models (LLMs) in some fashion. Whether a person is conducting such parlor tricks as generating "Choose Your Own Adventure" children's stories, looking for recipes in order to utilize a strange assortment of leftover ingredients, or composing eloquent poetry, the list of non-serious uses is vast. Putting the LLM to work, however, requires a substantial step up from these applications.

Interest in LLMs for tasks beyond the chatbot realm stems from recognition that the underlying machine learning (ML)



structure enables their use as generalizable prediction engines.1 Other, non-transformerbased ML methods can be used on clean, well-structured data sets, but LLMs are frequently capable of feats of unanticipated competence right out of the box. Owing to general availability, most of these studies evalu-

ate the use of ChatGPT (created by OpenAI) as the testbed for processing text extracted from the electronic health record, although experiments from non-English-speaking countries uti-

Recently published experiments with LLMs in the emergency department fall into a handful of primary areas of interest. The first seems to be the use of LLMs as agents for triage and risk stratification. One of these studies evaluated the use of LLMs to return a Canadian Triage and Acuity Scale (CTAS) score.2 In it, authors developed six different prompts based on 61 previously validated clinical vignettes with corresponding CTAS scores. The goal of the varied prompt development was to determine to what extent the prompt format could either improve or diminish the accuracy and reproducibility of the results.

The experiment on CTAS scores was grossly unsuccessful, with an accuracy of less than 50 percent and repeatable variation of 20 percent. This sort of application illustrates where general models are limited by the nature of their basic design and shows that calculations are particularly challenging. In this case, the LLM lacks specific domain training on the CTAS score, and the predictions do not have the appropriate foundational training to operate accurately. These data do not indicate that an LLM cannot be a useful tool at triage, but that the use of general purpose LLMs will not be sufficient.

In a similar vein, another study evaluated the ability of an LLM to assess "clinical acuity" in the emergency department.3 Taking a different approach, this study did not utilize information available at triage, but instead used full-note text from completed documentation of history, examination, and assessment. Rather than being directly applicable to triage, then, this study aimed to test whether an LLM can grossly estimate clinical acuity in general, using the Emergency Severity Index as the "gold standard."

Here, the results tilted more favorably towards LLMs. Given pairs of patients with differing acuity as classified by ESI, the LLM was able to discern the patient of higher acuity approximately 90 percent of the time. This performance was roughly comparable with a corresponding physician reviewer in a subset of clinical notes undergoing manual review. These findings are less applicable to triage and demonstrated that identifying the "sicker" patient is still a leap away from clinical use. However, this nominal success represents the potential for future LLM deployment in this space.

Last, with respect to triage, a rather interesting article from Korea described passive augmentation of the triage process.4 Using fine-tuned versions of Korean language-specific LLMs, this study demonstrated its use as a passive listener to medical conversations. Using text generated from listening to clinical interviews, including both human and automated text-to-speech transcriptions, these authors evaluated the ability of the LLM to identify the top three most clinically important utterances.

Following a fine-tuning process for these models, the authors were able to determine the best specific model, KLUE-RoBERTa, and found moderate similarity between human and LLM rankings of clinical importance. Interestingly, as a next step, both human reviewers and the LLM were prompted to provide an explanation regarding their selections of clinical importance. These explanations were used for a sort of Turing test, in which additional reviewers rated the quality of the explanations. Although humans provided more appropriate explanations, the differences were not particularly profound. As a mechanism for augmenting clinical operations, this approach may show value in passively collecting and feeding information into other systems.

The next area of attempted augmentation lay in summarization tools attempting to assist the over-burdened clinician. These include tools for synthesizing free-text data to assist in risk stratification, such as in a study evaluating the ability to automate HEART (history, ECG, age, risk factors, and troponin) score determination.5 In this study, the authors developed a framework within which to iteratively refine LLM prompts to automate determination of the HEART score. These prompts were tested on batches of synthetic clinical notes for four hypothetical patients. The goal of having several notes available was to test the ability of the LLM to combine multiple sources of data into its calculations.

Unlike the triage calculations, this demonstration was a bit more successful. Most prominently with GPT-4, the iterative prompt design process improved effectiveness, resulting in a mean error in calculating any individual subscore of only 0.10. Ultimately, in their test cases, each hypothetical patient was placed in the correct HEART score risk bin. Although this ap-

pears impressive, these results are not robust enough to generalize them to using GPT-4 in real-world applications, but, rather, they serve as a better example of the necessity of tuning the prompts used to digest clinical data for specific use cases.

Another summarization tool is recently described in a preprint of the use of LLMs to create an ED discharge summary.6 Although many electronic medical records can generate generic discharge paperwork, a concise textual summary of a visit represents a time-consuming burden for clinicians. In this instance, GPT-3.5 and GPT-4 were used, and only one generic "write me a discharge summary" prompt preceded the text of the clinical note. Human reviewers rated each summary on accuracy, presence of AI hallucinations, and omissions of relevant information.

In this simplistic experiment, the authors reported only 10 percent of 100 sample GPT-4 summaries contained inaccuracies, defined as reported facts incongruent with the original clinician note. These results represented the performance high point, however, with 42 percent of summaries exhibiting hallucinations and 47 percent containing clinically important omissions. The examples provided by the authors include all manner of misreported physical findings, confabulated follow-up recommendations, and elements mixed among sections of the clinical note.

As usual, this sample of published literature represents just a snapshot of work in the field. The evolving capabilities of LLMs far outpace the ability of researchers to test and report their performance. Most importantly, these articles demonstrate the need to cut through the hype and perform objective measurement prior to considering real-world use. Individual clinicians ought to use an abundance of caution when experimenting with publicly available LLMs in their own practice.

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Q&A ABOUT OUR LITTLEST PATIENTS

KIDS KORNER



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Tachycardia in Children

Fever, occult diagnoses, and risk for return might get your heart rate up

by LANDON JONES, MD, AND RICHARD M. CANTOR, MD, FAAP, FACEP

its simplest form, the solution for tachycardia in children has been the same since the inception of our specialty—find the source. We routinely recognize the source or have a good suspicion of what that source may be. We find the pieces, put together the puzzle, develop differential diagnoses, and risk stratify the potential outcomes. But sometimes it doesn't all quite make sense. The goal of this discussion is to explore some short topics about pediatric tachycardia for those moments when we think, "Is this kiddo a little too tachycardic?" or "Am I missing something?"

"How much tachycardia can we attribute to fever?"

After taking into account a child's agitation and anxiety when recording a heart rate, is there a particular amount of tachycardia that we can expect relative to each degree of fever?

A 2004 prospective study enrolled 490 children younger than one year of age.1 Rectal temperatures were the gold standard, and children who were fussy or crying were excluded. Other known causes of tachycardia were excluded, such as dehydration warranting IV fluid rehydration, hypoxemia, albuterol within four hours, cardiomyopathy, dysrhythmia, sepsis, known endocrine diseases, and anemia. The authors were investigating the relationship between heart rate and temperature increases of 1°C. The mean temperatures in infants with and without fever were 37.2°C and 38.8°C, respectively. In infants younger than two months of age, there was no association between heart rate and temperature. In infants older than two months, the authors found that the mean increase in pulse rate per 1°C temperature increase was 9.6 beats/min (95 percent CI 7.7-11.5

Another retrospective study of 21,033 children evaluated heart rate via the pulse oximeter and temperature via tympanostomy thermometer. The authors identified a 10.52 bpm/1°C increase broadly across all ages. Although the increase in heart rate (approximately 10 bpm/1°C rise) is consistent with the earlier study and the data set is large, the data analysis and exclusion criteria are very broad, making this a potentially significant limitation of the latter study's results.

Although earlier studies suggest 10 bpm/1°C, more recent studies may suggest otherwise. A recent retrospective study evaluated 61,321 children with temperatures ranging from 36°C to 40.5°C.³ Children were divided into six pre-determined age groups (zero to less than three months, zero to younger than three months, three months to younger than one year, one to younger than two years, two to younger than five years, five to younger than 10 years, and older than or equal to 10 years). In an effort to exclude any additional factors



that may lead to tachycardia, the authors had an extensive exclusion criteria list. Examples included, but were not limited to, any child who required serum labs (including a serum dextrose), children with hypoxia, agitated or crying children, and those with suspected anemia, orthopedic complaints, trauma, environmental factors, overdoses, or acute abdominal complaints that would cause "intense internal pain." The temperatures were all digital axillary readings rather than rectal or oral temperatures that are typically considered gold standards. For all groups except the zero to three-month age group, the biggest increase in heart rate per 1°C was when the temperature was rising from 37 to 38°C and was about 20 bpm. The range of increase was similar among all age groups when rising from 38 to 39°C and was approximately 10-15 bpm/1°C. The range of variation across all groups from 39 to 40°C was wider at three to 10 bpm/1°C. This study would suggest that children's heart rates seemed to increase the most just before spiking a fever at 38°C. The 10 bpm/1°C is similar to the prior studies in the 38 to 39°C temperature range but did not seem to hold true in the 39 to 40°C range. A potential limitation of this study's findings, though, may be the digital axillary temperature readings, which other studies have shown may not be routinely consistent with rectal temperatures.4 A separate 2020 retrospective study found a greater increase in heart rate at 21.5 bpm/1°C in their local subjects and 18.3 bpm/1°C when they an-

alyzed a national database. This latter study's primary goal was to evaluate this same topic in adults, so no exclusion criteria were used, and no summary pediatric data were published.

Conservatively, the best current data suggest an increase in 10 bpm for every 1°C rise in body temperature for fever in children presenting to the ED. Although some studies may suggest larger responses, 10 bpm/1°C is likely the best ballpark number to currently attribute to fever. Although not an ED study, an inpatient pediatric study of 60,863 children found a similar association.⁶

"Are there any places we may need to consider where children can 'hide' disease that may be suggested by tachycardia?"

Although almost any disease can potentially present with tachycardia, two to consider may be pneumonia and myocarditis. In adults, pulmonary embolism (PE) should be considered in cases of persistent or disproportionate tachycardia. Although PE should be considered in children also, it is very uncommon, with a reported rate in the pediatric community of 0.14 to 0.9 cases per 100,000. Anecdotally, pneumonias can sometimes be difficult to diagnose in children. Some lower lobe pneumonias manifest as upper abdominal pain; some simply present as persistent tachycardia. A prospective cohort study of 570 children ages one to 16 years found an odds ratio of 1.3 (95 percent CI; 1.0-1.6) for tachycardia in the setting of a consolidated

pneumonia.⁷ Regarding myocarditis, a separate prospective observational study of 63 cases of pediatric myocarditis found tachycardia (96.8 percent) to be the most common arrhythmia found in these children.⁸ Although these results don't suggest that everyone with tachycardia needs a chest radiograph or cardiac evaluation, they do suggest that pneumonia and myocarditis should be on our differential diagnosis when considering the evaluation of children with tachycardia.

"When discharging a child with tachycardia, does having tachycardia suggest that they will bounce back more easily?"

A 2017 study over 44 months retrospectively reviewed children ages two months to 17 years who were discharged from a pediatric ED.9 The authors specifically looked at those patients who discharged with an abnormal heart rate, respiratory rate, temperature, or oxygen saturation level. The primary goal of this study was to evaluate the frequency and nature of significant adverse events within 72 hours in children who had abnormal vital signs at discharge. During this 44-month time period, the pediatric ED discharged 33,185 children-of whom 5,540 (17 percent) had at least one abnormal vital sign. Abnormal vital signs were defined as temperature ≥ 38°C, oxygen saturation < 95 percent, or heart rate and respiratory rate outside published age-specific ranges. Of the 5,540 children discharged with one or more abnormal vital signs, 24 (0.43 percent) had a significant adverse event within the next 72 hours (defined as re-presentation to hospital and admission for greater than or equal to five days, CPR, endotracheal intubation, or unexpected surgery). Death related to the initial visit, even though it may have happened outside the 72hour window, was explored and included on a case-by-case basis. In the group discharged with at least one abnormal vital sign-compared to the normal vital sign group—the relative risk for a significant adverse event was 2.5 (95 percent CI 1.6-4.2), and the number needed to harm was 380 (95 percent CI 252-767). In the 24 children who were discharged with at least one abnormal vital sign and returned with a significant adverse event, 67 percent demonstrated tachycardia at discharge. In children who were discharged with at least one abnormal vital sign and had no adverse events, 56.1 percent had tachycardia at discharge. Thus, heart rate had poor discrimination for predicting adverse events. There were two deaths in the group with abnormal vitals at discharge; one was an unrelated accidental death and the other was due to infection "not believed to be potentially preventable by hospital observation." In the group with normal vitals at discharge, there were no deaths. Although discharging a child with abnormal vital signs

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but fears for the safety of her two dogs if she is not at home to : protect them.

The correlation between cruelty to animals and family violence has been well established. If one type of violence is present within a family group, then other types of family violence-against children, intimate partners, the elderly, or animals—are also likely to be present. The presence of a pet in the household can serve as both a comfort to victims of abuse and a means of control.

Child abuse: In one study, animal abuse was reported in 88 percent of homes in which physical: abuse and to continue perpetrating the violence. information about these commu-

child abuse occurred.¹ Although a child might be reluctant to disclose that they are being abused, they may confide that their pet is being abused. Any disclosure of animal abuse, whether by the child or by another household member, is a red flag for child abuse and should prompt a report to the appropriate local agencies.

Violence against children and animal cruelty are linked in a cycle of violence; children who witness animal abuse are themselves more likely to become abusers of both humans and animals.2

Pets may be used as a means of control by child abusers. The gift of a pet is sometimes used to gain the trust of a child in order to "groom" them for future sexual abuse. Perpetrators may threaten the safety of pets to keep a child from disclosing

Intimate partner violence:

A history of pet abuse was found to be one of the four most significant risk factors of a person becoming a perpetrator of inti-

mate partner violence (IPV).3 Seventy-five percent of female victims of IPV who have pets report a history of the pet being threatened or harmed by their intimate partner.4 Up to 40 percent of victims of IPV stay in abusive relationships due to fear for the safety of their pets if they leave.5 For this reason, a growing movement espouses the development of shelters for victims of IPV that can also house their pets. Many local animal shelters also provide housing and veterinary care for victims of IPV. Some states have passed legislation permitting pets to be included in protection orders. Local IPV advocacy organizations are an excellent source of

nity resources.

Elder mistreatment:

A similar connection exists between violence against animals and mistreatment of the elderly or other vulnerable adults. The elderly are often

KEY POINTS

- · In homes where animals are being abused, vulnerable humans are at a high risk for abuse. Disclosures of animal cruelty should prompt evaluation for child abuse, IPV, and elder mistreatment.
- Victims of IPV may be reluctant to leave abusive relationships if their pets are at risk. Local IPV advocacy organizations may have resources available.
- Elderly patients may decline needed health care, medications, housing, and other services due to concerns for the welfare of their pets.

strongly attached to their pets, who provide companionship, stress relief, and an incentive for exercise and social interaction. This bond places the elderly person at risk for exploitation. A survey of adult protective services (APS) workers showed that more than 35 percent of clients reported that their pets had been threatened, injured, killed, or denied care by a caregiver.⁶ A perpetrator may use threats against an elderly person's pets to obtain money, housing, or other items from the elderly person. Pets may also be a reason elderly people neglect themselves. Elderly patients may choose to decline health care, services, or safe housing based on concern for their pet's welfare. Elders may prioritize their pet's food and veterinary care over their own. Declining animal welfare may also be a warning sign of self-neglect or an early indicator of dementia.

CASE RESOLUTIONS

Case 1:

You ask the child to tell you about his puppy's injury. He explains that he has a Labrador puppy at his biological mother's house. The puppy urinated on the floor, the mother's boyfriend

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EMERGENCY IMAGE QUIZ | CONTINUED FROM PAGE 18

Answer

The correct answer is a) Olecranon bursi-

The most pathognomonic symptom is swelling in the posterior olecranon (elbow). It can be painless and may or may not have associated erythema or warmth. Pain, erythema, and warmth are much more common in septic compared with aseptic bursitis but can be present in either condition. Fever is associated with septic bursitis. Approximately 80 percent of cases are aseptic (not infected).

Olecranon bursitis can rapidly go from aseptic bursitis to septic bursitis, so reevaluation is recommended after initial diagnosis, especially if risk factors are present, such as uncontrolled diabetes mellitus type 2 or skin disruption.

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FORENSICS | CONTINUED FROM PAGE 21

threw the puppy down the basement stairs, and the puppy has been limping. When asked about how his own bruise happened, the child is tearful and states that his mother's boyfriend also struck him but threatened to kill the puppy if he told anyone.

You contact Child Protective Services. The child is discharged into the care of his father. The local humane officer is contacted, and the puppy is voluntarily surrendered and adopted by the child's father and stepmother.

Case 2:

The victim advocate from the community's IPV organization comes to the ED to speak with the patient. She informs the patient that the local human society has a safe pet program that provides housing, food, and veterinary care for victims of IPV until petfriendly housing can be arranged. The patient elects to be discharged to the women's shelter, and her dogs are transported to the humane society.



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does appear to increase the risk of bounce back, the likelihood of a significant event is still very low (0.43 percent)—emphasizing the importance of good discharge instructions. Although the most common abnormal vital sign in this study was tachycardia, it was a poor predictor of adverse events.

Similarly, another 2017 retrospective article looked at 126,774 children younger than 19 years of age discharged from two pediatric EDs and four urgent care centers.10 Discharge tachycardia was defined as greater than or equal to 99 percent for age and was found in 10,470 (8.3 percent) of the patients. Compared to patients who did not have discharge tachycardia, children with discharge tachycardia had an increased risk of revisit within 72 hours of discharge (adjusted RR 1.3; 95 percent CI 1.2-1.5). Although there was an increased risk of bouncing back within 72 hours, children with discharge tachycardia were not associated with clinically important interventions when they returned (RR 1.0; 95 percent CI 0.9-1.0). Clinically important interventions were defined as supplemental oxygen, respiratory medications and admission, antibiotics and admission, and peripheral IV line placement and admission. One child in the cohort bounced back and required CPR, but this child did not have tachycardia at discharge. Again, this study emphasizes the importance of discharge education and instruction

Pediatric tachycardia can be due to fever or other occult diagnoses, or it may predict an increased risk of return to the ED. •

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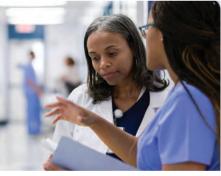
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