

EM Resident

Official Publication of the Emergency Medicine Residents' Association

October | November | December 2023

VOL 50 | ISSUE 4

Bitten! Pediatric Envenomation
in the ED

Management of Severe
Hypothyroidism

The Evolving Field of
Disaster Medicine

Digital Ischemia After Accidental
Epinephrine Injection

NEAR-FATAL ATTRACTION

Neodymium Magnet Ingestion

Factitious Disorder Manifesting
as Acute Tetanus

Editor's Forum: The Importance
of "I" in DEI

EMRA FY23 Annual Report





Student Loan Forgiveness Consultation

Get ready for student loan payments with an expert guide.

The student loan payment pause and interest waiver have ended. Schedule a **free consultation** with our student loan specialists at GradFin¹ to get help navigating the different repayment and forgiveness options.

EMRA Member Benefit

EMRA members get a \$50 discount on a GradFin Membership.²



A GradFin student loan consultation will help you:



Apply for IDR

Understand your income-driven repayment (IDR) and forgiveness options.



Navigate PSLF

See if you qualify and help you stay on track for public service loan forgiveness (PSLF).³



Explore Refinancing

Compare simple refinancing options that could help you save on student loans.

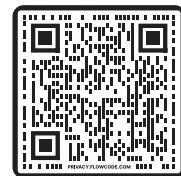


Stay the Course

If you're already in the right repayment program, GradFin helps you stay on track.

Schedule your free 30-min student loan consultation

laurelroad.com/EMRA



All credit products are subject to approval.

IMPORTANT INFORMATION: The U.S. Department of Education recently announced a student loan debt relief plan which includes forgiveness of up to \$10,000 for qualifying federal student loans and up to \$20,000 for qualifying Pell Grant recipients. For more information, please read the announcement. Please note that if you refinance qualifying federal student loans with Laurel Road, you may no longer be eligible for certain benefits or programs and waive your right to future benefits or programs offered on those loans. Examples of benefits or programs you may not receive include, but are not limited to, student loan debt relief or public service loan forgiveness, repayment options such as Income Based Repayment or Pay As You Earn, or COVID-19 relief benefits such as a 0% interest rate, suspension of payments or loan forgiveness. Please carefully consider your options when refinancing federal student loans and consult StudentAid.gov for the most current information.

1. GradFin and Laurel Road are brands of KeyBank N.A.

2. EMRA members get a \$50.00 discount on an annual program membership with GradFin ("Offer"). The discount will be applied on the current annual membership fee of \$249.00 and will automatically apply at checkout. This Offer is only available to current EMRA members, is non-transferable and cannot be applied to previous membership purchase(s). This Offer cannot be redeemed for cash or combined with other offers and is subject to cancellation at any time and without notice.

3. To qualify for PSLF, you must be employed by a U.S. federal, state, local, or tribal government or not-for-profit organization (federal service includes U.S. military service); work full-time for that agency or organization; have Direct Loans (or consolidate other federal student loans into a Direct Loan); repay your loans under an income-driven repayment plan; and make 120 qualifying payments. For full program requirements, visit www.studentaid.gov/manage-loans/forgiveness-cancellation/public-service.

Laurel Road and GradFin are brands of KeyBank N.A. All products offered by KeyBank N.A. © 2023 KeyCorp® All Rights Reserved. Laurel Road is a federally registered service mark of KeyCorp. 3 Corporate Drive, 4th Floor, Shelton, CT 06484, USA.



Thuy Nguyen, MD

Editor-in-Chief,
EM Resident
University of Connecticut

What's in a Name? A Lot, Actually

The substitute teacher is taking attendance. I mentally prepare a firm, but hopefully not impolite, interjection as she gets to the “M” last names. There is a change in the cadence, and I quickly raise my hand.

“It’s Thuy. That’s me, I’m here.”

What follows is typically a sigh of palpable relief, a flustered remark, or an exaggerated attempt. Regardless of the underlying intention, every instance of this has added to and compounded upon my sense of otherness. I recognize the exchange of cultural familiarity for opportunity implicit in my immigration to the United States, but so rarely does recognition equate to reconciliation; thus, at times, the lack of belonging remains pervasive.

I know there are countless physicians, patients, and others who understand what I mean all too well. Because of this, I am writing from a place of solidarity and hope, rather than for lamentation’s sake alone.

As dedicated leaders in diversity, equity, and inclusion continue their tireless work, it is important to highlight how crucial it is that we do not let the

component of inclusion fall behind. It is insufficient to promote diversity and encourage equity; we must also advocate for inclusion if we want our seeds to grow. The acknowledgement of an individual and the celebration of their diversity should start with a wholehearted attempt at correctly pronouncing their name.

If it seems I am creating phenomena from minutia, think about the reactions you get from people you don’t know well when you correctly pronounce their names. Observe how their eyes light up when you unexpectedly address them properly. Think of the semi-familiar patient-care tech, nurse, or off-service resident — sometimes you are rewarded with a “thank you” or pleasant surprise, but regardless of the response, your efforts are always appreciated.

As I work alongside colleagues and take care of patients in the ED, I sometimes think back to those school days when the sheer anticipation of a new teacher encountering my name would bring forth waves of nervousness in me. What I didn’t realize then was this: Perhaps those teachers may have felt the same waves of nervousness as they tried

to figure out how to say my name before actually saying it.

I, Thuy Nguyen, take accountability for any previous prioritization of my own comfort above a person’s identity, and I move forward with the understanding that no name is hard to pronounce — I just have not practiced enough. The truth of this statement is reflected in my impeccable pronunciation of “choledocholithiasis” and “dysdiadochokinesia.”

I hope you will consider doing the same, and I hope you will do this without embarrassment in not getting a pronunciation right the first time, or having to ask for a few clarifications. The beauty of diversity lies in the challenge. When you make a genuine effort, preconceived landmines are, in reality, an opportunity to include others and a slow but persistent dismantling of exclusion. A rose by any other name would smell as sweet, but that should never negate the importance of a name. ★



Thuy

Thuy Nguyen, MD

Email emresidenteditor@emra.org | Instagram [@thuynguyenmd](https://www.instagram.com/thuynguyenmd) | Twitter [@ThuyNguyenMD](https://twitter.com/ThuyNguyenMD)

TABLE OF CONTENTS

- 1** What's in a Name?
A Lot, Actually
EDITOR'S FORUM
- 4** Embracing Challenges,
Championing Change
EMRA FY23
ANNUAL REPORT
- 8** A Cold Case: Management
of Severe Hypothyroidism
ENDOCRINOLOGY
- 10** Pediatric Envenomation
by the Western Pygmy
Rattlesnake
TOXICOLOGY,
PEDIATRIC EM
- 16** The Evolving Field of
Disaster Medicine: A Q&A
With Dr. Gregory Ciottone
DISASTER MEDICINE
- 24** Hand, Meet Autoinjector:
Ouch! Digital Ischemia
to Fifth Digit From IM
Epinephrine
VASCULAR, PEDIATRIC EM
- 28** The Trouble With Plasma
OP-ED
- 30** Managing Left-sided
Tension Pneumothorax With
History of Remote Right
Pneumonectomy
PULMONARY
- 32** Q&A: Emergency Medicine
at a Rural Critical Access
Hospital
CAREER PLANNING
- 38** Donating Eggs in Med
School: A Story of Bodily
Autonomy and Privilege
OP-ED
- 42** Factitious Disorder
Manifesting as Acute
Tetanus
PSYCHIATRY, PATIENT
INTERACTIONS
- 44** Atraumatic, Anterior
Segment Ophthalmologic
Hemorrhage Requiring
Anticoagulation Reversal
OPHTHALMOLOGY
- 46** Early Presentation After
Neodymium Magnet
Ingestion Associated With
Decreased Morbidity
PEDIATRIC EM
- 48** Buprenorphine-Naloxone
Initiation in a New York
City ED
ADDICTION MEDICINE,
PATIENT INTERACTIONS
- 52** Caring for Homeless
Populations in the ED
OP-ED, SOCIAL EM
- 54** Caring for Immigrants
in the ED
OP-ED, SOCIAL EM
- 56** Team-Based Learning for
New AMA Charting and
Coding Guidelines
ADMIN & OPS, HEALTH
CARE ADMINISTRATION
- 65** ECG Challenge
CARDIOLOGY
- 67** News & Notes in
Emergency Medicine
- 69** Board Review Questions
PEERPREP

EDITORIAL STAFF

EDITOR-IN-CHIEF

Thuy Nguyen, MD
University of Connecticut

EDITORS

Matthew E. Apicella, DO
Mount Sinai Medical Center

Richie Cunningham, MD
Stanford Medical Center

Annemarie Daecher, MD
Einstein Healthcare Network

Zackary Funk, MD
University of Florida – Jacksonville

Lucas Goss, MD
Carolinas Medical Center

David A. Leon, MD
Johns Hopkins Medicine

Evan McMurray, MD
Mount Sinai Morningside West

Gabrielle Ransford, MD
East Virginia Medical School

Luke Wohlford, MD, MPH
University of Vermont

MSC EDITOR

Mara Havard
A.T. Still School of Osteopathic Medicine

ECG FACULTY EDITOR

Jeremy Berberian, MD
ChristianaCare

TOXICOLOGY FACULTY EDITOR

David J. Vearrier, MD, MPH, FACMT,
FAACT, FAAEM
University of Mississippi

ORTHOPEDICS/SPORTS MEDICINE FACULTY EDITOR

MAJ John Kiel, DO, MPH, FACEP, CAQ-SM
University of Florida COM – Jacksonville

DESIGNER

Laurel Rummel
Good Clean Design

EM Resident (ISSN 2377-438X) is the quarterly magazine of the Emergency Medicine Residents' Association (EMRA). The opinions herein are those of the authors and not of EMRA or any institutions, organizations, or federal agencies. EMRA encourages readers to inform themselves fully about all issues presented. *EM Resident* reserves the right to edit all material and does not guarantee publication.

© Copyright 2023
Emergency Medicine Residents' Association

Vituity is 100% Physician Owned

All of our physicians are equitable owners that are motivated to experiment, develop, and rapidly deploy solutions to today's biggest healthcare challenges. They are empowered to make decisions that are best for their patients and communities.

We exist to improve lives, not create profits for shareholders.

Find out why a physician owned partnership makes sense for you. Learn more at [vituity.com/careers/physicians](https://www.vituity.com/careers/physicians)



Embracing Challenges Championing Change

Emergency Medicine Residents' Association
Annual Report FY23



A message from **Jessica Adkins Murphy, MD** *EMRA President*

Walking into my emergency department in one of my last weeks of residency, my heart was pounding. My home away from home suddenly felt foreign to me: I was there not as a resident, certainly not as EMRA president, but as a patient. Like so many patients I had cared for over the previous three years, I sat in a hospital bed, my husband at my side, afraid I was miscarrying my early pregnancy. My co-resident took my hand in hers, said, "I'm sorry," and confirmed the ultrasound showed what we feared. I was devastated.

Amid waves of grief, unhelpful thoughts intruded. Something felt twisted about the fact that this was happening to me, not only because we physicians seem to think we're invulnerable, but also because I had spent the past two years writing miscarriage bereavement leave policies for EMRA and the AMA. An illogical part of me blamed that work for bringing this outcome upon my pregnancy. But maybe because of that policy work, maybe because of my supportive residency program's culture, and probably because of generations of female physicians before me, I felt empowered to request a few days off from residency to recover emotionally. Many women, especially in medicine, still do not have this option.

The experience of being human in medicine is not one that's inherently fair or compassionate. To me, advocacy has always seemed like the best way to make the unfair, ungovernable moments of life a bit more controllable. As young physicians who've inherited the harsh culture of medical training, a

profit-driven health care system, and doom-and-gloom online discourse, it's empowering to bring some compassion to the system through policy-making and solutions. And challenging the elements that don't seem fair has been my driving force as EMRA president.

This year, we've advocated for stronger residency standards to ensure the quality of our training remains high as programs grow. We've provided education on resident unionization to educate residents on collective bargaining as a strategy to improve their working conditions, wages, and resources. We supported EM-bound medical students by revamping student resources like our Student Advising Guide and providing free EMRA membership to students under-represented in medicine selected to the ABEM Haley Academy. And we passed new EMRA policies to support our patients, including policies on firearm restrictions in EDs, opioid harm reduction, rural medicine, racial equity, and more.

As I conclude my year as EMRA president, I'm overwhelmed with gratitude to each and every one of you for trusting me to represent your voice. It has been an immense honor to lead this organization of 20,400 remarkable residents, fellows, medical students, and alumni, and I'm thrilled to witness all we will accomplish together in the years to come. Here's to EMRA, and building a future of compassion, justice, and excellence in emergency medicine.

Jessica Adkins Murphy



Advocacy

> \$3.1M annually invested into members

This year EM faced an **unprecedented Match cycle** in which more than 500 residency spots went unfilled prior to the SOAP. Knowing this phenomenon was likely due to the rapid growth of EM residency programs, the ranking practices of programs, and a decrease in applicants to EM, we reached out to our members. In a town hall at our 2023 spring meeting of the EMRA Representative Council, we heard your concerns about profit motives in residency program growth, quality of training amid rapid growth, and whether

future job markets would be able to sustain the exploding workforce.

In response, we released **EMRA's statement on the 2023 EM Match** outlining strategies that residents, program directors, students, and organizations can employ to keep our specialty strong. We advocated directly to the ACGME to fortify EM residency requirements through evidence-based increases in procedure numbers and training experiences. And we amplified your voices through national news media, podcasts, social media, and more.

We've strengthened our approach to advocacy all around. This year, EMRA leaders have provided educational content on **unionization** including panels of resident organizers, EMRA*Cast episodes, and Instagram Live discussions. We addressed **ED boarding** and its impact on patients, physicians, and training in our first annual **Advocacy Week**. Live-streamed discussions on these topics and more are posted on our Instagram @emresidents, where we've been exploring new ways to connect with you, our members.

12

Resolutions proposed and debated by EMRA members and the Representative Council

- » Firearms in emergency departments
- » Opioid harm reduction
- » Position on excited delirium
- » Funding for rural emergency medicine
- » Improving overall wellness among emergency medicine residents
- » Racially equitable language and media in medical education
- » Supporting populations experiencing homelessness
- » Mitigation of competition for procedures between EM resident physicians
- » Reproductive rights and emergency contraception
- » Expanding resident experience to rural and critical access hospitals
- » Improving care for patients who are incarcerated
- » Standardizing away rotation applications

Protecting our training

EMRA is dedicated to ensuring residents receive high-quality training and do not compete with PAs and NPs for procedures in the ED.

In every room where a decision affecting EM physicians-in-training is being made, the EMRA voice is sought out, respected, and heard loud and clear. In 2023, EMRA advocated on your behalf:

- » At ACEP Council, where EMRA brought forward a resolution on protecting residents' choice of three-year and four-year programs, and a resolution on prioritizing residents (over non-physician trainees) when delegating procedures in EDs.
- » At the ACEP Leadership and Advocacy Conference in Washington, D.C., where EMRA residents and students joined ACEP to meet with legislators on Capitol Hill.
- » At the ACGME Emergency Medicine Stakeholder Summit on residency program standards.
- » At the Council of Residency Directors in Emergency Medicine Academic Assembly.

- » On the All EM Organizations' Diversity, Equity, and Inclusion Task Force.
- » On the Coalition on Psychiatric Emergencies.

EMRA released our own statement on the 2023 EM Match and the following statements with our partner organizations:

- » Joint Statement from Emergency Medicine Organizations on Efforts to Diversify Health Care Professionals in the United States
- » Response to Improving Income-Driven Repayment for the William D. Ford Federal Direct Loan Program
- » Easy Bystander AED Use, a tutorial video from EMRA and ACEP
- » Multi-Organizational Letter Regarding AHRQ Report on Diagnostic Errors in the Emergency Department

EMRA also personally reached out to residents displaced by program closures and to residents at EDs affiliated with Envision and American Physician Partners after these corporations restructured and closed in 2023.

12+ Partnerships
Advanced Analgesia in the Emergency Department, AEROS, ACEP, ALiEM, AMA, Coalition on Psychiatric Emergencies, EDPMA, EMF, EMPI, NEMPAC, CORD, Essentials of EM, PolicyRx, and others.

Education

Membership **20,400** >**95%** of EM residents are EMRA members

Our EMRA/ACEP **new member kits** that welcome students, residents, fellows, and alumni to each new EMRA family category, have gotten an upgrade. For years, the kits have equipped trainees to excel on-shift, exemplifying EMRA's dedication to directly supporting our 20,400 members in your daily lives. Now, in addition to our most popular printed guides like EMRA Antibiotic Guide, PressorDex, and more, we are proud to announce the first edition of the **EMRA and AAED Nerve Blocks and Procedural Pain Management Guide**. This new guide, created in partnership with Advanced Analgesia in the Emergency Department, focuses on

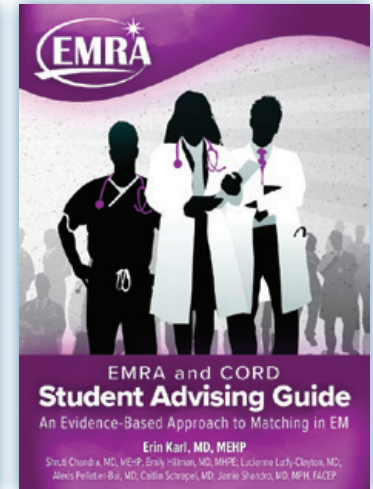
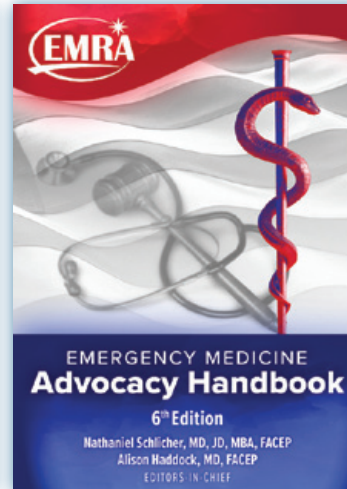
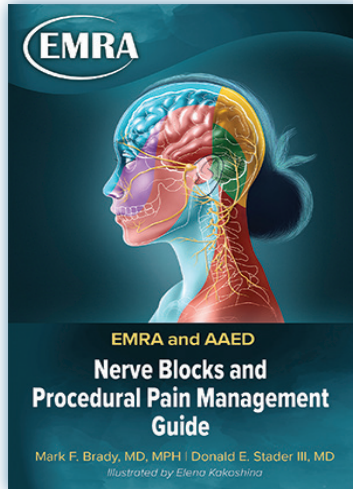
procedural analgesia and dovetails with the already-established EMRA Pain Management Guide to offer thorough alternatives to opioids for pain control.

EM Resident continues to produce stellar content and we just couldn't be prouder. **"Plus One: Care of the Pregnant Trauma Patient"** is being used by a maternal-fetal medicine specialist at Emory University to develop guidelines for EMS management of pregnant trauma patients. In addition, we took steps to highlight our digital content and lessened our environmental impact by transitioning our printed issues from bimonthly to quarterly publication.

EMRA's growing member benefits make the best educational products more accessible to residents than ever before. In addition to EMRA members' free access to EM:RAP, and discounts for Hippo EM, PEERprep, and Rosh Review, we recently secured member discounts for the **EMCrit Podcast**. Furthermore, recognizing the stress that residents and medical students face, EMRA is now exploring wellness-focused benefits. Through a pilot partnership with the app **Headspace**, 300 EMRA members have accessed guided meditation sessions in the past year. We plan to roll out even more new benefits in the months ahead.

36
On-shift guides and original EMRA resources

4 New or newly-revised EMRA guides, references, and apps in 2023



5,000+
Downloads per month

4

Student focused national Hangouts sessions

60,000+ Average monthly online views
>210,000 Searches of EMRA Match for:

24 New episodes per year

18,000 Print distribution

- Residents
- Clerkships
- Fellowships
- Jobs



Leadership

245 programs with 100% membership



EMRA is a launchpad to career-long leadership, and we equip residents and medical students with the opportunities and preparation necessary to shape the future of the specialty.

EMRA committees engage 5,342 of our members in meaningful opportunities to lead and learn. This year, our Education Committee engaged hundreds of residents in Quiz Show, a simulation and trivia competition during the EMRA spring meeting in Las Vegas. The Critical Care Committee joined forces with the Government Services Committee to share fascinating experiences in military medicine in Afghanistan. The Health Policy Committee was instrumental in planning and executing the Health Policy Primer at the Leadership and Advocacy Conference in Washington, D.C. And at ACEP Scientific Assembly, the annual adventure race MedWAR challenged attendees' physical capabilities and medical skills in a heated competition led by the Wilderness Committee.

EMRA's partnership with ACEP unlocks unique leadership opportunities and mentorship that can skyrocket a resident

or medical student's career. More than 60 resident liaisons represented EMRA to ACEP committees, sections, and task forces. The EMRA and ACEP Leadership Academy professional development program graduated 11 Leadership Academy Fellows in 2023. These fellows completed a year-long curriculum followed by a capstone project.

This year, EMRA found new ways to support diverse leaders in EM by engaging students who are under-represented in medicine. We provided complimentary EMRA memberships to medical student scholars of the American Board of Emergency Medicine Dr. Leon L. Haley, Jr., Bridge to the Future of Emergency Medicine Academy. Scholars will have full access to member benefits including our New Member Kit on-shift guides, EMRA committees, and leadership opportunities for the duration of their medical school journey.

These are just a few of the initiatives that EMRA leaders have undertaken to advance our specialty, support fellow trainees, and propel their careers through leadership.

20 Committees

285+ Meetings, webinars, publications

5,342 Members of EMRA's Committees

- Medical students
- Residents
- Fellows

140 Funded national leadership opportunities for members

EMRA and ACEP Leadership Academy
135 Leadership Academy fellows

101 graduates and 34 currently in the program

32 Categories of awards, scholarships, and grants

- Scholarships
- Leaderships roles
- Professional excellence

The Emergency Medicine Residents' Association

is proud to remain the voice of emergency medicine physicians-in-training and the future of our specialty.





A COLD CASE: Management of Severe Hypothyroidism

Timothy Cofer, DO

Resident, PGY-1
Emergency Medicine Program
Einstein Montgomery Medical Center

Seth Merker, MD

Faculty
Emergency Medicine Program
Einstein Montgomery Medical Center

CASE INTRODUCTION

A 76-year-old female presented to the ED via EMS after a friend found her at home with a decreased level of consciousness and dyspnea. She was discovered by EMS to be markedly hypoxic, bradycardic, hypotensive, and hypothermic. She was discharged from another hospital approximately one month prior for management of a small subarachnoid hemorrhage. During her workup, her TSH was found to be 70.2 mIU/mL.

PATHOPHYSIOLOGY AND CAUSES

In healthy humans, the hypothalamus produces thyrotropin-releasing hormone (TRH), which stimulates the anterior pituitary to release thyroid-stimulating hormone (TSH). This hormone subsequently stimulates the thyroid gland to produce thyroxine in

its two forms: T₄ and T₃. The receptors for thyroxine are found in almost every cell in the body and enable it to regulate homeostasis.

When this system is disrupted through certain pathological conditions, the ability for the body to maintain homeostasis is impaired. An insult to this regulatory system that results in a deficiency of thyroxine is called hypothyroidism, while an excess is called hyperthyroidism. Either condition results in cardiac, neurological, respiratory, gastrointestinal, hematologic, renal, and electrolyte abnormalities.¹

In this case, we will discuss hypothyroidism. In short, hypothyroidism slows down metabolism in the human body and impairs its ability to respond to adverse conditions that would normally require the body

to compensate in order to maintain homeostasis.

CLINICAL PRESENTATION AND DIAGNOSIS

Severe hypothyroidism is commonly referred to as “myxedema coma.” However, patients with this condition are often not comatose and do not have edema. Rather, they are most notably recognized by declining mental status along with findings of an inciting event that led to dysregulation.¹ Inciting events can be anything from infection, drug effects, ischemia, metabolic abnormalities, hypoxia, cold exposure, or even forgetting to take prescribed supplemental thyroxine.

Consequently, recognizing common manifestations of severe hypothyroidism is key to forming the differential diagnosis.

Cardiac manifestations are most easily seen on an electrocardiogram (ECG). Some common findings include: bradycardia, flattened T-waves, bundle branch blocks, and complete heart block.

Neurologically, the most common finding is an altered mental status.

Respiratory symptoms include hypoxia and hypercapnia, which can be a result of decreased respiratory drive.

Gastrointestinal symptoms are vague, but include nausea, vomiting, abdominal pain, constipation, ileus, ascites, and even anasarca.

Renal function is decreased, and hyponatremia is a common electrolyte abnormality.

Lastly, hematologic manifestations include an increased risk for bleeding due to an acquired deficiency of many clotting factors.²

It can be difficult to recognize all of these symptoms together when a patient presents to the emergency room, as there are often multiple pathological processes present at the time of diagnosis. However, the typical patient profile is as follows: female, elderly, known hypothyroidism or status post-thyroidectomy, hypothermic, altered mentation, refractory hypotension, hypoxia with hypercapnia, bradycardia, edema, acute precipitating illness, drug toxicity, and hyponatremia.² Essentially, a patient will be slow, cold, and in extreme distress.

The diagnosis of severe hypothyroidism can be achieved with a single TSH along with a free T₄ (FT₄). In primary hypothyroidism, TSH will be increased and FT₄ will be

decreased. Central hypothyroidism will have a decreased or normal TSH with a decreased FT₄.

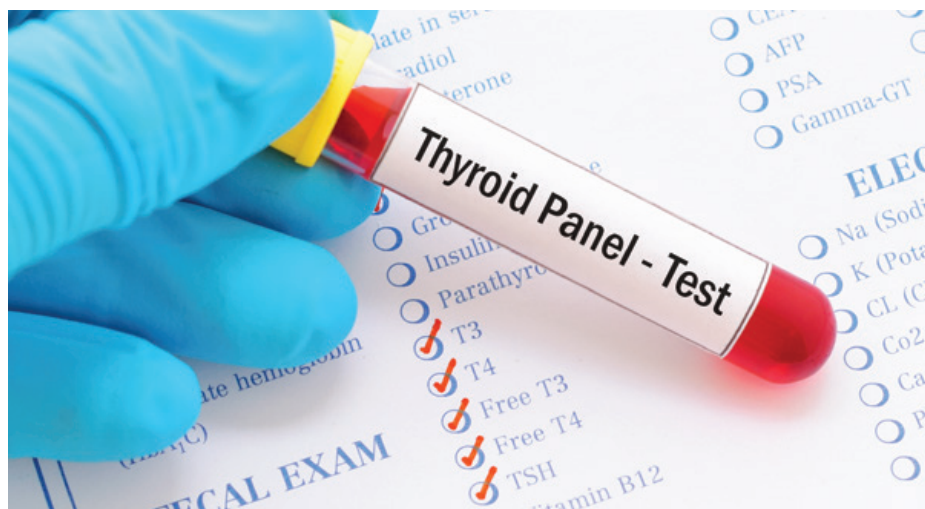
Regardless of the cause, severe hypothyroidism has a high mortality risk (29 percent), so identification and prompt treatment is of paramount importance in the critically ill patient.³

TREATMENT

- Treat any underlying issue or inciting event.
- Rapid replacement of thyroxine; initial IV load of 200-400mcg.
- Empiric stress-dose steroids are recommended. A single dose of 100mg IV hydrocortisone is appropriate.
- Hypotension may respond to crystalloid, but pressors may be required.
- Passive or active rewarming.
- Treat any hyponatremia with use of hypertonic saline only with severe cases of altered mental status or seizures.

CASE CONCLUSION

Initially, the differential diagnosis in this case was broad. Treatment was empiric as an underlying inciting event was suspected for the patient's presentation. Atropine, calcium chloride, and glucagon were administered. A dopamine infusion was started, and broad-spectrum antibiotics were initiated. As time passed, the patient's respiratory distress worsened, and she was intubated utilizing ketamine and rocuronium. However, as laboratory tests began to result and additional history was obtained on family arrival, the diagnosis of severe hypothyroidism became a likely possibility. According to the patient's family, the patient had unintentionally missed over one month of her supplemental levothyroxine. Thus in addition to the initial resuscitation, stress-dose steroids and IV levothyroxine were administered, and the patient was admitted to the intensive care unit for further management and care. ★



CLINICAL PEARLS

- Patients can present with unstable vitals, including hypothermia, hypotension, bradycardia, hypoxia, and bradypnea.
- Patients with severe hypothyroidism do not always have edema and are not always comatose, as implied by the term "myxedema coma."
- If you suspect severe hypothyroidism, obtain a TSH with free T₄; these are relatively quick and diagnostic.
- Critical steps include a bolus of IV levothyroxine, 200-400mcg, and a stress-dose steroid bolus of hydrocortisone 100mg IV.
- Electrocardiogram changes are nonspecific, but sinus bradycardia and nonspecific ST-segment changes are common.
- Treat any underlying condition, as this was likely the inciting event that preceded the patient's presentation and led to decompensation.



The Teeny Tiny Mighty: A Case of Pediatric Envenomation by the Western Pygmy Rattlesnake

Western pygmy rattlesnake envenomations are a rare occurrence but should not be underestimated, as they cause significant morbidity. FabAV, also known as CroFab® (generic: crotalidae polyvalent immune fab ovine), has cross-reactivity with a number of species, but there is no well-documented evidence of venom neutralization for western pygmy rattlesnake envenomation. Our case highlights a moderate western pygmy rattlesnake envenomation in a pediatric patient — with the development of pain and swelling to a limb — that was responsive to FabAV.

Mounir Contreras, MD

Resident, PGY1
Department of Emergency Medicine
University of Texas Southwestern

Daniel Rivera, MD

Medical Toxicology Fellow, PGY5
Emergency Medicine
University of Texas Southwestern

Sing-Yi Feng, MD, FACMT

Associate Professor
Dept. of Pediatric Emergency Medicine and
Medical Toxicology
University of Texas Southwestern

INTRODUCTION

Pit vipers, known collectively as crotalids,¹ are a group of venomous snakes including copperheads, cottonmouths (water moccasins), and rattlesnakes. In the United States,

the smallest of the rattlesnakes is the “pygmy” group. Despite their small size, their venom is a potent hemotoxic that can result in significant morbidity.

CroFab® (generic: crotalidae polyvalent immune fab ovine), also known as FabAV, is frequently used for pit viper envenomations.⁹ FabAV is derived from the venom of four different North American snakes and has cross-reactivity with a number of species, but there is no well-documented evidence of venom neutralization for the western pygmy rattlesnake.⁹

We present the case of a moderate pediatric envenomation with a western pygmy rattlesnake resulting in progressive bruising and swelling, successfully treated early with FabAV.

CASE

A 7-year-old boy with no past medical history sustained a snakebite of the left foot. He was initially taken to a rural emergency department and was transported by air from there to our satellite hospital. While at the satellite hospital, the patient was nauseous and had swelling and severe pain of the affected extremity. The satellite hospital contacted poison control for consultation with the toxicologist, who recommended antivenom, pain control, and transfer to the main campus.

BACKGROUND

Western pygmy rattlesnakes (*Sistrurus miliarius streckeri*) are native to the southeastern United States. They are small even when fully grown,

reaching just under 2 feet.² They inhabit flatwoods, mixed forests, lakes, and marshes across Mississippi, Louisiana, East Texas, extending north into southeastern Oklahoma, Arkansas, Missouri, and southwestern Tennessee.^{2,3}

It is estimated that about 9,000 people per year suffer a snakebite in the United States, but only five deaths occur annually.⁶ The vast majority of snakebites in the United States are from pit vipers, of which more than 50 percent occur from rattlesnakes.⁶ Approximately 25 percent of all pit viper bites in the United States do not result in envenomation and are said to be “dry” bites, or bites that do not contain venom.^{4,6} In particular, western pygmy rattlesnake envenomations are a rare occurrence, likely due to the secluded nature of the species.³

Crotalid venom consists of a complex mixture of proteins and enzymes that causes local tissue destruction as well as hematologic and systemic effects.^{1,6} There are more than 50 constituents of crotalid venom, including:

- disintegrins, whose role is to antagonize fibrinogen activation of glycoprotein IIb/IIIa, which effectively inhibits platelet aggregation;
- eptifibate, a known antiplatelet;
- phospholipase A2, which is thought to damage platelet membranes, causing destruction and resulting in thrombocytopenia;
- metalloproteases, which result in local tissue destruction and increase permeability as well as hemorrhage;
- C-type lectin-like proteins; and many others.^{5,6,7}

This complex mixture can vary across species, geographic distribution, and by time of year.¹ Snakebite venom is often delivered to the subcutaneous tissue. Direct intravenous injection from a snakebite is rare, but when it occurs, it may be fatal.⁶

EVALUATION

SIGNS AND SYMPTOMS

Severe pain and swelling at the site

of the bite are common.⁸ Ecchymosis, fluid-filled or hemorrhagic blisters, and extensive tissue destruction may develop.⁸ The bite site may become edematous and tense, although compartment syndrome is rare.^{1,8,21} The affected area should be evaluated every 15 to 30 minutes for swelling, tenderness, and hemorrhagic blebs until the tissue effects have stabilized.¹ Systemic toxicity is characterized by a metallic taste, oral paresthesias, tachycardia, hypotension, and anaphylaxis.⁸

LABS

Patients with possible snakebite envenomation should have a complete blood count, basic metabolic panel, prothrombin time, fibrinogen, and creatine kinase. Patients with systemic toxicity or comorbidities may warrant additional tests.^{1,8} Western pygmy rattlesnake envenomations have a higher incidence of thrombocytopenia and delayed coagulopathy.⁹ A retrospective chart review of 75 pit viper envenomation patients found that 60 percent of patients with western pygmy rattlesnake envenomations had thrombocytopenia.⁹ Laboratory studies should be obtained on arrival and repeated in 4 to 8 hours.⁸ If FabAV is administered, then platelets and fibrinogen should be checked 2 to 3 days after the last FabAV dose and again 5 to 7 days after the last dose.²¹ Routine measurement of D-dimer is unnecessary, as it does not accurately predict envenomation.¹

IMAGING

Imaging is not generally necessary but can be considered to exclude other causes of symptomatology (e.g., chest radiography for respiratory distress or retained foreign body).¹

MANAGEMENT

Immediately address life-threatening conditions such as airway compromise or hemodynamic instability.^{1,8}

Remove constrictive clothing and jewelry from the affected limb.^{11,12} Do not use tourniquets or pressure immobilization, as these can cause limb





WESTERN PYGMY RATTLESNAKE. PHOTO COURTESY OF KORY G. ROBERTS.

ischemia as well as increase local tissue damage and systemic absorption of the venom.^{10,11,12,22}

Elevation of the affected limb reduces hydrostatic pressures and improves tissue swelling. It also prevents venom from accumulating in the extremity, potentially reducing local tissue damage.¹ Lying with the bite in a neutral position is acceptable in the prehospital setting.¹² Cold-water immersion and cryotherapy with ice packs carry their own risks, as prolonged use may result in thermal injuries, and they are not recommended.^{10,11,12} Some experts believe that prehospital use of ice packs applied for a few minutes at a time (5 minutes on, and 10 minutes off)

is safe.¹¹ Marking the edge of tenderness/swelling on the skin, and writing the time alongside, aids in monitoring the progression of swelling and erythema.¹²

Analgesia is essential. Intravenous opioids are preferred over nonsteroidal anti-inflammatory drugs, as the latter may inhibit platelet function and are not as effective in controlling pain.^{1,12}

Crotalid venom can increase capillary permeability, so although euvolemia should be maintained, caution not to over-resuscitate with fluids is important, as volume overload may contribute to edema and tissue swelling.¹ Prophylactic antibiotics have not proven to be beneficial as there is low likelihood of infection, likely due

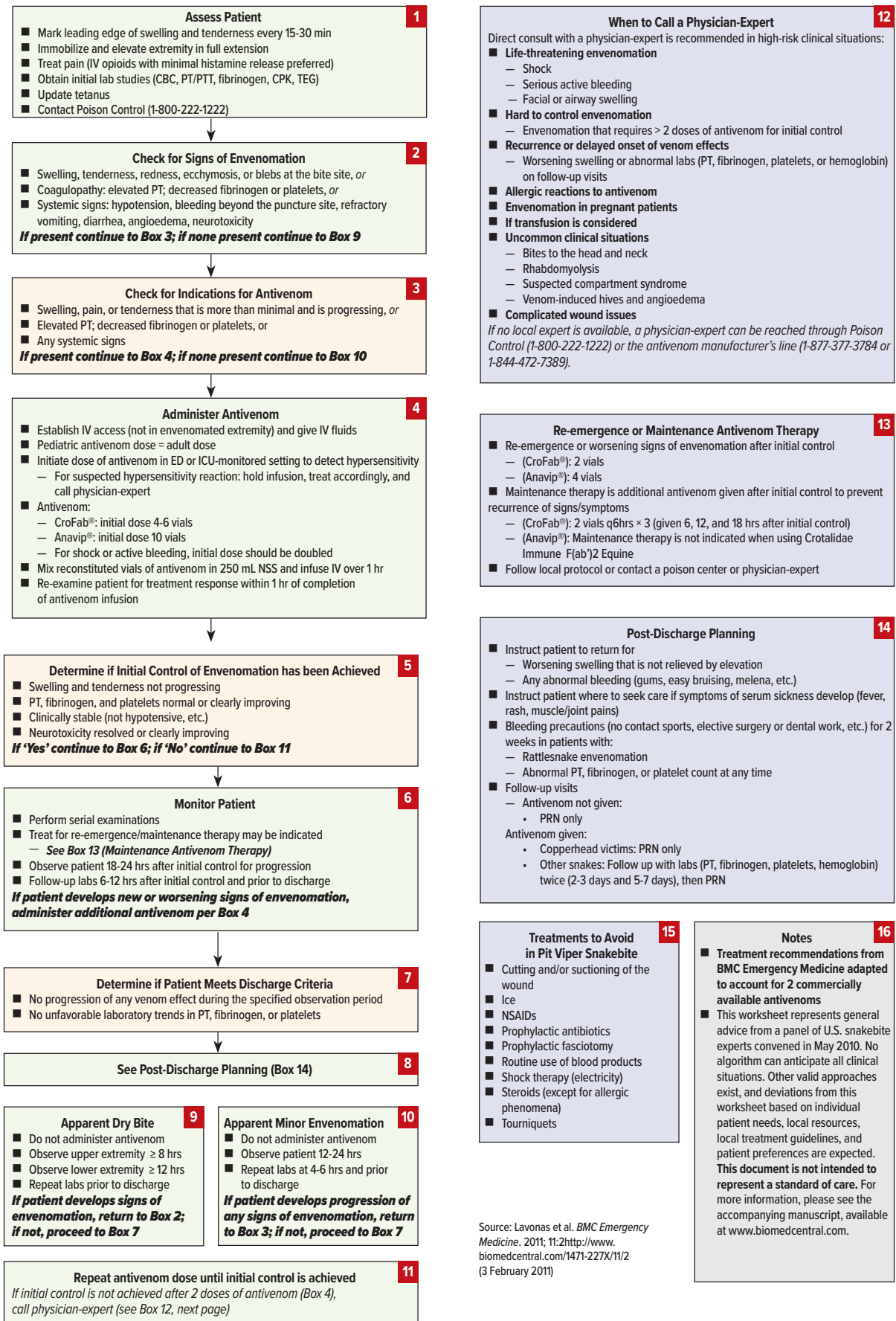
to the proteolytic properties of snake venom.^{1,6,8,21} Tetanus immunization should be administered if it is not up to date.⁸

ANTIVENOM

FabAV, known by the brand name CroFab® (generic: crotalidae polyvalent immune fab ovine), is one of two FDA-approved antivenom formulations for the treatment of crotalid envenomations. However, it is the only one approved to treat all North American crotalid envenomations.¹³

FabAV was released to the market in 2000.⁹ The formulation is derived from the venom of four North American snakes: Mojave rattlesnake

Figure 1: Treatment Algorithm for the Management of Pit Viper Snakebite in the United States.



(*C. scutulatus*); cottonmouth (*A. piscivorus*); eastern diamondback rattlesnake (*C. adamanteus*); and western diamondback rattlesnake (*C. atrox*).

As an ovine antivenom, production involves injecting small amounts of venom into sheep to create antibodies that can be extracted and processed to formulate FabAV.⁹ It should be used with caution in patients with allergies to sheep, latex, papaya, pineapple, papain, and bromelain.⁹ FabAV has cross-reactivity with a number of species, but there is no well-documented evidence of venom neutralization for the western pygmy rattlesnake.⁹

INDICATIONS FOR ANTIVENOM

The indication for administration of antivenom include:

- progressive local tissue injury. This is swelling that crosses any major joints (e.g., tenderness, swelling, or hemorrhagic blebs).
- systemic toxicity (e.g., hypotension, airway swelling, or neurotoxicity)
- hematotoxicity (e.g., prothrombin time >15 seconds, fibrinogen <150 mg/dL, or platelets <150,000 cells/ μ L).¹

The snakebite severity score was designed as a research tool and has not been validated for clinical decision-making. Reliance on this tool may result in undertreatment.¹⁴ Figure 1 shows the Unified Treatment Algorithm for Management of Pit Viper Snakebite in

the United States.

FABAV DOSING

The typical starting dose of FabAV is 4 to 6 vials. If control is not initially achieved, then another 4 to 6 vials should be administered.^{15,16} However, the initial dose may vary from 4 to 12 vials and is based on clinical judgment and the severity of envenomation.^{15,16} Dosing is the same for adult and pediatric patients.¹⁵

In FabAV clinical studies, “initial control” was defined as stopping progressive local effects and resolution of hematologic as well as systemic toxicity. It was achieved in 67 to 88 percent of participants.^{15,17}

Once initial control is achieved, the manufacturer recommends an additional 2 vials every 6 hours for up to 18 hours (total of 3 doses) to reduce the incidence of coagulation abnormalities due to residual venom.¹⁶

SURGICAL CARE

Compartment syndrome is a rare complication from crotalid envenomation.^{1,8,21} An expert panel of trauma surgeons and medical toxicologists concluded that prophylactic fasciotomy was not beneficial.^{18,21} The same group of experts stated that even in the rare event of compartment syndrome, initial treatment should be additional doses of antivenom, not fasciotomy, as antivenom is the definitive

treatment.^{18,19,20} Fasciotomy should be considered only in patients with elevated compartment pressures despite adequate antivenom therapy.¹⁹

CASE RESOLUTION

Our patient was noted to have significant pain and progressive swelling to the left foot. He received 4 vials of FabAV and morphine for pain control. Repeated laboratory testing obtained 5 hours after the bite showed normal platelets, prothrombin time, and fibrinogen. The snake was photo-confirmed to be a western pygmy rattlesnake. Repeated evaluation showed bruising and, very briefly, a rash on the shin. The patient was admitted to the PICU where an additional 6 vials of FabAV were given over 18 hours. The patient’s INR peaked at 1.1, with a platelet nadir at 193,000. He was discharged on hospital day 4 after swelling and color changes stabilized.

CONCLUSION

Western pygmy rattlesnake envenomations are a rare occurrence. FabAV has cross-reactivity with a number of species, but there is no well-documented evidence of venom neutralization for western pygmy rattlesnake envenomation. Our case highlights a moderate western pygmy rattlesnake envenomation in a pediatric patient — with the development of pain and swelling to a limb — that was responsive to FabAV. ★

TAKE-HOME POINTS

- Western pygmy rattlesnake envenomations are a rare occurrence but should not be underestimated, as they cause significant morbidity.
- The indications for administration of antivenom include:
 - progressive local tissue injury, which is swelling that crosses any major joints (e.g., tenderness, swelling, or hemorrhagic blebs)
 - systemic toxicity (e.g., hypotension, airway swelling, or neurotoxicity)
 - hematotoxicity (e.g., prothrombin time >15 seconds, fibrinogen <150 mg/dL, or platelets <150,000 cells/ μ L)
- The typical starting dose of FabAV is 4 to 6 vials. If control is not initially achieved, then another 4 to 6 vials should be administered every hour until symptoms are controlled. The initial dose may vary from 4 to 12 vials and is based on clinical judgment. The severity of envenomation should be considered, and toxicology should be consulted for recommendations. Once initial control is achieved, administration of an additional 2 vials every 6 hours for up to 18 hours (total of 3 doses) is recommended to reduce the incidence of coagulation abnormalities due to residual venom.
- Antivenom dosing is the same for adult and pediatric patients.

EMRA's

50th

Anniversary

**A CELEBRATION IN 2024
AS WE HONOR 50 YEARS
OF EMRA!**

Look for special events and promotions next year as we mark 50 years of serving emergency physicians-in-training, medical students, fellows, and EMRA alumni.

DETAILS COMING SOON ON [EMRA.ORG](https://www.emra.org)





From Response to Risk Reduction: The Evolving Field of Disaster Medicine

A Q&A WITH DR. GREGORY CIOTTONE

**Maj. Yevgeniy Maksimenko, MD, MPH, MA, FAWM,
DiMM, NRP, FP-C**

USAF Pararescue MP3 Medical Director
EMT Instructor Coordinator, Boston University EMS
Student and Resident Committee Scholarship Reviewer,
Wilderness Medical Society

Sriram Venkatesan, FAWM

Vice Chair, EMRA Prehospital & Disaster Medicine Committee
Medical Student
Sri Ramachandra Medical College, India/University of Colorado-Denver

“Jack of all trades, master of none — but oftentimes better than master of one.”

Perhaps this familiar quotation is especially accurate when applied to emergency physicians. EM training provides a unique “generalist” skill set that spans the breadth of medicine and beyond. Who’s at the frontlines of an aviation accident, a mass casualty incident, or a natural disaster? The foundation of knowledge established during an EM residency provides EM-trained physicians with the mindset to address any urgent and emergent medical issues. Some choose to further hone their skills in large-incident and disaster management by pursuing advanced training in disaster medicine (DM).

The 2009 United Nations International Strategy for Disaster Reduction (UNISDR)¹ defines “disaster” as any event causing significant disturbance to a community or country in which there are widespread health consequences and infrastructure damages, large enough to overwhelm local resources available to manage the incident. Such disasters can be natural (e.g., weather-related events) and man-made (e.g., terrorist attacks).

Since the turn of the century, large-scale disasters have included 9/11, Hurricane Katrina, the Haiti earthquake, Hurricane Sandy, the Ebola virus epidemic, the Nepal earthquake, California wildfires, and the COVID-19 pandemic, among others. Management of such incidents requires collaboration among multiple agencies, first responders, local, state, and sometimes federal assets, and ultimately medical care providers responsible for treating the injured. A disaster medicine physician provides essential, life-saving expertise by speaking the language of emergency managers and the medical community.²

As the COVID-19 pandemic and other disasters have shown, there is room for improvement in how large-scale disaster response is managed. Emergency physicians have the skills to take lead on tackling these issues — and with

more than a dozen established disaster medicine and combined EMS/DM fellowships across the country,³ training opportunities abound. Furthermore, to formalize the recognition of disaster medicine as a unique subspecialty, a push for ABMS/ABEM board certification is underway through ACEP’s disaster medicine section.

We interviewed Gregory Ciottone, MD, a leader in disaster medicine and president of the World Association for Disaster and Emergency Medicine (WADEM). Dr. Ciottone is also a founding director of the Beth Israel Deaconess Medical Center (BIDMC) Fellowship in Disaster Medicine and an associate professor of emergency medicine at Harvard Medical School. He gave us his thoughts about DM’s past, present, and future.

Tell us about your background. How did you get into disaster medicine?

Dr. Ciottone: I’m an emergency physician by training. I trained at the University of Massachusetts after medical school there and graduated from its EM residency program in 1994. I stayed on the faculty at UMass for about 6 years and then came to BIDMC and Harvard Medical School. I have now been here for about 22 years.

My career and interest in DM were really fostered almost accidentally. When I was a chief resident, shortly after the dissolution of the Soviet Union, the United States Agency for International Development (USAID) had developed a medical partnership program with former Soviet states and U.S. universities. I was lucky enough to be at UMass when we were awarded one of these partnership programs with Yerevan Armenia in the area of emergency and disaster care. The chairman at the time, Dr. Richard Aghababian — who was also president of ACEP in 1994 — led the first trip to Armenia and wanted one of the chief residents to go. I joke that the other 2 chiefs moved a step back and here I was, so I said “sure,” not really knowing anything about international work or disaster medicine. I was just trying to



GREGORY CIOTTONE, MD

get myself through residency and think about what I was going to do after that.

We then went on that first trip, and I had the opportunity to develop a number of courses that were taught at that center, designed to be “train the trainers” programs. We taught courses on emergency medicine, EMS, and disaster medicine. They were very successful, to the point where USAID adopted the model for 16 training centers across the former Soviet Union. I really fell in love with the whole idea of having this ability to reach out and successfully do this important international medical work.

The other sort of lucky part of my experience was that the National Disaster Medical System’s Disaster Medical Assistance Teams (DMAT) were just getting started, with only about 15-16 Level 1 DMAT teams in the country at that time — and one of them happened to be based at UMass. So I had an opportunity to join that team (DMAT Massachusetts-2 or DMAT MA-2) initially as a team physician. Several years later, I became the commander.

During my time there as commander from 1997-2003, DMAT MA-2 was one of the first teams (along with Massachusetts-1 and Rhode Island-1) that went into ground zero on 9/11. We stayed there 2 weeks, set up 5 field hospitals, and treated about 400 patients per day.

That deployment was life-changing for me — and one that molded my career. It was right about that time that all my various career interests started to coalesce into this true, real passion for



DR. CIOTTONE SPEAKS TO AN AUDIENCE AT THE WADEM CONGRESS ON DISASTER AND EMERGENCY MEDICINE IN BRISBANE, AUSTRALIA, IN 2019.

disaster medicine, both on the domestic and international fronts.

How do you define disaster medicine?

Dr. Ciottone: The definition of disaster medicine is constantly evolving, but in simple terms, it is the marriage of crisis health care and emergency management. And when you bring those two things together, you get DM. It is very unique. We do not wake up and go to the disaster clinic every day and see disaster patients. When we are operational it is during a crisis, by definition, and there is chaos. As my friend Craig Fugate, former director of FEMA under the Obama Administration, likes to say, “Anytime you have to deviate from your typical organizational chart in order to complete the mission, you are in a crisis or disaster.”

Disaster medicine brings those necessary pieces together. DM becomes operational in an event where your resources are overwhelmed, delivering health care assets to situations like a mass casualty event lasting a few hours or a pandemic such as COVID-19 that lasts 2+ years. To be most effective in response, we spend the majority of our time in mitigation and preparedness.

Where do you think DM is headed, with the evolving definition?

Dr. Ciottone: Disasters are different now. The easy way to look at it (probably not the most comprehensive) is to say that disasters are increasing in frequency. We have climate-related issues. We have these pandemics. We also have changing vulnerabilities. Simply looking at population centers, like a habitation map of where people are now vs. 100 years ago, you will see that so much more of the population is living in hazardous or at-risk places now — along coasts, for example. Historically and consistently, one of the largest killers has been natural disasters. The vast majority are water- and climate-related, whether that’s flooding or cyclonic events. These shifting vulnerabilities and risks demand DM evolves with them.

How is DM evolving? If you look at Hurricane Maria (2017) and similar events, studies of Puerto Rico and the Northern Caribbean show that more people died in the months following the hurricane than in the acute phase of the disaster. Then look at the COVID-19 pandemic now, ongoing for more than 2 years and probably will go on a bit longer with different global waves, what we call arcs of time. These phases force us to pivot over time to satisfy the surge needs, with no predictive modeling to follow that is 100% accurate. I think this is where the primary evolution of DM

is going to be, at least in the short term. Historically, we have paid attention almost strictly to the acute phase of disaster response, at least on the health care side. I think now we need to take a hard look at the post-acute phase as well. Now, I am not suggesting that DM should not be a subspecialty housed within EM. I think it certainly should be because there are some core skill sets, knowledge, etc., that you get from EM training. However, I do think we now need to reach across the aisle to other specialties like critical care, primary care, and some surgical specialties to get them trained in disaster medicine as well.

To that end, some years ago we started opening our fellowship to international and some select non-EM trained applicants. We have 85 alumni now, and probably 60% of them are international. You do not find emergency medicine everywhere in the world, right? So for these people, this subspecialty training prepares them for the role of DM specialist in their home countries. That’s a solid reason to expand and have other tracts into DM. Also, if we are training future DM specialists, they really need the skill sets necessary to deal with the entire disaster. I believe both the acute and post-acute phases are important; therefore, we have opened pathways to our DM fellowship training for non-EM physicians — much like the different paths to critical care or pediatric EM.

What is the training pathway for niches like counterterrorism medicine? Do fellowships offer focus areas for those interested?

Dr. Ciottone: In our fellowship, we do to a certain extent. Some fellows come in with a special interest while others do not, so it varies. We have plenty of fellows who graduate the program with no specific DM subspecialty interest, but equally we have many who do. For instance, we have had a number of fellows from the Middle East, and one of their big interests is mass gatherings around something like the Haj. We’ve had other fellows from areas prone to terrorist attacks, and the idea of counterterrorism medicine



DR. CIOTTONE AND OTHERS AT GROUND ZERO AFTER THE 9/11 TERRORIST ATTACKS

is in their interest. We also have those interested in humanitarian disaster response or disaster policy at the World Health Organization or governmental level. We take a vested interest in each fellow and tailor the program to specific needs.

There are ample DM training options — advanced degrees, FEMA courses, and of course fellowships. Is a fellowship more beneficial than, say, a master's degree in disaster management?

Dr. Ciottone: Well, I think everybody should do a disaster medicine fellowship (says with a wink and a smile). Obviously I'm biased, but it really depends on what you're trying to get out of it. I do think U.S.-based physicians interested in becoming specialists and leaders in the

field should complete DM fellowships. There are, however, some very good masters' programs out there. In fact, I used to teach for the European Master in Disaster Medicine (EMDM), which is a shared program between the University of Eastern Piedmont, Italy, and the Free University of Belgium — and I continue to collaborate with them. They grant a European master's, which is a bit different from a U.S. master's, but it's a valuable degree depending on where you are. In some parts of the world masters' degrees are more valuable and in other parts of the world fellowships are, and that really varies. I do not necessarily have a good handle on that, but I do not think one should be necessarily exclusive of the other. We have had a number of fellows who have also completed the EMDM.

For emergency physicians who would like to practice DM domestically and internationally, is a fellowship required, in your opinion, to be successful?

Dr. Ciottone: So that is a two-part question... Do I think a fellowship is required to gather all the skills needed to become a DM specialist? Yes, I do. We have a year-long program, and the curriculum barely fits into that time. My textbook has approximately 200 chapters, which is around 1,000 pages. There is a lot to know in disaster medicine. The breadth of information — from emergency management to specific events like pandemics, mass casualty incidents, chemical/biological/radiation, and everything in between — is vast. There is a lot of information to master.

So, do I think fellowship training is needed for developing that knowledge base and skill set to be a specialist and leader in the field? Yes.

Is a fellowship required to practice within disaster medicine? No, not necessarily.

As you know, there is no ACGME certification for DM right now. Some are working with SAEM and ACEP toward that potential goal. There is also no board certification, but again, we do not wake up and go to a disaster clinic every day and see disaster patients, so the reality is DM is probably always going to be a secondary specialty for all health care providers, and that is why I mentor and teach plenty of medical students. When a medical student comes to me and asks, “What do I have to do to be a disaster medicine specialist or follow in your career path?” I say what you need to do is first graduate medical school and learn medicine. That is the most important thing — No. 1, become a doctor. After that, or sometime concurrent to that in residency, start looking at DM. But you need to be a doctor first. You need to learn how to be a good physician, and then we will talk about disaster medicine. I say this because I really cannot think of many scenarios, outside of education and policy, where disaster medicine is your only career. However, because local disaster response is critical in the early days of any event, DM should be a secondary specialty for everybody in health care, with the caveat that there will be a growing need for DM specialists to lead through the mitigation, preparedness, response, and recovery phases.

Describe the lifestyle for a DM specialist — amount of time spent in the field vs. clinical work, for example.

Dr. Ciottone: Well, I am more than 30 years out, so I am currently more into education, training, and research, and my work with WADEM, etc. But I spent more than 25 years as a full-time clinical emergency physician and doing disaster medicine along with it. Back in my earlier days, when I was on the

DMAT and doing other things, I was very active in the field, with a lot of work overseas. I remember, the first 10 years out of residency, when I was working on average 3 months a year overseas, there were few opportunities to get funding, so I stacked my shifts and worked hard clinically before and after deployments. I think it’s a little easier now to find ways to be funded in DM because of more interest. Whether stemming from 9/11, recent terrorist attacks, natural disasters, or the pandemic, there is a lot of interest now from outside DM to work on funded projects. So, there are more opportunities now to get into a good situation where you can mix your career with some clinical, some academic, and some actual DM operations in a way that does not overwhelm you workwise or financially.

During your career, how did you land opportunities like working with the White House Medical Unit and DMAT?

Dr. Ciottone: You’ve just got to be a really cool guy! (Laughs) Honestly, I could not even tell you how I stumbled into all those opportunities. The world of DM is not that big, and as you start doing more and more, you start rubbing elbows with others and here you are. I’ve had the privilege of practicing disaster medicine pre- and post-9/11, and I remember distinctly talking in the 90s about preparedness and sounding like chicken little saying the sky is falling. But then on 9/11 the sky did fall, and suddenly all this attention came and everyone started paying more attention to disaster medicine. Since, there have been a number of large-scale natural disasters and other events.

What’s the career outlook for DM specialists?

Dr. Ciottone: The nature of disaster medicine is we have to prepare for these low-frequency, high-acuity disasters. We just have to. And again, historically it was hard to convince people of that. And now it is getting a little easier to convince others that we need to prepare on a

sunny day for a rainy day. So, there are going to be more and more opportunities for disaster medicine specialists going forward.

What skills are ideal for U.S.-trained and -based DM specialists who want to assist in an international response? Is there an overlap with global health?

Dr. Ciottone: In my opinion, there is an overlap with global health in the sense that you do practice in austere conditions, but it is also quite different. One is not more important than the other; they are both equally important. But international disaster response is not something you want to walk out the door toward with really nothing by way of training or understanding the bigger picture. It is not only the austere conditions that are of concern, but that where you deploy is also in crisis. For this reason, it is essential to understand the basic principles of disaster medicine if you plan to deploy to such events, and it is imperative that DM fellowship programs teach the safe and effective way to deploy into disaster zones.

In our fellowship, for instance, we do deploy our fellows to some disasters that fit our criteria of safety first and the doable logistics that are needed to be effective. We do not deploy them to every disaster, but we do deploy our fellows with some NGO partners to certain disasters. However, we do not deploy fellows without first putting them through a pre-deployment course that we have created within the fellowship. It is a 4-day course where fellows and faculty sleep in tents, and we teach everything from A to Z about being safe in an austere environment, emergency management, practicing field medicine, working with the United Nations, etc. So, we really put them through a disaster-zone simulation before we deem them deployable. And yes, we do have specific training in cultural awareness as well.

Does your program offer electives for medical students or residents?

Dr. Ciottone: We do, and I think



some other fellowship programs have opportunities for medical student electives as well. At Harvard Medical School, we also have a DM special interest group that we advise. We meet once a month with them to talk about general DM topics.

What has been the most fulfilling part of your career?

Dr. Ciottone: Well, I think the point we are at now in the BIDMC Fellowship in Disaster Medicine — 15 years old with 85+ alumni around the world, and watching all the great things the alumni are doing — is extremely rewarding. You would be hard-pressed to find a large-scale natural or man-made disaster and not have at least one of our alumni involved, typically in some sort

of leadership role. Honestly, it's like parents raising their children and being so excited about what everybody is doing. That is probably one of the most fulfilling parts of my career today.

The other is practicing disaster medicine in general. As emergency physicians, we are doing really great things with individual lives, truly saving people's lives by intervening in crisis situations for individual patients. You do a lot of good for that patient, and then you go on to the next patient, and it is a great thing, a great calling. I have really enjoyed being an emergency physician, but my career in DM is a bit different. As a DM specialist, you are doing that same sort of intervention, and even more on the mitigation and preparedness side, but to populations, to communities, to large groups of people. The train-the-

trainers program I mentioned earlier, well, some of those centers are still in operation and have trained well over 50,000 health care professionals. That is a really neat thing, knowing that you helped lead something that has had such a broad impact. So, while I enjoy the one-on-one, doctor-patient interaction, I also enjoy the crisis public health and DM part of my career. In disaster medicine, perhaps like few other fields, you have to know when to get off the operational "saddle." While I loved having my hair on fire all those years, I now very much enjoy the rewarding nature of teaching and training the DM specialists of the future. ★

Editor's note: This interview has been edited for length and clarity.

Thank You...



...for Your Support

Medtronic

mindray
NORTH AMERICA



SCP
HEALTH

TEAMHealth.

Teleflex®



VAPOTHERM®



Information accurate as of 8/17/2023. For an updated list of supporters, please visit www.emra.org/supporters.



Hand, Meet Autoinjector: Ouch!

Digital Ischemia to Fifth Digit From IM Epinephrine Successfully Treated With SQ Terbutaline

Nikhil Mohan, DO, FACEP
 Director of Emergency Ultrasound
 Emergency Medicine
 Promedica Monroe Regional Hospital

Paul Truong, DO
 Resident, PGY-3
 Emergency Medicine
 Promedica Monroe Regional Hospital

INTRODUCTION

Epinephrine autoinjectors are often prescribed for those at risk for anaphylaxis. A common occurrence with these autoinjectors is accidental injection into the wrist and hands. Although there are several occurrences of resultant digital ischemia, there are no standardized guidelines for management.

PRESENTING CONCERNS, CLINICAL FINDINGS

A 13-year-old patient with a past medical history of asthma presented to the emergency department after accidental injection of an epinephrine autoinjector into his left hand. His sister had been

teasing him prior to the event with the autoinjector, presuming it was a test pen, and proceeded to inject his hand with the pen. The patient stated that he felt immediate pain in the hand and started noticing that his fifth digit was beginning to turn “white” with reduced sensation.

On examination, the patient was alert and oriented; he appeared to be in minimal distress. Abnormal vital signs for the patient included tachycardia with

A common occurrence with autoinjectors is accidental injection into the wrist and hands.

an HR of 110 bpm and BP of 130/86 mmHg. Focused examination of the left hand revealed delayed capillary refill at the fifth digit, much greater than four seconds with sensation grossly intact, and notable whitish hue from the base of the left fifth digit extending to the tip. To the touch, his fifth digit was colder compared to the rest of his hand.

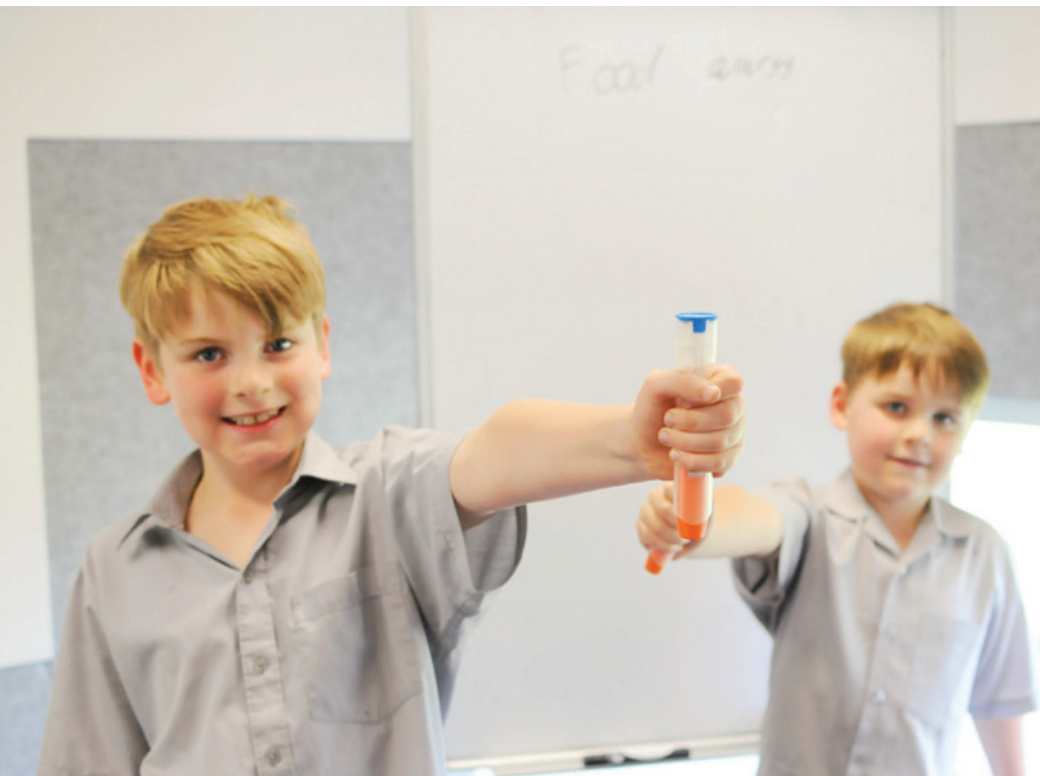
PATIENT COURSE

After the patient was roomed and underwent physical examination, the pharmacy was called for phentolamine for local injection in order to reduce the extent of digital ischemia from the epinephrine autoinjector. The pharmacy informed us that phentolamine was not available.

With additional research, the decision was made to use terbutaline as a second-line option to treat the patient’s digital ischemia. While waiting for the terbutaline to come from the pharmacy, nitroglycerin paste 2 percent was applied, but no improvement was noted after 20 minutes.

Terbutaline 0.25mg 1 mL was drawn up, placed in a 10 mL saline syringe, and injected into the base of the left fifth digit. Upon reassessment of the patient’s hand after 20 minutes, there was visible improvement in color with return of normal pigmentation, and capillary refill was <2 seconds. The patient was observed for another hour in the ED. There was no worsening of symptoms, and he was discharged home.

The following day the patient had an appointment with his pediatrician, who noted no abnormalities of his digit. A follow-up phone call was placed with his mother, who stated the patient had no





Digital ischemia after accidental injection of an epinephrine autoinjector can be treated with subcutaneous terbutaline injection. Terbutaline is a selective beta-2-agonist, resulting in vasodilation. This can help with digital ischemia by increasing blood flow and reducing tissue ischemia. For our patient, terbutaline worked more rapidly compared to topical nitroglycerin. Terbutaline is a good alternative to phentolamine for treatment of digital ischemia.

complications.

DISCUSSION

Epinephrine's primary mechanism of action functions as an alpha- and beta-adrenergic agonist, which can lead to vasoconstriction and increased vascular resistance. This can be problematic if injected into the digits and can lead to digital ischemia. Some current recommendations for treatment of digital ischemia are:

- **Phentolamine:** Functions as an alpha-1-receptor antagonist

leading to vasodilation. This would compete with epinephrine for these receptors.

- **Topical Nitroglycerin:**

Nitroglycerin is a nitrate vasodilator and is metabolized into NO. Nitrite oxide has action on the vascular smooth muscles, which can cause arterial and vasodilation.

CONCLUSION

Digital ischemia after accidental injection of an epinephrine autoinjector can be treated with subcutaneous terbutaline

injection. Terbutaline is a selective beta-2-agonist, resulting in vasodilation. This can help with digital ischemia by increasing blood flow and reducing tissue ischemia. For our patient, terbutaline worked more rapidly compared to topical nitroglycerin. We were able to return good flow to the patient's finger and normalize capillary refill and color shortly after injecting terbutaline. Terbutaline is a good alternative to phentolamine for treatment of digital ischemia. ★

BE A LEADER!

Apply for EMRA Committee Leadership

EMRA is seeking applicants for committee leadership roles. Our committee leaders — chairs, chairs-elect, and vice chairs — are in unique positions to expand their networks while advancing the body of knowledge for the emergency medicine specialty. By serving in a leadership role, you can take advantage of **excellent learning opportunities** while **piloting your committee to soaring heights.**

**Chairs, chairs-elect, and vice chairs
earn travel stipends!**

Apply now to lead an EMRA committee!

Application deadline — Nov. 1, 2023

Learn More



Apply Here



EMRA Health Policy Academy

A Call for Applications

EMRA Health Policy Academy is a highly selective year-long experience that trains you to be a policy advocate in emergency medicine. It's designed to give passionate residents like you the opportunity to impact policies that affect EM and your patients at a local, state, and national level. HPA Academy gives you knowledge and tools to set you up for a lifetime of advocacy.

Application Deadline: Nov. 1, 2023

More Information



Apply Here



EMRA/ACEP Leadership Academy

A Call for Applications

The EMRA/ACEP Leadership Academy is a professional development program and virtual community for emerging leaders in emergency medicine. This one-year progressive experience provides instruction in key leadership tenets and helps you meet peers and mentors who are building the specialty alongside you.

Application Deadline: Nov. 1, 2023

More Information



Apply Here



The Trouble With Plasma

Remunerated Plasma Donation Remains a Moral Quandary

Ellen Shank, MD

Resident, PGY-3

Emergency Medicine

University of California Davis Medical Center

Remunerated plasma donation remains a necessary unpleasantness. In response, we can bolster the voluntary systems that uphold our country's current blood product supply by signing up for regularly scheduled donation appointments.

An email notification pops up on my phone from our department chair, with a photo of him smiling alongside two bagged units of packed red blood cells with a large bore IV in his forearm: "I'm scheduled for my routine every four- to six-week donation and just want to remind everybody that if they can, please try to donate!"

We are three years deep into the COVID pandemic, and along with myriad

other supply chain issues, blood and blood products continue to be scarce. I think back to a year-and-a-half ago...

I was a fourth-year medical student, engaged to my now co-resident, with time on my hands and trying to scrape together some money for a wedding. I had heard about plasma donation as a side gig from a seasonal outdoor guide and decided to give it a go.

The nearest plasma donation site was

just 10 minutes away from my house, and I began donating every week, raking in a respectable \$200 weekly on the prepaid debit card that I was provided. On top of it all, I was granted a \$40-per-donation boost because I qualified as a convalescent plasma donor, being fully vaccinated and having contracted COVID during my anesthesia rotation.

After several weeks of regular donation, I began to notice trends. Frequently, when I arrived for the appointments, I was the only one in the room who was not a person of color. And more often than not, one or two shopping carts filled with personal belongings were situated at the front entrance, suggesting that an unhoused person had recently arrived for their donation appointment.

We were a group of folks that had sought out a supplemental revenue stream, and it happened to be the sale of our bodily fluids.

A month after becoming a certified convalescent plasma donor, I again contracted COVID and was forced to take several weeks' hiatus from the plasma side hustle. This break gave me a chance to reflect: Is this conscionable? What rules are in place to assure for-profit blood-product companies do not take advantage of vulnerable populations?

It turns out the U.S. Food and Drug Administration (FDA) has quite a few rules when it comes to source plasma establishments (SPEs).¹ There are regulations limiting the frequency of donations, and donors are required to

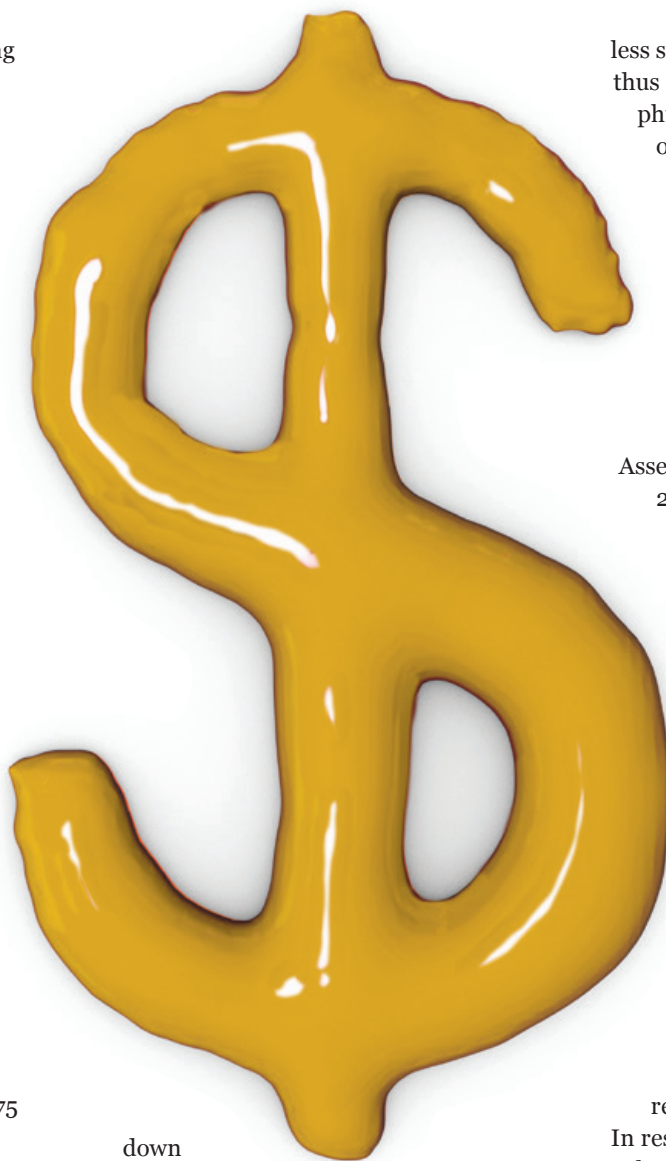


pass an extensive medical screening questionnaire, as well as undergo a physical exam and evaluation of their hemoglobin and cholesterol. SPEs are required to advise donors about the possibility of immunosuppression² as part and parcel of the donation process, though for the life of me I cannot remember this being emphasized during my own consenting process. Reading through the FDA guide, it seems there are far fewer safety stipulations protecting donors than there are benefitting recipients.

The United States is one of the few countries that allows for remuneration of plasma donations. After an international scandal involving the exploitation of Nicaraguan citizens by dictator Somoza via the sponsoring of a giant plasma center — termed Casa de Vampiros, or House of Vampires — to provide a source for the highly profitable global plasma market,³ the World Health Organization (WHO) released a statement in 1975 to ban such practices and contract the globalization of plasma sales. Many countries, including Nicaragua, were on board at the time. However, countries such as the United States, Brazil, Germany, and the Czech Republic declined to adhere to the WHO guidelines and went on to corner the blossoming multibillion-dollar market.

The U.S. now provides roughly 38 percent of the plasma supply for the European Union. A majority of plasma centers in the U.S. are located in zip codes with higher-than-average poverty rates. Many of the most productive centers are situated in counties that line the U.S.-Mexico border.⁴

Platelets and whole blood products in the U.S. continue to be sourced from volunteers on four- to six-week donation cycles. The COVID-19 pandemic tamped



down the supply of donated products; fortunately, after a concerted marketing effort revealing this decrease, many communities responded in a heartwarming turn.⁶

Although it is legal to remunerate platelet and whole blood donors, the FDA requires these products to be identified as coming from volunteer or paid donations. After studies from California demonstrated higher rates of HIV-positive samples from paid donors,⁷ many hospitals began to refuse these products.

Because plasma requires more complex purification and reconstitution processes to be incorporated into resultant medication therapies, it has

less stringent labeling practices, and thus SPEs continue to benefit from philanthropic or enterprising efforts of volunteers — many of whom hail from lower socioeconomic status.

Is the remunerated exchange symbiotic or predatory? The situation seems to buck categorization. Wiser minds have dedicated extensive efforts to make the relationship more favorable toward both parties. A World Health Assembly (WHA) declaration from 2010 acknowledges the pitfalls of remunerated blood product sources, but also acknowledges the severe shortage of plasma and prioritizes the development of self-sustaining practices.⁸ After all, the only countries that can claim to be self-sufficient in plasma production are those that allow companies to pay plasma donors.⁴ Nowhere in its declaration does the WHA urge member countries or request the director-general for movement to a volunteer-only system.

Remunerated plasma donation remains a necessary unpleasantry. In response, we can bolster the voluntary systems that uphold our country's current blood product supply by signing up for regularly scheduled appointments. ★

TAKE-HOME POINTS

- Find a blood donation drive near you and donate this week.
- Implement an intermediate transfusion strategy in your ED.
- The global plasma market is huge. Check out the current market and the World Health Assembly's declaration on blood products.

Case Report: Managing a Left-sided Tension Pneumothorax With Patient History of Remote Right Pneumonectomy

Lachlan Driver, MD

Harvard Affiliated Emergency Medicine Residency
Department of Emergency Medicine
Mass General Brigham

Michael VanRooyen, MD, MPH

Chairman, Department of Emergency Medicine
Mass General Brigham
J. Stephen Bohan Professor of Emergency Medicine:
Harvard Medical School
Lavine Family Professor of Humanitarian Studies:
Harvard TH Chan School of Public Health



IMAGE 1

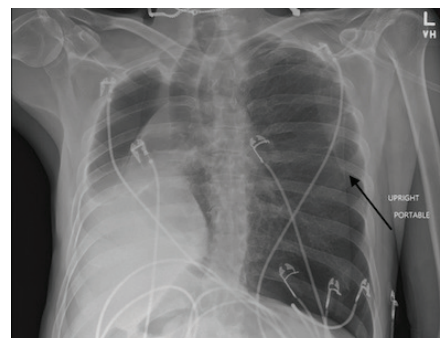


IMAGE 2

BACKGROUND

The patient, a 53-year-old male, has past medical history notable for lung cancer, right lung pneumonectomy approximately one year ago, and recent bronchoscopy three days prior to ED arrival. He presented to the emergency department with sudden-onset severe shortness of breath immediately prior to arrival. In the ED, the patient was visibly tachypneic, diaphoretic, anxious, using accessory muscles of respiration, and appeared to be rapidly compensating toward extremis.

EXPLANATION

Left-sided tension pneumothorax with history of remote right pneumonectomy. Our initial differential diagnosis included upper respiratory compromise

(e.g., epiglottitis or internal obstruction due to recent procedure), tension pneumothorax, post-pneumonectomy syndrome (PPS), flash pulmonary edema, cardiac tamponade, ACS, and less likely DKA or anaphylaxis.

On portable chest X-ray outside of the patient's room, the patient was noted to have a left-sided pneumothorax in his remaining lung with tracheal deviation to the right. In the context of rapid decompensation, a 14-gauge needle was placed in the left anterior third intercostal space, which temporized the patient. Subsequently, a 14-French chest tube was placed in the patient's midaxillary line on the left side, with immediate improvement of hemodynamics, tachycardia, and respiratory rate. The patient was

admitted to thoracic surgery service and was doing well approximately three months out without pneumothorax recurrence.

DESCRIPTION

The leading cause of iatrogenic pneumothorax is transthoracic needle aspiration, though in this case, pneumothorax was most likely due to transbronchial lung biopsy two days prior to presentation.¹ Although this patient had a tension pneumothorax, it is worth noting that post-pneumonectomy syndrome (PPS) is a rare post-pneumonectomy complication occurring typically within several months and caused by excessive mediastinal shifting that results in airway compression.² *

Recognition and Reward!

EMRA Awards & Scholarships

Recognize excellence in emergency medicine by nominating yourself or colleagues for a coveted EMRA Award. Winners are selected for the following awards:

CORD Academic Assembly Travel Scholarship

LAC Travel Scholarship

EMRA/ACEP EMBRS (Emergency Medicine Basic Research Skills) Scholarship

EMRA/EDPMA Scholarship

SAEM Travel Scholarship

ACEP Travel Scholarship

ACEP/CORD Teaching Fellowship Scholarship

Augustine D'Orta Humanism Award

Stephen Tantama, MD, Military Excellence Award

EMRA/ACEP Resident-Fellow Health Policy Elective in Washington, DC

EMRA/ACEP Medical Student Elective in Health Policy

Academic Excellence Award

ACEP Scientific Review Subcommittee Appointment

ACEP/EMRA National Outstanding Medical Student Award

Dr. Alexandra Greene Medical Student of the Year Award

Jean Hollister Contribution to Pre-Hospital Care Award

Fellow of the Year Award

EMRA Resident of the Year

Rosh Review "One Step Further" Award

Faculty Teaching Excellence Award

Faculty Mentor of the Year Award

Joseph F. Waeckerle, MD, FACEP - Alumni of the Year Award

And more!

For application forms, nomination deadlines, and details about the EMRA Awards, visit

emra.org/awards



#EMRAAwards



What It's Like Being an Emergency Physician at a Rural Critical Access Hospital

A Q&A With Longtime Practitioner Dr. Jeremy Sturgell

Christian Casteel, DO

Resident, PGY-2
Emergency Medicine
Rush University Medical Center

The designation “Critical Access Hospital” was created after the passage of the Balanced Budget Act of 1997 and is given to rural hospitals deemed eligible by the Centers for Medicare & Medicaid Services (CMS).¹ This was a legislative response to the closure of more than 400 rural hospitals in the 1980s and early 1990s. For a hospital to get critical access status, it must meet the following criteria:

- Have 25 or fewer inpatient beds
- Be located >35 miles from another hospital (there are some exceptions to this)
- Have an annual average length of stay of 96 hours or less for acute care patients
- Have 24/7 emergency care services

Given that patient visits to emergency departments in rural and critical access hospitals have risen 50 percent in the past 10 years in the United States, it is clear that emergency physicians currently are, and will continue to be, desperately needed in this setting, especially as these communities disproportionately have less access to primary care.

As of 2022, there were 1,360 critical access hospitals in the United States. As mentioned above, every one of these hospitals must have 24/7 ED services and at least 1 MD/DO on call and available to be on site within an hour.¹

Given that patient visits to emergency departments in rural and critical access hospitals have risen 50 percent in the past 10 years in the United States, it is clear that emergency physicians currently are, and will continue to be, desperately needed in this setting,² especially as these communities disproportionately have less access to primary care. Though exposure to rural/critical access emergency departments during residency training is becoming more common, it is still often minimal or completely lacking.

I had a discussion with Jeremy Sturgell, MD, who has been practicing emergency medicine in the rural/critical access setting for more than a decade. The goal of this piece is to increase awareness and education regarding EM practice and lifestyle in this setting, particularly for residents considering a career in rural EM.

Dr. Casteel: Can you give readers a little background on yourself?

Dr. Sturgell: I practice in southwest Missouri in a small critical access hospital. Our ED volume is around 7,000 visits annually. I went to medical school at the University of Missouri Columbia and then did an emergency medicine residency at the University of Illinois College of Medicine in Peoria, Ill. I grew up in our county, so immediately after graduation from residency I took the role as director at our hospital. I've been in that role for 12 years now. About half of that time, we were an independent

critical access hospital. About five years ago, we affiliated with a larger regional system.

Dr. Casteel: Other than the larger hospital affiliation, have you seen any other major changes in the 12 years you've been there?

Dr. Sturgell: When I started, I was the only residency-trained, board-certified emergency physician in the group and in our county. One of my many roles as an administrator has been recruiting. I'm pleased to say that we now have a group of six residency-trained, board-certified EM physicians, which is unusual for critical access hospitals to be able to achieve.

Dr. Casteel: How did you end up in rural practice? Is it something you knew you wanted to do as a resident?

Dr. Sturgell: When I started, I imagined I would end up at a larger community medical center like the majority of EM graduates. When I was in residency, our program required us to work two shifts a month on the helicopter service during training. I had a very scary near-accident on a flight made in bad weather, so I told them I wasn't going to fly anymore. In lieu of that, I started working two shifts a month in a rural department in central Illinois. It was a great experience and really opened my eyes to rural emergency medicine.

Dr. Casteel: How do you feel EM residency prepares or exposes trainees to rural EM practice?

Dr. Sturgell: I've learned over my career that we need to do all we can to get our

colleagues into rural settings — especially places of leadership in these rural settings. That is where we can make the most impact. I think it should be a goal of our professional societies to at least have a residency-trained, board-certified emergency physician directing every rural emergency department in America. Many graduates leave residency without any understanding of rural emergency medicine or any appreciation that there exists a whole network of critical access hospitals in this country with a desperate need for qualified emergency medicine practitioners. I know some of our professional societies are actively looking into solutions for this issue, and I certainly think requiring rural emergency medicine rotations at the training level is a necessity. I think now more programs have seen the light and have incorporated rural rotations into their curriculum. I think this is important because there does not seem to be a lot of mentors in academic emergency medicine who practice in a rural setting.

Dr. Casteel: In your opinion, what is an advantage you find with your practice setting over a more urban setting?

Dr. Sturgell: One significant advantage I have found in practicing rural emergency medicine is the freedom you have with scheduling. This can often be an angle for recruiting. If your ED volume is low enough, you can safely do 24-hour shifts. Our full-time docs work five 24-hour shifts a month. This allows for plenty of time off that can often be arranged for extended time periods. It's not unusual for our docs to easily get 10 days off at a time if needed for vacation. I found that this has been a very important factor in recruiting EM docs from larger tertiary

Though exposure to rural/critical access emergency departments during residency training is becoming more common, it is still often minimal or completely lacking.

centers. While I lived locally, all of my other docs on the roster lived out of town — commutes anywhere from 45 minutes to 1.5 hours. Obviously the 24-hour shifts make the longer commute more feasible.

Dr. Casteel: A common question from EM residents regarding rural EM is, “How do you stay current on EM literature/guidelines and procedural skills?” What do you recommend?

Dr. Sturgell: I make an enormous effort to stay current. Part of this is because we obviously are a single covered shop, and I don’t have a partner to bounce things off of in real time. With my time off, I also moonlight at other facilities. During those commutes, I listen to the products from EM:RAP. If I have some downtime between patients on shift, I usually am able to watch a few lectures from Virtual ACEP. In terms of procedures, I usually make it a point to go to a difficult airway course every seven years or so, but otherwise I feel like I get more than enough procedures. Airway skills and vascular access probably are the most critical skills to maintain. You can usually find a conference or skills lab somewhere if needed as well. Our larger health system has a program that would allow me to travel to the tertiary center in order to get procedural numbers if I felt it was necessary. They would even allow me to go and get deliveries if I so desired. I think that is a big benefit of having affiliated with a larger system. So the point being is that if you’re practicing in a rural setting and begin to feel like your procedural skills are “rusting” a little, it’s not hard at all to find ways to address this.

Dr. Casteel: In your opinion, what are some of the biggest challenges with practicing EM rurally that you would want new grads to know about?

Dr. Sturgell: Clinically the biggest

challenges, especially for those new to rural settings, are that some of the decisions you need to make and factors you need to take into account are often unfamiliar to a new graduate or even a seasoned practitioner who has practiced in a larger tertiary center. You have to have an advanced understanding of EMS, EMTALA, and your own hospital’s capabilities as well as the capabilities of your region in order to get the critically sick and injured to the correct receiving facility. Transfers can be very frustrating and stressful. There were times during the pandemic where we could not find a receiving facility for our most critically sick and injured patients, and you had to sit on them and do the best you could until they could get definitive treatment. And there is no one to directly help you manage these patients typically. Taking care of the sick and injured is still very rewarding, but it quickly becomes frightening and stressful if you can’t get the patient to the proper destination.

It takes a lot of courage to practice in a rural setting and, in some ways, you have to be always at your best because at most places, you have no physical backup. It’s a much more hands-on job in a rural setting, in my experience. For example, I used to occasionally moonlight in a large Level I trauma center. I did much less direct patient care on the very sick trauma patients who arrived in that setting than I do when we receive trauma at our rural facility. In many rural settings, it is just one or two nurses. You are not going to be able to run a resuscitation from the back of the room. You have to be directly involved, and oftentimes you need to be very facile with procedures that we would traditionally assign to nursing staff.

Dr. Casteel: What about challenges from an administrative standpoint in the rural setting?

Dr. Sturgell: Administratively, the

challenges are always recruiting. So, as I’ve mentioned, my role administratively has always been one of chief recruiter and someone who is able to sell this job and lifestyle to other EM docs. Another administrative challenge is always being chronically resource-deprived and being asked to do much with little. We have been blessed that our facility has recently affiliated with a larger medical center — which has helped immensely — but I know many smaller facilities in the country have not been so lucky. Many operate on razor-thin margins, so there may not be capital to pursue board-certified emergency medicine docs or purchase needed equipment for the department. Even at our hospital, I’ve had to obtain some of our equipment through outside sources through grant writing.

Dr. Casteel: When you have a tough case, how do you typically go about getting specialist input or help?

Dr. Sturgell: You really have access by phone to almost all specialists based on your regional hospitals. Every small rural hospital has to have pre-existing transfer arrangements within whatever region it abides. So this shouldn’t scare anyone away from practicing in a rural setting. You can always get a phone consult, even from a hospital outside of your system if necessary, based on these agreements and based on EMTALA.

Dr. Casteel: What is the most rewarding thing about where you practice?

Dr. Sturgell: The most rewarding aspect is having the opportunity to practice in the rural county where I grew up. There isn’t a single shift that goes by when I don’t know most of the patients I see or their families. Furthermore, I am always running into patients I’ve treated out in the community, and I’m not afraid to give out my personal phone number



liberally. And these are good things. What is very memorable and humbling is when you see a patient or their family in the community, and they tell you how grateful they are for the care you gave them or for saving their life or the lives of their loved ones. Also, when the patient asks you if you have your own private practice because they would like you to be their doctor. I think this is one of the highest compliments we can receive as emergency physicians. I feel like they hold me to a higher standard of practice and behavior and make me aware that I always need to strive to be at my best. I feel a deep sense of obligation to the community in which I practice, and that

is a wonderful thing that protects against the cynicism that can develop in our field.

Dr. Casteel: What is something you've learned or experienced while working in the rural setting that you didn't know or expect going in, that you'd want to tell residents with an interest in rural medicine?

Dr. Sturgell: I think I didn't realize how fulfilling rural emergency medicine would be. I really struggled coming out of residency with the thought that I was taking a "step down" by not going to a larger tertiary center. I had those same biases I spoke about, so it was

nice to find that the reality was the exact opposite. What I would tell any resident interested in practicing rural emergency medicine is that rural America is a great place to raise a family and a great place to practice medicine. Your skills and training are critically needed in these settings and will be highly valued by your hospital and your communities. The work-life balance can't be beat. The cost of living can't be beat. If you lean in and engage, you will be more important to your hospital, medical staff, and community than you would working in a larger environment. ★

PERKS

for our #EMRAfamily

You know about our chock-full EMRA Member Kit boxes. But how about better mortgage and student loan rates? Or special pricing for exam prep? Plug in to all the valuable discounts, access, and information you get through EMRA.

Board Prep

Hippo EM
PEERprep
Rosh Review

Education

EM:RAP
Annals of EM
EB Medicine
EMCrit
Resuscitative TEE Workshop

Financial

Laurel Road
Doctors Without Quarters
Integrated WealthCare
Jay Weinberg Financial Services

Wellness

Headspace

Professional Development

ACEP
emCareers

Visit emra.org/benefits
and get the most from your membership



Medical Students | Residents | Fellows | Alumni
Oldest & Largest EM Resident Association

PERKS

What's in your EMRA Member Kits?

Students

Antibiotic Guide
EM Fundamentals
Basics of EM
Airway card
ECG Interpretation card
Student Advising Guide

Intern Gift

- **Basics of EM (DDx builder)**
- **Basics of EM: Pediatrics**
- **Trauma Guide**

This is a *free gift* from EMRA to every EM intern (via your program coordinators). This is NOT tied to membership - it's simply our way of saying "Welcome to EM!"

Residents

Antibiotic Guide
EKG Guide
Toxicology Guide
PressorDex
Ortho Guide
EM Fundamentals
PEM Fundamentals
Pain Management Guide
Regional Nerve Block Guide
Critical Meds badge cards
Airway card
Pediatric Qwic card
Neonatal Resuscitation card
Ventilator Management card

Alumni & Fellows

Antibiotic Guide
Toxicology Guide
PressorDex
Ortho Guide
Advocacy Handbook
Critical Meds badge cards
Ventilator Management card
Neonatal Resuscitation card
Pain Management Guide (*fellows*)
Pediatric Qwic card (*fellows*)
Urgent Care Guide (*alumni*)

Look online for digital resources:

EMbark career microsite
Fellowship Guide
Wellness Guide
Simulation Case Book

EM Resident quarterly publication
EMRA*Cast podcast
EMRA Match for Residencies
EMRA Match for Clerkships
EMRA Match for Fellowships

Free modules within MobilEM app:

- Transgender Care Guide
- Splinting Guide
- Patient Conversation Toolkit



Visit emra.org/benefits to access additional perks: EM:RAP, board prep, financial services, and more!



Donating Eggs in Medical School: A Story of Bodily Autonomy and Privilege

Elise Prehoda

Medical Student, MS-4
Robert Larner College of Medicine
University of Vermont

A CLASS THAT CHANGED THE COURSE OF MY LIFE

On a blustery mid-November morning, as I sat at my desk reviewing pre-work for an upcoming human development and reproductive health course session on “Fertility and Infertility,” the sentence jumped out from the page at me.

“Donor eggs are sometimes used for people who cannot produce eggs.”

Having no prior knowledge of assisted reproductive technology (ART), I quickly googled “egg donation” and was met with a barrage of advertisements.

As a second-year medical student who had recently been anxiously struggling with unanticipated medical expenses and no viable income, I thought about the upcoming months-long amount of time during which I would solely be studying for my first board exam, largely confined to my office and figuratively tied to my desk.

My thought process was complex, but surprisingly quick. Within weeks of that initial Google search, I applied to become a donor.

TESTS, PAPERWORK, AND MORE TESTS

After submitting countless pages of paperwork detailing my own medical history, my family medical history, and basic personal information and physical characteristics, I was invited to undergo further baseline testing. For the next week, between classes, I underwent blood tests, genetic tests, psychiatric evaluations, and more. Almost a month later, I received word that I was cleared to become a donor. The next day, I went “live” on the portal. Within 24 hours, a recipient had selected me as a potential donor. An appointment was

scheduled for the following week to begin treatment.

As I read each page of informed consent, signing my name as I went, I was met with bolded and underlined terms such as “ovarian hyperstimulation syndrome (OHS)” and “ovarian torsion.” My pen hovered over the paper with uncertainty as I read about these serious potential side effects of the treatment and retrieval procedure.

My pen hovered over the paper with uncertainty as I read about these serious potential side effects of the treatment and retrieval procedure.

The nurse assured me that although my baseline hormones indicated I was at a higher risk for OHS, they would be monitoring me closely for prevention. Regarding my risk for ovarian torsion, she took the opportunity to review my exercise restrictions, more limiting than I had anticipated. Initially taken aback, I assured myself that exercise would be minimal over the following weeks anyway, due to studying for the Step 1 exam.

I signed and we moved on.

My training and intake complete, I left for home.

The next morning, I gave myself my first injection.

THE NEXT 12 DAYS

Every morning for the next 12 days, I awoke and started my new daily routine. Rather than my usual *wake up, feed cats, make coffee, study*, my routine became

wake up, feed cats, make coffee, give injection, study.

The morning injection, menotropins, was a combination of follicle stimulating hormone (FSH) and luteinizing hormone (LH). To inject, I first had to dissolve the powder form in a small amount of saline. Then, while pinching about an inch of skin on my abdomen between my fingers I inserted the needle at a 45-degree angle and injected the medication, carefully discarding the needle and syringe into the provided sharps container afterwards. The entire process took about 10-15 minutes each morning.

Then I would attend class.

At night after a long day of studying and exactly 12 hours after my morning injection, I repeated the process. The nightly injection was a drug called follitropin-alfa, essentially an additional dose of FSH.

After a week of twice-daily injections, I returned for a follow-up ultrasound. During this ultrasound, my stimulated follicles were measured and the ultrasound tech beamed with pride and enthusiasm as she noted that I would likely start coming in more frequently for closer evaluation. Impressed with my own perceived success, I returned home with a sense of satisfaction and prepared for an increased frequency of check-ins.

I mention “perceived” success because I often questioned the accolades and congratulations I received simply for my body responding as expected to the medications I was administering. What would it mean if I did not respond well to them? Would I be considered a failure or a letdown? What does that mean for the individuals to whom I am donating my eggs? Would they be considered failures for their inability to produce eggs?

Unsettled by these thoughts but unable to pay them the attention they deserved, I ultimately chose to allow myself to be propelled forward rather than hindered by them on my journey.

After what seemed like weeks (but in reality, only 12 days), I was finally given the go-ahead to prepare for surgery by administering my “induction” medication, leuprolide. By the day of my retrieval, I was moody, irritable, bloated, and eight pounds heavier, but thrilled again at my success for having finally reached this day. After a brief meeting with the attending physician, nurse, and anesthesiologist, I was brought back to the surgical suite and the retrieval occurred.

Throughout this experience, I came to realize that while compensation may have originally caught my eye months earlier, it was certainly not enough to keep me invested in the process.

RECOVERY: PHYSICALLY, EMOTIONALLY, AND MENTALLY

After waking from anesthesia, I was subdued but ecstatic. I was promptly greeted with my much-anticipated payment — and an entirely unanticipated note from the recipient that meant the world to me. Our first and only communication throughout the entire process, her words of gratitude quieted every voice of doubt and bitterness that I had experienced over the prior two weeks.

Returning home, I was wholly unprepared for the debilitating cramping and pain, the continued swelling, the persistent moodiness, and the overwhelming fatigue that I experienced over the following few days.

On day two of post-retrieval, I received a call from the clinic.

“You were the perfect donor!” they exclaimed, explaining the number of eggs



I produced and the relative ease with which my donation process went.

Unwilling to tamp their excitement, I assured them that recovery was going great and I had no concerns. A week later, I finally returned to my weekly co-ed recreational soccer game. Physically, I was technically healed. Emotionally, I felt self-conscious, out of shape, and unsteady on my own feet.

REFLECTIONS AND WHAT I WISH I'D KNOWN

Throughout my experience of donation, I attempted to keep a journal: to reflect on my mental and physical well-being, to occupy myself in lieu of exercise, and to document the process I was going through. I imagined I would be able to produce some succinct, de facto statement regarding egg donation that I could herald

As a second-year medical student who had been anxiously struggling with unanticipated medical expenses and no viable income, I thought about the upcoming months-long amount of time during which I would solely be studying for my first board exam, largely confined to my office and figuratively tied to my desk. My thought process was complex, but surprisingly quick. Within weeks of an initial Google search, I applied to become an egg donor.

to all those interested in donating. The result of my journaling could not have been further from that goal.

What I came to realize were the following personal truths:

PRIVILEGE

Even now as I write this in the setting of an overturned *Roe v. Wade*, I cannot help but consider the privilege that comes with my ability to donate eggs — the privilege to live in a state where reproductive rights are protected; the privilege to possess features sought out by recipient parents, leading them to

quickly select me as a donor; and most notably, the privilege to obtain an egg donor with features like mine should that be a path I choose or require later in life.

As a staunch advocate for gender equity and intersectional feminism, when discussing reproductive rights I often focus on the right of individuals **not** to reproduce — the right to consent; the right to contraception; the right to a safe abortion; the right to adequate sex education. Rarely, however, have I focused on the right of individuals **to** reproduce, a subject that suffers from an

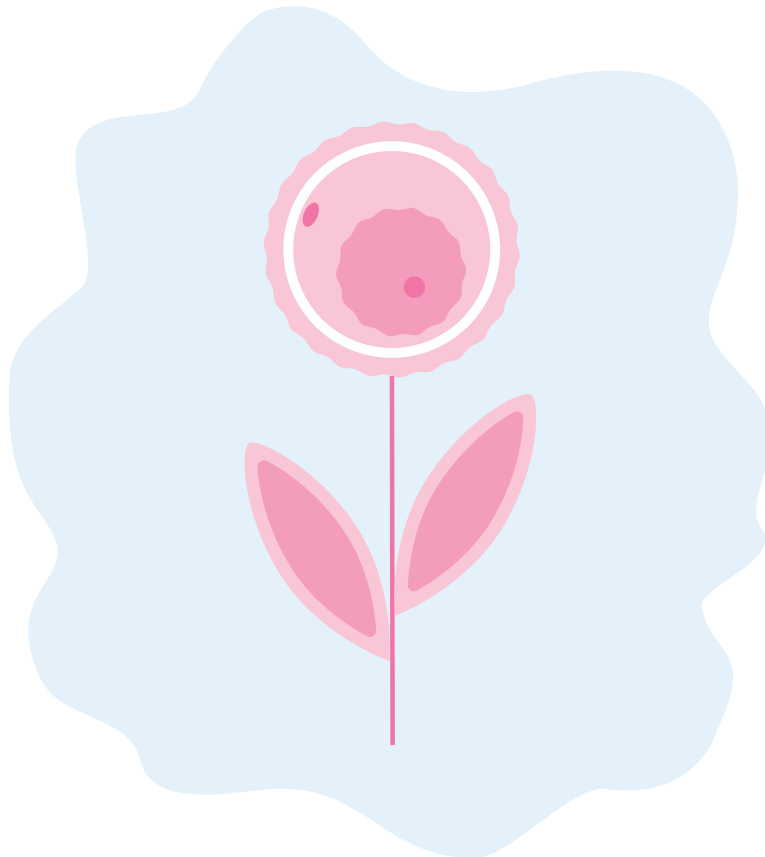
overwhelming lack of attention.

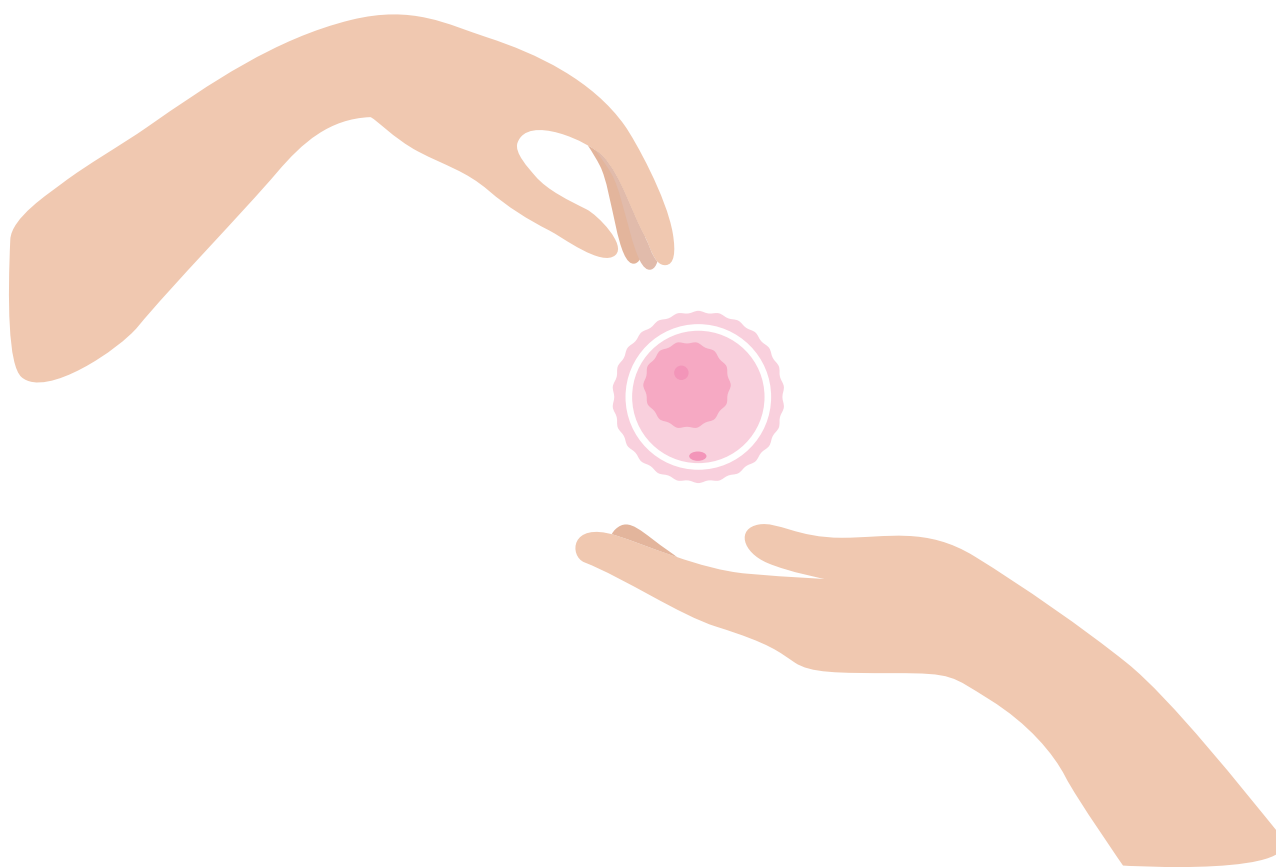
The right of reproduction receives so little attention, in fact, that other than personal stories and anecdotal evidence, there is no real data in the United States to offer an accurate picture of egg donor race or ethnicity. Though U.S. data is lacking, a study conducted by the Human Fertility and Embryology Authority in the United Kingdom revealed that just 2.3 percent of egg donors in the U.K. in 2017 identified as Black. Even now, with the overturning of *Roe v. Wade*, not only is the right **not** to reproduce being dramatically infringed upon, but the right **to** reproduce is being threatened as well — putting both donors and recipients of eggs at risk. To BIPOC (Black, Indigenous, and people of color) individuals in this country, this assault on their reproductive freedoms is no novel occurrence, but the latest in a centuries-old onslaught.

ISOLATION

Despite the many systems of support I had, I was entirely unprepared for the feelings of isolation that came with egg donation. Whether it was someone praising me for my generosity or someone congratulating me on the sum of money I would earn, no dialogue around my experience felt right. When receiving praise, I felt almost hypocritical: *The first thing that caught my eye about donation was the financial compensation — I don't deserve any praise for my actions.* When receiving congratulations for the financial compensation, I felt belittled: *I'm doing this for so much more than money — they just don't get it.*

Other reactions to my donation





process included shock, concern for my health and well-being, and more — even the rare, confusing, and hurtful “so you’re basically going to be a parent?” comment.

I was ill-equipped with the resources and time necessary to adequately respond to each of these sentiments. Unwilling to quell the shock at my decision, unable to satisfy concerns about my well-being, and uninterested in even beginning to delve into a discussion on how far from parenthood this process made me feel, I chose not to discuss. Whether the feelings of isolation were worse when talking about it or when keeping to myself I cannot say, but I never expected that in contributing to bringing another life into this world, I would feel so completely alone.

GAIN

Throughout this experience, I came to realize that while compensation may have originally caught my eye months

earlier, it was certainly not enough to keep me invested in the process. After the bloating, mood changes, and countless injections, the only thing that truly kept me dedicated to continuing the process was the thought that a recipient was relying on me to help create a family. That was enough to motivate me through the process and ultimately is the only reason I would consider donating again.

SELF

Something I have yet to discuss in this detailed sharing of my experience is how my journey impacted my identity as a medical student. Remarkably, my field of interest in medicine was wholly unaffected by the entirety of the process. That said, I did learn more about the type of physician I want to be: one who does not make assumptions about a patient’s wants and desires, one who ensures patient comfort from the first seconds of interaction, and one who encourages patient transparency through modeling it in themselves.

Outside of my identity as a medical student, I learned more about myself, my wants, and my needs through this experience than I ever thought I would. I was able to institute changes and safeguards to protect my mental health that I had never thought of before, and for the first time in a long time was able to prioritize myself and my needs with what I felt to be an “acceptable” justification. I learned that my predilections around maternity, childbearing, and the meaning of family are not set in stone, but malleable ideologies that change with each new experience. I learned more about my resilience, compassion, and motivation, and started to discover myself along the way. ★

Editor’s note: This personal essay was previously published in a University of Vermont Larner College of Medicine blog post and has been reprinted here with permission from UV Larner College of Medicine.



Factitious Disorder Manifesting as Acute Tetanus

Alex Avery Powell, MD

House Officer, PGY-3
Atrium Wake Forest Baptist Health

Mary-Claire O'Brien, MD

Professor, Emergency Medicine
Professor, Social Sciences and Health Policy
Atrium Wake Forest Baptist Health

Mary Wittler, MD

Associate Professor, Emergency Medicine
Toxicologist
Atrium Wake Forest Baptist Health

INTRODUCTION

Factitious disorder is rare, difficult to diagnose, and a unique challenge for the emergency physician. A patient with factitious disorder intentionally manifests physical symptoms of disease without clear gain and often is willing to undergo invasive procedures.¹

Unrecognized factitious disorder is harmful to our patients and places a large burden on hospital systems, in addition to contributing to physician burnout.² The electronic medical record (EMR) may create a misplaced sense of security in health care providers as it engenders the false belief of completeness of information and infallibility.

We present a case of factitious disorder manifesting as acute tetanus, which to the authors' knowledge has not been previously described in English publications but may be more recognized in other countries.^{3,4}

CASE

A young male in his early 30s presented to the emergency department unaccompanied, complaining of severe muscle spasms. The patient reported that approximately seven days ago he had stepped on a rusty nail in a horse barn. Several days after that incident, he developed severe cramping and spasms in his bilateral lower extremities

that progressed to include his upper extremities and face. He reported that he had been drinking from a straw for the past three days due to being unable to open his mouth fully. He stated that he received no vaccinations as a child due to his parents' religious beliefs and, specifically, that he was unvaccinated against tetanus.

On initial exam, the patient was in acute distress, exhibiting significant flexion of his toes and lower extremities. He was tachycardic to 130, frequently grimacing and arching his back. He had a healed laceration to the bottom of his left foot. Our patient appeared to exhibit risus sardonicus and severe

muscle spasms concerning for acute tetanus. Toxicology was consulted in the emergency department. The patient was given tetanus immunoglobulin, Tdap, and IV metronidazole. He was given high doses of diazepam and opioids and admitted to the intensive care unit (ICU).

While in the ICU, the patient underwent central line placement and received escalating doses of opioids and benzodiazepines, as well as a magnesium infusion. His foot was debrided in the operating room by podiatry. Our patient continued to receive patient-controlled analgesia and scheduled benzodiazepines. He was visited by caseworkers multiple times; they were never able to reach the patient's significant other or verify the financial information he provided.

Conflicting documentation began to emerge during the patient's hospitalization. A nutrition consult noted him to be eating a steak dinner brought from outside the hospital. A resident note from later that same day recorded him unable to speak clearly due to muscle spasms in his back and trismus. He was also found to be somnolent at several points during his hospitalization.

The patient's care was downgraded after 48 hours in the ICU.

On hospital day 8, a code stroke was called due to a new left facial droop. Neurology evaluated the patient and did not appreciate any focal neurologic deficits. Following this code stroke, the patient experienced worsening spasms that were refractory to benzodiazepines. Neurosurgery was consulted and offered the patient a lumbar drain for intrathecal baclofen. Critical care was consulted to offer the patient paralysis and intubation. The patient declined intubation. Despite nothing by mouth (NPO) status, the patient was found eating and laughing with a friend in the room and threatened to leave against medical advice (AMA) when confronted.

On hospital day 9, toxicology discovered that the patient had checked in to multiple regional hospitals and another hospital in a different state under a different alias, also complaining of spasms concerning for acute tetanus. On discovery of the patient's accurate

identity, we were able to see in the EMR that the patient had been seen twice in 2015 (once at our hospital) and once in 2016 at another institution for "acute tetanus." He had been intubated for tetanus in the past. He had also presented to multiple hospitals in the past six years complaining of headache, fever, and neck pain and had undergone lumbar punctures and prolonged antibiotics due to concern for meningitis. When the inpatient team discussed this with the patient, he left AMA despite the inpatient team strongly recommending he stay in the hospital to be weaned off his high doses of benzodiazepines and opioids.

DISCUSSION

Our patient exhibited several symptoms and signs that have been associated with factitious disorder.⁵ He presented to the ED alone and did not provide reliable contact information for friends or family for collateral information. He had a variable severity of symptoms documented by different members of his care team. When our toxicologist eventually uncovered the patient's identity through collaboration with regional toxicologists, it became clear

our patient had a severe case of factitious disorder. He demonstrated a willingness to undergo invasive procedures, including intubation and central line placement for factitious tetanus as well as lumbar puncture and multiple weeks of antibiotics for factitious meningitis.

CONCLUSION

Our case highlights the importance of recognizing factitious disorder as early as possible and connecting these patients with appropriate resources, as even specialists have difficulty diagnosing and managing this condition.⁵⁻⁷ Our patient had nine different subspecialty consultations while admitted during this course of factitious tetanus. Undiagnosed factitious disorder is a tremendous burden on our already strained health care system and exposes our patients to unnecessary invasive procedures fraught with risk. This case also demonstrates the fallibility of the EMR — something rarely considered in this era as the EMR becomes more prevalent and our systems more connected.

A high index of suspicion and repetitive examination of assumptions are critical to successful diagnosis and management of factitious disorder. ★





A Rare Case: Atraumatic, Anterior Segment Ophthalmologic Hemorrhage Requiring Anticoagulation Reversal

Elijah Abramson, MD

Resident, PGY-3
Emergency Medicine
NewYork-Presbyterian Brooklyn
Methodist Hospital

Darius Felton, MD

Assistant Professor
Emergency Medicine
NewYork-Presbyterian Brooklyn
Methodist Hospital

Solly Elmann, MD, FACS

Assistant Professor
Ophthalmology
NewYork-Presbyterian Brooklyn
Methodist Hospital

Theodore Gaeta, DO, MPH, FACEP

Program Director
Emergency Medicine
NewYork-Presbyterian Brooklyn
Methodist Hospital

The most important mantra in the ED is: Perform resuscitative efforts to reverse threats to “life, limb, or eye.” As it pertains to supratherapeutic INR reversal in the setting of anticoagulation, emergency physicians are most familiar with reversing anticoagulation due to warfarin in the setting of life-threatening trauma

or intracranial hemorrhage.^{5,6} There are, however, less documented reports of atraumatic ophthalmologic hemorrhage due to excessive anticoagulation.

The incidence of clinically insignificant subconjunctival hemorrhage in warfarin use is approximately 1 percent.^{2,4} To date, we have found only one case of spontaneous subconjunctival

hemorrhage (SCH) requiring emergent anticoagulation reversal with intravenous vitamin K.³ More recently, in June 2021, there was a report of warfarin-associated SCH without supratherapeutic INR.¹

This case appears to be the first documented case of supratherapeutic INR causing SCH and anterior segment ophthalmologic hemorrhage requiring

Warfarin-induced spontaneous subconjunctival hemorrhage has been identified in the literature. Clinical judgment should guide emergent reversal of potentially sight-threatening ophthalmologic hemorrhage due to anticoagulation with prothrombin complex concentrate.

emergent anticoagulation reversal with vitamin K and prothrombin complex concentrate. Thus, this report adds to the literature of diagnostic consideration that may require aggressive management when presented with atraumatic, frank ophthalmologic hemorrhage.

CASE REPORT

A 96-year-old woman with a past medical history of deep venous thrombosis and pulmonary embolism on warfarin presented to our ED with a spontaneous left eye bleed. A family member reported the bleeding began two days prior and was associated with decreased vision. The patient, who was living independently, refused to seek care until her family member visited her on the day of her presentation and determined the frank bleeding required immediate care. The patient reported she took her medications as prescribed. She denied dizziness, lightheadedness, and syncope.

Vital signs were remarkable for a blood pressure of 89/53 mmHg with a normal heart rate. Left periorbital ecchymosis was noted. The patient refused to fully cooperate with visual acuity (VA) assessment in the right eye but was able to count fingers. Left-eye VA was to hand motion. Extraocular movements were intact in both eyes. Pupils constricted bilaterally, but there was a relative afferent pupillary defect in the left eye. Mild chemosis, as well as severe subconjunctival hemorrhage of the inferior aspect on the left, was noted. There was no proptosis. Bedside ocular sonography did not reveal

a vitreous hemorrhage or retinal detachment.

Pertinent initial diagnostic studies included a complete blood count (CBC), coagulation profile, and immediate computed tomography (CT) scans with and without contrast of the orbit. An emergent ophthalmologic consultation was placed. The initial hemoglobin was 8.3, a three-point drop since the last in-house hemoglobin, which was about two years prior. Initial PT was over the threshold of detection (150), and thus the INR could not be calculated. Ophthalmology was consulted, and the patient was diagnosed with a severe left anterior segment hemorrhage, which may have required surgical exploration. Her pressure was repeated without

crystalloid or colloid administration and found to be 127/56 mmHg.

Repeat coagulation profile after administration of vitamin K revealed PT 145, just under the threshold of detection, and calculated INR of 12.6. The patient continued to have extravasation of blood from the eye that was temporized with manual pressure. She maintained a normal heart rate and blood pressure.

Prothrombin complex concentrate (PCC) was given. Repeat studies showed PT 16.6 and INR 1.43. Transfer to a nearby tertiary center for further ophthalmologic monitoring and assessment was arranged. Within one hour of administration of PCC, the ophthalmologic hemorrhage ceased. The patient transfer was uneventful.



IMAGE 1: Left eye with mild chemosis and subconjunctival hemorrhage over the inferior aspect without proptosis

DISCUSSION

Warfarin-induced SCH has been identified in the literature, and clinical judgment should guide emergent reversal of potentially sight-threatening ophthalmologic hemorrhage due to anticoagulation with PCC. Our patient's vision was at baseline after anticoagulation reversal. It was also unclear whether the three-point decrease in hemoglobin was due to the acute hemorrhage or had been a more chronic process since the prior measurement observed during chart review was taken years prior. Ultimately, warfarin reversal was sufficient to reverse ophthalmologic bleeding, and no further surgical exploration or intervention was necessary. The patient also did not suffer from prothrombotic consequences of the reversal. ★

Chart Review: Early Presentation After Neodymium Magnet Ingestion Associated With Decreased Morbidity in Pediatric Patients

Anna Reviere, BS

Medical Student
University of New Mexico
School of Medicine

Ricardo Falcon, MD

Anesthesiology & Critical
Care Medicine
University of New Mexico
School of Medicine

Christopher Root, MD

Emergency Medicine
University of New Mexico
School of Medicine

Richard Lock, MD

Anesthesiology & Critical
Care Medicine
University of New Mexico
School of Medicine

Jason Mckee, MD

Department of Surgery
Division of Pediatric
Surgery
University of New Mexico
School of Medicine

David Lemon, MD

Department of Surgery
Division of Pediatric
Surgery
University of New Mexico
School of Medicine

Pankaj Vohra, MD

Department of Pediatrics
Division of
Gastroenterology
University of New Mexico
School of Medicine

Razan Alkhouri, MD

Department of Pediatrics
Division of
Gastroenterology
University of New Mexico
School of Medicine

Timothy R. Petersen, PhD

Anesthesiology & Critical
Care Medicine
University of New Mexico
School of Medicine

Codruta Soneru, MD

Anesthesiology & Critical
Care Medicine
University of New Mexico
School of Medicine

ABSTRACT

Neodymium magnet ingestion poses an emergency, but treatment delay has unknown effects. We evaluated this and other factors' effects on outcomes at our institution.

Early presentation and gastric location indicate endoscopy, but symptoms or lack of movement on serial X-rays indicate surgery; free air or obstruction indicate emergent surgery. Moving magnets can be "assisted" with polyethylene glycol, which may facilitate colonoscopy if warranted.

We found much variability but little relationship between esophagogastroduodenoscopy (EGD) timing and success.

Early presenters (≤ 10 h) avoided invasive procedures and complications. All complications occurred in patients with later intervention. Early hospital presentation may be associated with better outcomes.

INTRODUCTION

Pediatric ingestion of foreign objects is a common occurrence. In 2016, there were more than 80,000 reported cases in the United States, primarily involving children under 5 years.¹

Ingestion of small blunt objects typically resolves without medical intervention. However, cases involving ingestion of magnets have been shown to

present increased risk of life-threatening morbidity,²⁻⁵ particularly if more than one is ingested.³ Despite regulatory efforts, the incidence of emergency department visits for magnet ingestion in pediatric patients increased 8.5-fold from 2002 to 2011, even with evidence of under-reporting.³

Rare earth metal (neodymium) magnets are common in household objects, including toys. These magnets are often small, but considerably stronger than common "refrigerator magnets," increasing both the risk of attraction across multiple tissue layers and the objects' resistance to being separated by peristaltic activity,⁴ eventually leading to pressure necrosis and perforation. Other clinical sequelae include ulcer, bleeding, bowel obstruction, fistula, volvulus, sepsis, and bowel resection.²

While published guidelines for magnet-ingestion management exist,⁵ the relationship of elapsed ingestion-treatment time with success of EGD versus requirement for laparotomy has received less attention. We aimed to assess whether delay may affect the success of this technique.

MATERIALS AND METHODS

After approval by the Human Research Review Committee at the University of New Mexico Health Sciences Center, we conducted a retrospective chart review

of all endoscopies and exploratory laparotomies for foreign body ingestions at our institution from January 2012 to October 2020. We reviewed all pediatric cases involving ingested magnets to assess any association between the ingestion-intervention interval and morbidity. We excluded cases involving patients over age 18, foreign bodies other than magnets, and ingestions of a single magnet without additional ferromagnetic objects.

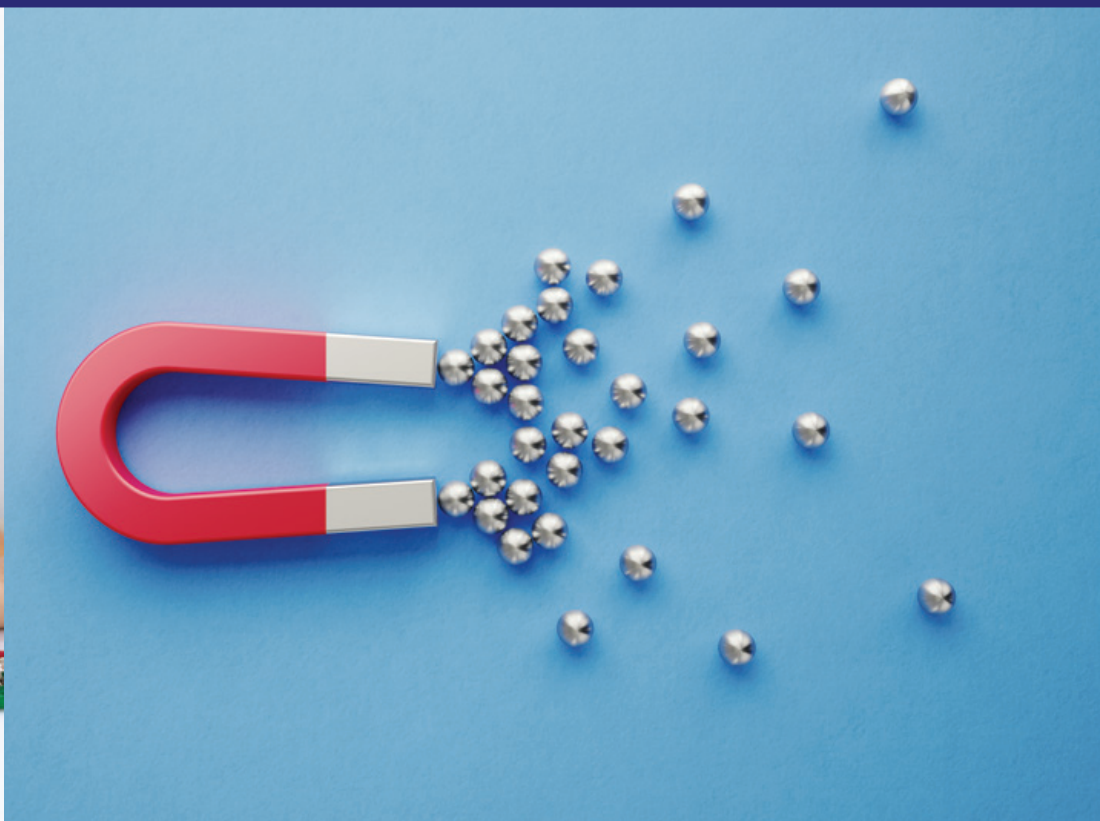
RESULTS

We identified 22 cases meeting our criteria. Removal procedures included 10 EGDs, seven colonoscopies, and nine diagnostic laparoscopies and exploratory laparotomies; four patients underwent more than one procedure.

The average observed ingestion-procedure intervals for specific outcomes are:

- Successful removal with EGD — 6.5 hours
- Magnets beyond EGD reach — 5.5 hours
- Colonoscopy — 3 days
- Diagnostic laparoscopy/exploratory laparotomy — 6 days

Adverse outcomes we observed included: esophageal perforation; ileocectomy with ileal appendiceal fistula; multiple bowel perforations; partial thickness necrosis on small



bowel; and partial cecectomy with appendectomy.

DISCUSSION

Time interval between ingestion and successful endoscopic removal of magnets varied significantly. The promptness of EGD did not predictably affect its success. When EGD was attempted, average ingestion-procedure intervals were shorter for cases in which the magnets had already passed the stomach and duodenum (5.5 hours) than for those in which EGD successfully retrieved the magnets (6.5 hours), although this difference was not statistically significant. Possible reasons for this paradox are inaccurate reporting of the time the magnets were swallowed and variability in gastric motility and emptying from patient to patient. The timing of magnets exiting the stomach appeared to be highly variable; in one patient, this occurred within 3 hours.

Every unsuccessful EGD case in our sample had good outcomes. Patients were followed with serial X-rays and treated with laxatives, either passing the magnets in stool (though we only observed this in patients over age 10) or

undergoing removal with colonoscopy. These good outcomes despite EGD retrieval failure represent a selection effect; EGD was only considered with early presentation.

Regardless of EGD success, all patients who presented early (within ~10 hours) avoided invasive procedures such as exploratory laparotomy and had no complications. This supports the conclusion that prompt hospital care is associated with better outcomes and decreased morbidity.⁴ All serious morbidity in our series occurred in patients with interventions occurring 20 hours to one month after ingestion.

One caveat is the reliability of self-reporting by caregivers. Ingestion time may be estimated, such as when the event was not directly observed, or there was a delay in seeking hospital care. However, the distinction between short- and long-interval cases is likely reliable. Another caveat is that our experience is limited; early presentation can only reduce morbidity and/or the need for surgical interventions; it cannot prevent them entirely.

If presentation is early and X-ray shows all magnets in the stomach,

endoscopic removal is preferred. If magnets have passed the stomach and are clustered together, a short observation period with laxative administration is warranted. Magnets moving on serial X-rays can be followed until they pass.

Colonoscopy-preparation solution (e.g., polyethylene glycol) may help magnets move and can facilitate later colonoscopy if they stop distally. If magnets stop moving or any symptoms develop, immediate intervention (colonoscopy or surgery) is necessary. It is important to note that symptoms may be subtle but include pain, fever, and vomiting.⁵ If X-ray shows free air or obstruction, surgery is needed emergently.

Given the severity of possible outcomes with delayed presentation and apparent benefits of prompt presentation, we recommend counseling caregivers to seek medical care urgently when magnet ingestion is known or suspected. ★

Conflict of Interest Statement: The authors have no relevant financial or non-financial interests to disclose.

Buprenorphine-Naloxone Initiation in a New York City ED: Interview With a Frontline Provider

An Emergency Department in Queens Responds to the Opioid Epidemic

Georgianna Stoukides, MA

Medical Student, MS-4
New York Institute of Technology College of Osteopathic Medicine

Anthony Almeida, DO

Attending Physician
Jamaica Hospital Medical Center, New York

In the heart of Queens, NY, in one of the most ethnically diverse counties in the world, exists an emergency department of a safety-net hospital and Level I trauma center: the Jamaica Hospital Medical Center ED.

Anthony Almeida, DO, an emergency medicine attending physician there, is responding to a young patient who has come in with severe opioid withdrawal symptoms. Holding her abdomen, pale and fatigued, she explains her story to Dr. Almeida, who calms her and assures he will help her feel better. He then goes back to his desk, and as he is inputting his notes into the EMR, I see a laminated sheet on his desk, reading “Suboxone Initiation Protocol in the ED.”

In 2020, drug overdose deaths in the United States reached 93,331, a 30 percent increase from 2019 and the highest single-year increase recorded.¹ In 2021, the total number of drug overdose deaths in the United States reached a record of 107,622.²

According to the New York State Department of Health 2022 Report on Opioid-Related Deaths, 12 New York residents died every day during 2020 from an opioid overdose.³ Also that year, New York City boroughs were among the highest in opioid overdose ED visits and naloxone administrations by EMS.³

These trends in overdose deaths have accompanied the growing use of fentanyl, a potent synthetic opioid, which is now

more often mixed with stimulants like cocaine and methamphetamine.^{4,5}

Dr. Almeida, who has been working at the Jamaica Hospital ED since 2019, completed his training in emergency medicine at the New York Medical College-Metropolitan/Harlem residency program in Manhattan.

“Where I trained, I used to encounter opioid use and overdoses in the community all the time,” he says. “Since then, I have been interested in helping people manage their pain, and for me, opioid harm reduction is just the natural next step.”

In 2021, a group of emergency physicians at Jamaica Hospital, led by Melvin Ku, MD, developed the hospital’s buprenorphine-naloxone initiation protocol. Dr. Almeida explains that with this protocol, emergency physicians address patients’ withdrawal symptoms and begin the conversation of buprenorphine-naloxone treatment for opioid use disorder (OUD). Once buprenorphine-naloxone treatment is initiated, the ED provides a three-day supply of the medication and creates follow-up at the outpatient clinic of the hospital for further management.

INITIATING MEDICATION-ASSISTED TREATMENT IN THE ED

Emergency departments play a key role in addressing the opioid epidemic. As the ED is very often the first point of entry into the health care system for people who use opioids, emergency physicians have the unique opportunity to introduce patients to medication-assisted treatment (MAT) for OUD and significantly impact their addiction



JAMAICA HOSPITAL MEDICAL CENTER



ROAD TO RECOVERY

management.⁶ The initiation of MAT in the ED has been shown to significantly decrease mortality within a year of treatment.⁷ Previous research suggests that initiating MAT in the ED can be cost-effective and may increase the 30-day treatment engagement rates compared to just standard referral.⁸

Several EDs in the country have been using MAT initiation protocols for OUD, specifically buprenorphine protocols.⁶ Dr. Almeida explains that Jamaica Hospital uses buprenorphine-naloxone (brand name: Suboxone®) for its MAT protocol, citing its “decreased potential for abuse, compared to buprenorphine alone.”

Suboxone®, one of the available brand-name medications, is composed of buprenorphine and naloxone and has been approved as a safe and effective

MAT for opioid addiction, especially when combined with counseling and behavioral therapy.⁹ Buprenorphine is an FDA-approved partial opioid agonist that decreases the effects of euphoria and respiratory depression caused by opioids, while also diminishing the symptoms of physical dependency and cravings caused by opioid withdrawal. Naloxone is an FDA-approved opioid antagonist that completely blocks the effects of opioids and can rapidly reverse opioid overdose.¹⁰ Suboxone® carries the beneficial effects of buprenorphine, while the naloxone component decreases the likelihood of misusing the medication.

THE ED AS A LINK TO OUD TREATMENT AND CARE

When asked about the success of initiating buprenorphine-naloxone

treatment in the ED among patients with OUD, Dr. Almeida says participation has been mixed.

“Getting people to start Suboxone® has been a bit difficult,” he says, “mainly because of patients’ previous experiences with the health care system, but also because of their peers’ experiences with MAT.”

What makes Jamaica Hospital unique and, ultimately, affects how the MAT program is received, is the demographic make-up of its patient population.

“It is a high-acuity hospital in a predominantly underserved area, with many patients coming to the ED to establish care,” says Dr. Almeida.

Indeed, most patients at the Jamaica Hospital ED are either uninsured or on Medicaid, and the majority are



black, South Asian, or East Asian immigrants, many of whom are undocumented. Communities of color in the U.S. historically have faced medical discrimination and intersectional/intergenerational stigmatization that their white counterparts cannot relate to.¹¹ As addiction carries a pervasive history of stigmatization, the added layer of medical racism significantly affects how people of color with a history of addiction will interact with the medical system.

Dr. Almeida adds, “Such a large proportion of patients here is underserved, and if I can help alleviate stigma surrounding opioid use and help link people to care, I am here for it.”

When asked about patient follow-up in the outpatient clinic, Dr. Almeida says it has been difficult.

He says, “Ideally, all patients started on Suboxone here in the ED will follow up with their appointments in our outpatient clinic. That hasn’t been the case, though. It’s hard — I would really want to help make that possible.”

In October 2022, only 12 people consented to receive buprenorphine-naloxone treatment in the Jamaica Hospital ED and were able to go to the outpatient clinic and continue their treatment. Dr. Almeida says that “even if the number of patients following up is small, it matters. Every one of these patients matters!”

PATIENT AND PROVIDER EDUCATION REGARDING MAT

The design of the buprenorphine-naloxone initiation protocol at Jamaica Hospital has motivated emergency physicians to become more knowledgeable and educated in the provision of MAT and the intricacies of providing for people with OUD.

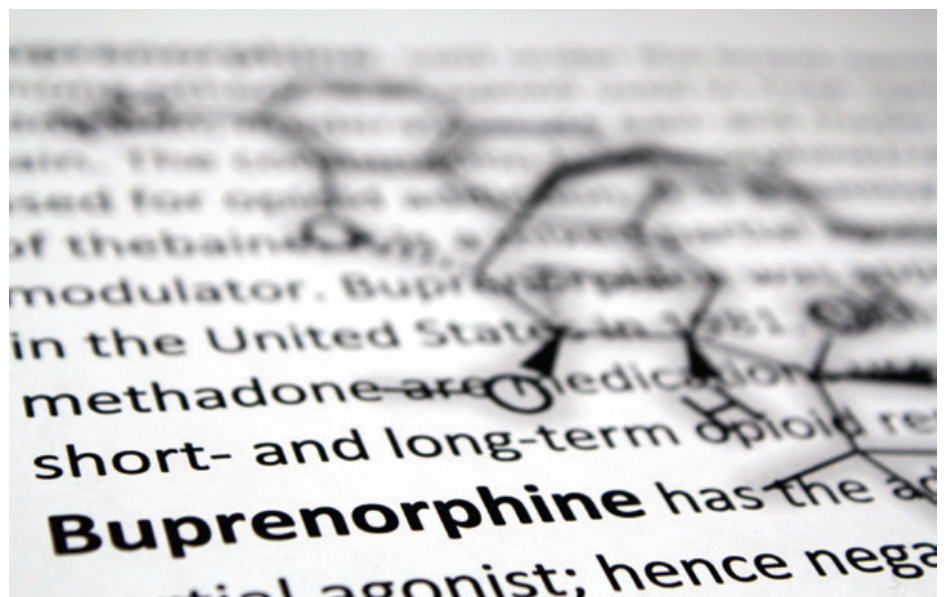
“We get the whole gamut of patients here. We help patients who have tried other programs and have been to rehabilitation or detoxification multiple times. We get a lot of people requesting Suboxone®, but we also get people who have never heard of Suboxone®

or buprenorphine, so I’m able to also educate patients right here in the ED,” says Dr. Almeida.

He and his colleagues completed the Drug Enforcement Agency’s eight-hour X-Waiver course, a former requirement for qualified practitioners to obtain and prescribe buprenorphine.¹² Dr. Almeida adds that “with this program, more ED providers are getting comfortable prescribing Suboxone® and managing patients with opioid use, which has helped get more patients educated about these harm reduction methods as well.”

Ultimately, the purpose of initiating buprenorphine-naloxone treatment in the ED is to help patients who are ready to start treatment and educate them about their options. Introducing buprenorphine-naloxone as an option in the ED while linking patients with opioid addiction to follow-up care is a significant step in destigmatizing opioid use and addiction. With such programs becoming prevalent in EDs across the nation, the nature of discussions on addiction and harm reduction is shifting, creating a more humane and patient-centered way of managing substance use.

“At the end of the day, I want to help people feel a bit better,” says Dr. Almeida. “If they are ready for Suboxone, I am grateful to help them in their journey. If they are not ready, I am here for that as well.” ★





Emergency Medicine Residents' Association

The Emergency Medicine Residents' Association is the voice of emergency medicine physicians-in-training and the future of our specialty. With a membership of over 16,000 residents, medical students, and alumni, EMRA provides a like-minded community of your peers for a lifetime!

EMRA Takes Care of You

- Bedside Resources
- Publications
- EMRA Match
- Awards
- Podcasts
- Educational Events
- Leadership Opportunities
- Scholarships

EMRA Is Your Community

- Networking
- Mentorship
- Advising
- Friendships

EMRA For a Lifetime

- Medical Students
- Residents
- Fellows
- Alumni

EMRA helps make you the best doctor you can be, the best leader you can be, and helps EM become the best specialty it can be!

#EMRAFamily





Caring for Homeless Populations in the ED: A Quick Guide

Ben Del Buono, MD

Resident, PGY-3
Emergency Medicine
Virginia Commonwealth University

Molly Curtiss, DO

Resident, PGY-1
Emergency Medicine
University of Arizona South Campus

BACKGROUND

Homelessness is defined as lacking a regular night-time residence, or having a primary night-time residence that is a temporary shelter or other place not designed for sleeping.¹ Approximately two-thirds of people experiencing homelessness are individuals, and one-third are members of families with children.² The emergency department plays a crucial role in health care for homeless populations, as it serves as the first — and often the only — resource for accessing health care in these populations.

People experiencing homelessness commonly present to the ED for health care needs. When a person newly experiences homelessness, they are nearly 25 percent more likely to present to an ED.³ In 2017, there were an estimated 990,000 ED visits by people experiencing homelessness.⁴

Additionally, increasing frequency in ED visits is associated with homelessness. From 2015 to 2018, the CDC reported about five times as many ED visits by persons experiencing homelessness compared to persons not experiencing homelessness.⁵

Interventions to address homelessness are vast and range from individual and local resources to systemic intervention and social change. According to Sadowski et al, permanent supportive housing is currently the best intervention to address frequent ED visits by individuals experiencing homelessness.⁶

RISK FACTORS/CLINICAL OUTCOMES

Homelessness is an important social determinant of health. Individuals experiencing homelessness are faced with many barriers to achieving health and wellness and frequently experience

worse health outcomes than those not experiencing homelessness.

Homelessness is associated with a worse all-cause mortality,⁷ especially in those with STEMI, cardiac arrest, and stroke.⁸ Chronic diseases — including diabetes, hypertension, asthma, infectious disease (e.g., tuberculosis, HIV, hepatitis A, and hepatitis C), depression, and substance use disorders — are more common among those newly experiencing homelessness.^{9,10} Additionally, homelessness is associated with an increased risk of premature death. The most common cause of death among patients experiencing homelessness is drug overdose (seven-fold increase compared to the general population⁷), followed by cancer and heart disease.¹¹

Patients experiencing homelessness may have difficulty storing and taking medications as prescribed due to their

housing circumstances, and many report having medications stolen in shelters or on the streets.¹² Patients experiencing homelessness are more likely to present to the ED with burns and injuries to the lower extremities, and to have more severe injury patterns and longer injury-related hospitalizations than patients not experiencing homelessness.¹³ According to Fazel et al, 27–52 percent of people experiencing homelessness were physically or sexually assaulted in the previous year. Nearly 10 percent of homeless women reported a sexual assault in the previous year.¹⁴

BEDSIDE AWARENESS

As emergency physicians, we are charged with caring for patients experiencing homelessness frequently throughout our careers, and it is imperative that we are well-informed and equipped to care for both their medical and social needs. Given the emergency physician's unique opportunity to care for individuals experiencing homelessness, we have a responsibility to consider the barriers and challenges that individuals experiencing homelessness face during our care for these patients.

As emergency physicians, we can help reconcile health inequities at the bedside for individuals experiencing homelessness by:

- Treating all patients with the same level of respect and open-mindedness
- Routinely screening for homelessness. Ask all patients about their housing status as part of the social history. Many patients experiencing homelessness will not fit the stereotypical profile. Consider asking¹⁵:
 - Where do you live?
 - Where are you staying these days?
 - Have you ever had nowhere to stay for the night?
- Documenting homelessness in the social history, beyond mentioning it in a single note
- Not inserting “homelessness” as a chief complaint, as this may mask comorbid health conditions and introduce bias¹⁵
- Considering a history of homelessness and associated risk factors throughout the patient interview, in the context of

the review of systems, and when performing a physical exam

- Allowing for a broad differential diagnosis that reflects the high morbidity and mortality burden faced by this population, including (but not limited to) issues such as cardiac disease, stroke, hypertension, diabetes, infectious diseases, mental health disorders, and substance use disorders

KEY ACTIONS

As emergency physicians, we can address these social/structural determinants of health by:

- Linking individuals experiencing homelessness to available community resources, as EDs represent a critical setting for encountering homelessness and assisting individuals in finding help^{16,17}
- Addressing immediate needs. Although some basic necessities, such as food and clothing, are not typically thought of as medical care, they are nevertheless critical to human survival and compassionate patient care.¹⁵
- Social Work:
 - Know your ED's social workers, their hours of operation, and the different ways in which they can help. Engage social work early when necessary, especially for patients who utilize the ED often.
 - Know your community housing resources. Be ready to provide at least one referral source for shelter or housing assistance.
- Discharge:
 - Consider whether activity restrictions are needed. Most homeless shelters do not allow patients to rest inside during the day. Supportive care measures such as extremity elevation can be difficult in a shelter and impossible on the street.¹⁵
 - If you're discharging a patient with



a contagious infectious disease, consider how this will affect their eligibility to stay in a shelter. This is particularly relevant to the COVID-19 pandemic.

- Medication Prescriptions:
 - Consider medication cost and accessibility to outpatient pharmacies.
 - Patients may not have access to refrigeration, which is problematic for certain medications such as insulin.
 - Consider the complexity of medication dosing schedules, and opt for single-dose treatments when feasible (e.g., consider single-dose dexamethasone injection rather than steroid dose pack prescriptions for asthma).¹⁵ ★

This article is part of an EMRA Social EM Committee initiative to disseminate information about social EM topics encountered in the emergency department. More information can be found in the EMRA MobileEM app's Patient Conversation Toolkit, available for download via iTunes and Google Play.



Caring for Immigrants in the ED: A Quick Guide

Molly Curtiss, DO

Resident, PGY-1
Emergency Medicine
University of Arizona South Campus

Carolina Ornelas-Dorian, MD, MPH

Resident, PGY-2
Emergency Medicine
University of California San Francisco

Tuong Pham, MD

Resident, PGY-3
Emergency Medicine
Valley Health System

BACKGROUND

The emergency department is an important source of health care for immigrants and refugees/asylum seekers.^{1,2} Since the passing of the Emergency Medical Treatment and Labor Act (EMTALA), the ED has functioned as the health care safety net for immigrants, especially undocumented immigrants.³ As immigration and immigration status greatly affect behavioral choices surrounding health care, emergency physicians must observe unique considerations when caring and advocating for this population.

In 2020, there were 22.1 million

non-citizens in the United States.⁴ This included refugees/asylum seekers (individuals forced to flee due to persecution, war, or violence); visa holders (individuals with visas based on employment, family status, trafficking victim status [T visa], and crime victim/witness status [U visas]); and undocumented individuals.⁵ About four in 10 non-citizens were undocumented immigrants, making up approximately 3 percent of the U.S. population.⁴

RISK FACTORS/CLINICAL OUTCOMES

Immigration and immigration status are important social and structural determinants of health.⁶ Undocumented

individuals are more likely to live below the federal poverty level, have poor English proficiency, and have not completed high school.² Non-citizens are also significantly more likely than citizens to be uninsured and less likely to have a primary care physician or health care access in general.^{4,7,8}

After the Affordable Care Act (ACA), one in five immigrants remains uninsured.⁹ Contributing barriers to insurance enrollment include fear, confusion about eligibility policies, difficulty navigating the enrollment process, language and literacy challenges, and the exclusion of undocumented immigrants from

federal insurance options and the ACA marketplace.⁴ Despite the fact that the majority of undocumented immigrants are employed, they remain uninsured due to the lack of financial resources to purchase private insurance or are employed in jobs that do not provide insurance.¹

These social and structural determinants of health perpetuate health and health care inequities among immigrant populations. For example, the stress of living as an immigrant has been associated with adverse outcomes, including low birth weights and increased risk for mental health conditions such as depression and anxiety.¹¹ Undocumented Latino persons with HIV infection entered care with more advanced disease compared to documented persons, in the setting of reduced access to medical care and preventative health.¹² In 40 of the 50 U.S. states, scheduled dialysis is withheld from undocumented immigrants with end-stage renal disease, leaving emergency-only dialysis as the only option for many. Compared with emergency-only dialysis, scheduled dialysis was associated with reduced mortality, health care utilization, and health care costs.¹³

BEDSIDE AWARENESS

EMTALA allows for all patients, regardless of factors such as immigration or insurance status, to be evaluated in the ED.¹¹ However, undocumented immigrants note

significant barriers in presenting to the ED largely due to fear of discovery and deportation. Approximately half stated that this fear caused them to delay coming to the ED (with a median delay of two to three days).^{1,14} Given EM's crucial role in caring for immigrant populations, it is important that emergency physicians ensure patients feel safe in the ED and address any fears in accessing care. Patients need to feel that EM providers are concerned with their health and safety regardless of immigration status or cultural differences.

As emergency physicians, we can help mediate fear and health inequities for immigrants at the bedside by:

- Not making assumptions on who is or is not an immigrant
- Not asking directly about patient immigration status (to not increase fear and mistrust)
- If immigration status comes up, reassuring patients that this

confidential, HIPAA-protected information will not be shared or reported

- Asking if the patient or anyone in their family/community would be interested in further immigration resources (e.g., medical-legal partnerships)
- Identifying language barriers and using professional interpreters
- Recognizing that immigrants are vulnerable to exploitation, including labor and sex trafficking, and maintain a high degree of suspicion.

This article is part of an EMRA Social EM Committee initiative to disseminate information about social EM topics encountered in the emergency department. More information can be found in the EMRA MobileEM app's Patient Conversation Toolkit, available for download via iTunes and Google Play.



KEY ACTIONS

As emergency physicians, we can address these social/structural determinants of health by:

- Educating individuals in health care and policymakers about the social and structural determinants of health and inequities impacting immigrant populations
- Avoiding documenting patient immigration status in the medical chart in order to reduce stigmatization, discrimination, and unintentional exposure¹⁵; if necessary, using general terms like “immigration-related stressors”
- Supporting and developing medical-legal partnerships and accessible social resources (e.g., housing, food, health insurance, immigration relief) for all patients regardless of immigration status²
- Developing an ED workflow for immigration enforcement situations in your clinical environment (e.g., identifying a response team with individuals knowledgeable in warrants and subpoenas to ensure immigrants' medical-legal rights and protections are enforced)¹¹ ★

Experimental Curriculum: Team-Based Learning for New AMA Charting and Coding Guidelines

Anisha Turner, MD
Department of Emergency Medicine
Baylor College of Medicine

Allison Haddock, MD, FACEP
Department of Emergency Medicine
Baylor College of Medicine

Emily Hirsh, MD
Department of Emergency Medicine
Emory University

Richina Bicette, MD
Department of Emergency Medicine
Baylor College of Medicine

Sara Andrabi, MD
Department of Emergency Medicine
Baylor College of Medicine

ACKNOWLEDGEMENTS

Stan Wu, MD
Department of Emergency Medicine
Baylor College of Medicine

Theresa Tran, MD
Department of Emergency Medicine
University of Texas Health Houston

Cedric Dark, MD, MPH, FACEP
Department of Emergency Medicine
Baylor College of Medicine

Tyson Pillow, MD
Department of Emergency Medicine
Baylor College of Medicine

The American Medical Association Revisions to the Current Procedural Terminology (CPT) codes for evaluation and management (E/M) kicked into effect this year for emergency department E/M services, making it paramount that residents apply the new guidelines when writing the medical decision-making portion of their charts.

Several associations, including ACEP, have offered various educational modalities including webinars and conferences, but it is of utmost importance that EM residency programs continually incorporate charting and coding education in their own curricula

for new residents. A pedagogical modality that we encourage is team-based learning (TBL) offering emergency department case studies to illustrate the new documentation guidelines.

Our curriculum was delivered at one academic institution’s EM residency program, with 31 residents and 18 faculty and APP learners attending a TBL reimbursement workshop. Response to the exercise was overwhelmingly positive, with participants showing an increase in comfort with understanding and placing the six different E/M Current Procedural Terminology codes commonly used in emergency medicine.

The Accreditation Council for

Graduate Medical Education (ACGME) has recognized the importance of residents understanding charting and coding by promoting educational activities involving charting and coding in the core competency system-based practice (SBP).¹ Competency in SBP requires that residents “demonstrate an awareness of and a responsiveness to the larger context and system of health care.”²

Despite this including charting and coding skills, numerous studies suggest a need for improved education in the area, with one study showing that only 15 percent of residents understand what an E/M code is and 74 percent feel they

TABLE 1: Charting and Coding Curriculum Development Using Kern’s 6-Step Framework

Kern’s 6-Step Framework	Charting and Coding Curriculum
1. Problem identification and general needs assessment	<ul style="list-style-type: none"> Literature describing the best methods for training residents in this area is lacking Based upon results of a few studies,^{3,6,7} charting and coding education during residency is well received and has the potential to improve confidence and performance
2. Targeted needs assessment	<ul style="list-style-type: none"> No formal training using TBL has been published for emergency medicine trainees Society of Academic Emergency Medicine and American Board of Emergency Medicine identify charting and coding as an area of improvement
3. Goals and objectives	<ul style="list-style-type: none"> Residents will describe the required elements to bill for the 6 major evaluation and management Current Procedural Terminology (CPT) codes for emergency medicine Residents will distinguish between the current payment system and newer payment modes Residents will propose billing charges of patient encounters.
4. Educational strategies	<ul style="list-style-type: none"> Team-based learning strategies
5. Implementation	<ul style="list-style-type: none"> Pre-curriculum survey to assess baseline comfort Residents will have 1 week to review the educational content at their own pace Delivery of curriculum Post-curriculum survey will include feedback
6. Evaluating the effectiveness of the curriculum	<ul style="list-style-type: none"> Evaluation of the immediate effect on improving skills will occur with a 1 week of session

did not receive adequate education in charting and coding skills during residency.^{2,3,4,5}

While institutions have used multiple pedagogical approaches, the best method for teaching charting and coding is not clear.^{6,7}

To address the lack of a standardized charting and coding educational method at our institution, we incorporated charting and coding skills as part of our health policy curriculum. We used Kern’s 6-step approach to curriculum development, widely applied to multiple specialties and training within medical education, as we created a curriculum template for teaching the necessary charting and coding skills.^{8,9}

Table 1 summarizes Kern’s framework, outlines key aspects of our curricular design, and includes supporting educational evidence.

Due to restrictions secondary to the COVID-19 pandemic, all residency didactic sessions were conducted virtually in 2020 when the original

version of our TBL reimbursement exercise was conducted. We are currently swapping the content to teach the new 2023 documentation guidelines; however, the format remains identical to what we describe below. We dedicated 3 hours of didactic time for the Zoom® workshop. Learners were divided into heterogeneous 4- to 6-member teams incorporating learning at all levels of training into each group. EM faculty members either served as facilitators or observed and shared input.

In preparation for the TBL session, faculty members selected a preparatory charting and coding document and developed the curricular readiness assurance test consisting of 8 multiple-choice style questions (Appendix A). Prior to the TBL sessions, residents were expected to read the preparatory document (Appendix B) and complete a pre-curriculum survey. The preparatory document was freely available.

Each resident then participated in the TBL activity outlined in **Table 2**.

The sessions included the 7 key TBL elements according to Haidet et al and were conducted using the standard TBL structure.¹⁰

IMMEDIATE FEEDBACK

Faculty members provided immediate feedback after the group readiness assurance test to reinforce baseline knowledge and clarify discrepancies or misunderstandings. Answers to the readiness assurance test are included in Appendix C. A facilitator was also available for immediate feedback and clarification during each case-based discussion.

TEAM APPLICATION ACTIVITIES

To develop team application activities, faculty members submitted de-identified cases that were used for case-based discussion during the traditional TBL small-group sessions (Appendix D) accompanied by small-group exercise tasks (Appendix E). Session materials are available in the appendix section. The

TABLE 2: Session Timeline

TBL Component	Content	Description	Format	Planned Time
Pre-work	Preparatory document about topic distributed to residents via email		Online/Remote Learning	Outside of session
Introduction		Zoom opens, session begins, expectations set	Plenary	15 minutes
Readiness Assurance Test (RAT)				
IRAT	8 multiple choice style questions completed individually	Individual readiness assurance test (8 questions)	Individual	15 minutes
GRAT	Same questions completed by teams in breakout rooms	Break out into teams Team introductions Team Readiness Assurance Test	Break out rooms	20 minutes
Discussion	Teams share their answers (“report out”), followed by large group discussion of each answer; repeat for each question	Clarifications of IRAT/TRAT answers	Plenary	20 minutes
		Break	Break	10 minutes
Application exercise				
Team	Teams work on the same cases concurrently	Application cases in Batch 1	Break out rooms	35 minutes
Discussion	Teams simultaneously shared solution, followed by large group discussion for each case; repeated for each case	Application discussion 1	Plenary	15 minutes
		Application cases in Batch 2	Break out rooms	35 minutes
		Application discussion 2	Plenary	15 minutes
		Break	Break	10 minutes
Conclusion	Facilitators summarize key points and conclude session	Closing	Plenary	20 minutes

small-group exercise tasks met the 4S criteria (i.e., significant problem, same problem, specific choice, simultaneous reporting) of a typical TBL: Teams worked on the same significant problem and selected specific choices simultaneously.^{11, 12}

There were 4 sample charts, and each was accompanied by an exercise task consisting of 8 multiple-choice options for each question. Teams were instructed that there was one correct answer for each, which encouraged commitment to an answer choice. Teams moved through one vignette at the same time. Approximately 10 minutes per case were allowed to debate answers within teams, after which each team committed to an answer that was discussed with the facilitator. The facilitator then spent 5 minutes probing the team to highlight important and salient points in the cases. Then the correct answer was revealed and discussed. Answers to the small-group cases and exercises are included in Appendix F and Appendix G, respectively.

FACILITATION SCHEMA

EVALUATION

The pre-curriculum and post-curriculum survey represented the primary method used to evaluate the effect of the curriculum on improving charting and coding skills. The pre-curriculum survey information was adopted from the previous year’s health policy curriculum survey, which contained self-reported comfort for the charting and coding module based on a 100-point visual analogue scale via an anonymous SurveyMonkey distribution. The same survey was distributed after the curriculum with the addition of open-

ended questions to assess strengths and areas for improvement. Survey results were not tracked to individual learners.

In July 2020, 29 individuals from our residency program responded to the pre-test survey with 1 nonresponse to the questions pertaining to reimbursement, charting, and coding. Thirty-one residents and 18 faculty and APP learners attended the TBL reimbursement workshop on July 29, 2020. Of the attendees, 10 (9 residents and 1 APP fellow) responded to the post-test survey.

To test whether the curriculum was meeting its goals for our learners, we looked at the 28 respondents to the curriculum pre-test (respondents comprised 1 faculty member, 2 APPs, and 25 residents). This represented almost two-thirds of our residents at that time (**Table 3**).

Prior to TBL, learners self-rated their comfort with understanding the 6 different evaluation and management commonly used in EM as 29.6 out of 100 (95 percent CI: 18.4, 40.9). Following the reimbursement TBL exercise, participants graded their comfort as 74.2 out of 100. This represents a statistically significant 44.6-point increase (p<0.0001).

DISCUSSION

Despite ACGME recommendations to incorporate coding and charting education into EM residency training, there is no universally accepted method for such education, and most graduating physicians do not feel adequately prepared.^{3,4,5}

Our survey results corroborate previously published reports of medical trainees’ attitudes toward their preparation with billing and coding. Prior to our workshop, fewer than one-

third felt that our current curriculum provided them with an understanding of evaluation and management (E/M) codes, with even less comfortable submitting billing charges. Providing a 3-hour workshop was enough to make learners feel more knowledgeable and comfortable with E/M code and payment models.

Residents enjoyed the format, stating that the workshop was effective, a worthwhile addition to the curriculum, and “a very effective way to communicate these points when compared to standard lecture.” Attendees also viewed the workshop as a “necessary session for us each year” and a “great introduction into the billing process and would like to get further smaller sessions through the year if possible.”

CONCLUSIONS

With the introduction of the new 2023 coding requirements, we plan to repeat this effective pedagogical method. To our knowledge, this is the first description of a TBL approach to resident billing and coding education. This approach has shown to be successful in teaching documentation and coding, fostering our residents’ competency in Systems-Based Practice.^{6,13}

We believe the TBL methodology increased learner satisfaction and engagement in comparison to previously used passive learning strategies and found that our learners self-reported significant improvements in their knowledge as a result of our curriculum. We recommend more widespread use of active learning methodologies to teach “nontraditional” components of the curriculum, such as documentation and coding. ★

The authors would like to acknowledge the following physicians for their assistance on this project: Emily Hirsh, MD, Department of Emergency Medicine, Emory University; Stan Wu, MD, Department of Emergency Medicine, Baylor College of Medicine; and Tyson Pillow, MD, Department of Emergency Medicine, Baylor College of Medicine.

TABLE 3: Assessment of Reimbursement Curriculum

Learning Objective	Self-Reported Confidence (100-point VAS)		
	Pre-Test, n=28 Mean (SD)	Post-Test, n=10 Mean (SD)	Difference
Understand 6 EM CPT codes...	29.6 (29.0)	74.2 (12.9)	44.6*
	“*” = statistically significant p<0.0001 “***” = p<0.001		
	Numbers may not sum due to rounding		

DESPITE WHAT YOU MAY HAVE HEARD... **ACEP IS THE ONE FIGHTING FOR YOU**



ACEP has invested \$1M+
of your dues dollars to
PUSH BACK ON SCOPE CREEP
at the federal and state levels.



DESPITE WHAT YOU MAY HAVE HEARD... ACEP IS THE ONE FIGHTING FOR YOU



LESS THAN 1%
of ACEP's total revenue
comes from private equity
staffing groups.



DESPITE WHAT YOU MAY HAVE HEARD... **ACEP IS THE ONE FIGHTING FOR YOU**



ACEP is currently involved in
NOT ONLY ONE BUT NINE
lawsuits to protect your
autonomy and reimbursement.



DESPITE WHAT YOU MAY HAVE HEARD... **ACEP IS THE ONE FIGHTING FOR YOU**



ACEP is the only EM
organization with
FULL-TIME, DEDICATED STAFF
IN A DC OFFICE.



DESPITE WHAT YOU MAY HAVE HEARD... ACEP IS THE ONE FIGHTING FOR YOU



ACEP is the one working for
ALL EMERGENCY MEDICINE.
From medical student to attending.
From clinical to academic.
We're proud to serve you.

SEE WHAT ACEP HAS TO OFFER TO
MEDICAL STUDENTS, RESIDENTS AND FELLOWS AT:

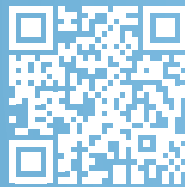


Before you embark on your
EM journey, check out...

EM*bark*



EMRA's Career Planning Center.
Information, Resources, & Advice.



emra.org/embark



Now accepting
article submissions.

More info:

emra.org/embark/submit-an-article



ECG Challenge — Brugada Syndrome

Usama Khan, MD

Emergency Medicine PGY-2, ChristianaCare

Jeremy Berberian, MD

Associate Director of Emergency Medicine Resident Education,
Department of Emergency Medicine, ChristianaCare



CASE

A 54-year-old male with a past medical history significant for primary CNS B-cell lymphoma, on chemotherapy and lacosamide for seizure prophylaxis, was admitted to the ICU for hypoxia and neutropenic fever. What is your interpretation of his ECG?

What is your interpretation of his ECG?
See the ANSWER on page 66.

Medical Student Council

A Call for Applications

Are you a medical student? Apply to be a part of EMRA's Medical Student Council! This is a phenomenal opportunity to become more involved in the field of emergency medicine, network with students and faculty from coast to coast, and develop resources to assist fellow students navigate medical school and the residency application process. Each year, 25 students from across the country are selected to serve on EMRA's MSC. Don't miss your opportunity!

Application Deadline: Nov. 1, 2023

More Information



Apply Here



ECG Challenge

ANSWER

This ECG shows atrial fibrillation with a ventricular rate of 110 bpm, normal axis, and coved STE > 2 mm followed by a negative T-wave in leads V1-V2.

The differential diagnosis for STE in lead V1 includes:

- Acute MI (anteroseptal or right ventricular)
- Acute RV strain (eg, PE)
- Brugada syndrome
- Hyperkalemia
- LBBB
- LVH
- Sodium channel blocker toxicity
- Ventricular-paced rhythm

The findings in this ECG are consistent with Brugada ECG pattern. The initial Brugada ECG criteria set forth in 20021 included 3 types:

- Type 1: Coved STE ≥ 2 mm followed by a negative T-wave in > 1 of leads V1-V3 (see Figure 1)
- Type 2: ≥ 2 mm of saddleback shaped STE in > 1 of leads V1-V3 (see Figure 2)
- Type 3: Type 1 or 2 morphology not meeting above criteria in > 1 of leads V1-V3

More recent 2013 guidelines² narrowed the definition: “Brugada syndrome is diagnosed in patients with ST-segment elevation with type 1 morphology ≥ 2 mm in ≥ 1 lead in the right precordial leads V1, V2, positioned in the 2nd, 3rd, or 4th intercostal space occurring either spontaneously or after provocative drug test with intravenous administration of class I antiarrhythmic drugs.”

The important changes in the new definition include:

1. Type 1 is the only potentially diagnostic pattern
2. Type 1 only needs to be seen in one lead and can be seen in lead(s) V1/V2 when positioned higher than the traditional 4th intercostal space
3. Type 2 is non-diagnostic and it is only clinically significant if the Type 1 pattern is seen or can be provoked with sodium channel blocking antidysrhythmics
4. Type 3 is no longer part of the criteria
5. Lead V3 is no longer part of the criteria

Brugada syndrome is caused by a mutation in the cardiac sodium channel gene (ie, a sodium channelopathy) that can lead to unprovoked dysrhythmias (polymorphic ventricular tachycardia or ventricular fibrillation) and cardiac arrest. The diagnostic criteria include both ECG changes and clinical criteria (see Learning Points below). Notably, up to 40% of patients with Brugada syndrome will have normal resting ECGs. Treatment for Brugada Syndrome is placement of an automatic implantable cardioverter-defibrillator for prevention of sudden cardiac death.

The Brugada ECG pattern can be provoked by multiple conditions, including fever and medications, in particular sodium channel blocking medications. In this case, the patient had both a fever and was taking lacosamide (which has sodium channel blocking properties), either or both of which could have contributed to the changes seen on his ECG. The significance of

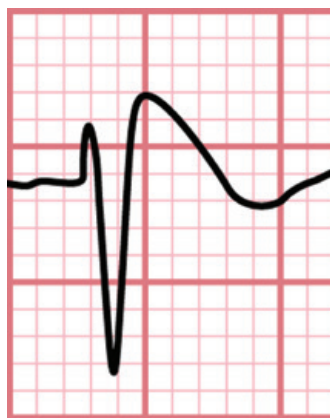


FIGURE 1. Brugada Type 1



FIGURE 2. Brugada Type 2

this finding depends on the patient’s clinical history, as the diagnostic criteria for Brugada syndrome include both ECG and clinical criteria.

CASE CONCLUSION

The patient was evaluated by Electrophysiology, who recommended fever control and discontinuing any medications with sodium channel blocking properties. Further diagnostic workup for Brugada syndrome was deferred given the lack of clinical criteria and variable utility and accuracy of electrophysiology studies for asymptomatic patients with fever-induced Brugada.

BRUGADA SYNDROME LEARNING POINTS

- Sodium channelopathy that can lead to unprovoked dysrhythmias (polymorphic ventricular tachycardia or ventricular fibrillation) and cardiac arrest
- Diagnosis made from both ECG and clinical criteria (see table)
 - Type 1 is the only ECG abnormality that is potentially diagnostic
 - Type 2 is non-diagnostic but warrant further investigation in the appropriate clinical situation
 - Type 3 is no longer considered useful in diagnosis
- Treatment is AICD placement

ECG Criteria	Clinical Criteria (must have ≥ 1):
<ul style="list-style-type: none"> • Complete or incomplete RBBB pattern with coved STE ≥ 2 mm followed by a negative T-wave in ≥ 1 of leads V1-V2 	<ul style="list-style-type: none"> • Documented VF or polymorphic VT • Family history of sudden cardiac death at < 45 years old • Coved-type ECG in family members • Inducibility of VT with programmed electrical stimulation • Syncope • Nocturnal agonal respiration

ECG Challenge

AIVR is typically transient, often lasting only minutes, and unlikely to cause hemodynamic instability. In most circumstances, there is no treatment required except for observation. Patients with decreased cardiac output may benefit from a trial of atropine to increase the SA node rate in order to restore AV synchrony and the atrial kick.⁴ Special consideration should be taken in the patient with apparent AIVR who presents with syncope as this could be a sign of a more malignant underlying cardiac issue.

CASE CONCLUSION

This patient was discharged after successful treatment of her respiratory symptoms.

ACCELERATED IDIOVENTRICULAR RHYTHM LEARNING POINTS

- Ectopic focus from Purkinje network or ventricular myocardium
- Also called ventricular escape rhythm
- ECG shows ≥ 3 consecutive, regular, wide complex beats with

no P-waves or AV dissociation if P-waves are present

- Rates between 40-110 bpm, but can sometimes be as high as 120-130 bpm
- Mimics include hyperkalemia, sodium channel blocker toxicity, and VT in patients on antidysrhythmic medications (e.g., amiodarone, flecainide, sotalol) or with severe cardiomyopathies
- Suggests partial or complete reperfusion of an occluded coronary vessel
- Classically seen in the reperfusion phase of an MI following fibrinolysis or PCI, but can also be spontaneous
- Can also be seen with digoxin toxicity, cardiac ischemia, or electrolyte abnormalities
- Usually well-tolerated, benign, and self-limiting
- Treating as VT with antidysrhythmic medications can precipitate asystole

NEWS & NOTES IN EMERGENCY MEDICINE

RAMON W. JOHNSON, MD, MBA, BECOMES PRESIDENT OF ABEM

Ramon W. Johnson, MD, MBA, is the new president of the American Board of Emergency Medicine (ABEM). Dr. Johnson has been an oral examiner since 1993 and has been a member of the board of directors since July 2015. He has served ABEM in a number of capacities, including as a chief examiner for the Oral Certification Examination, liaison to the Pediatric Emergency Medicine Subboard, and question writer for MyEMCert.



RAMON W. JOHNSON

“It is an incredible honor to represent ABEM as a community physician,” he said. “Continuing to set the highest standards for knowledge assessment and professionalism for all emergency physicians will benefit our patients and the specialty.”

D&I COMMITTEE PAPER PUBLISHED IN WESTERN JOURNAL OF EM

EMRA’s Diversity & Inclusion Committee’s paper, “A Virtual National Diversity Mentoring Initiative to Promote Inclusion in Emergency Medicine,” was published in July in the Western Journal of Emergency Medicine.

The paper describes the development and implementation of a national virtual mentoring program, the Diversity Mentoring Initiative (DMI), that paired URiM trainees interested in EM with experienced mentors. The authors found that by using a virtual platform, the DMI enhanced the

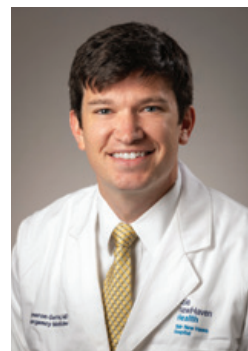
efficiency of mentor-mentee pairing, tailored matches based on participants’ interests and the bandwidth of mentors, and successfully established cross-institutional connections to support the mentorship needs of URiM trainees.

Authors were: Tatiana Carrillo, DO; Lorena Martinez Rodriguez, DO; Adaira Landry, MD, MEd; Al’ai Alvarez, MD; Alyssa Ceniza, BSW; Riane Gay, MPA; Andrea Green, MD; and Jessica Faiz, MD, MSHPM.

Congratulations to EMRA’s D&I Committee upon the paper’s publication and for their collaboration on this important project.

CAMERON J. GETTEL, MD, MHS, NAMED 2023-25 ABEM NAM FELLOW

The National Academy of Medicine (NAM) has selected Cameron J. Gettel, MD, MHS, as the 2023-25 ABEM NAM Fellow. Dr. Gettel is an assistant professor in the Department of EM at the Yale School of Medicine and a clinical investigator at the Yale Center for Outcomes Research and Evaluation.



CAMERON J. GETTEL

“I am incredibly honored to have been selected for the NAM ABEM Fellowship,” stated Dr. Gettel. “I’ve always enjoyed thinking on a larger scale toward influencing the greatest number of people, and I believe this opportunity will uniquely allow me to pursue important research questions impacting our nation’s emergency patients and clinicians.” ★



Access the BEST emergency physician career center!

ACEP and EMRA are excited to announce the launch of the new emCareers, a full-service career support network for emergency physicians and residents. emCareers connects jobseekers with open EM positions, and employers with thousands of active and passive EM jobseekers. Explore emCareers to sign up for job alerts, get specialized job search results, and discover new educational resources and networking opportunities. Take the next step in your emergency medicine career with emCareers.

Board Review Questions

PEERprep for Physicians is ACEP's gold standard in self-assessment and educational review.

For complete answers and explanations, visit the Board Review Questions page at emresident.org, under "Test Your Knowledge"

Order PEERprep at acep.org/peerprep

PEERprep
on sale
NOW!

- 1. A 35-year-old man presents with sudden, severe, tearing pain with bowel movements. He says he has a burning sensation between bowel movements. He has not noticed any swelling but says he once "saw blood on the toilet paper afterward." The physical examination is limited by intense pain on performance of digital rectal examination. What is the best initial treatment for this patient's condition?**
 - A. Botulinum toxin injection
 - B. Elliptical incision
 - C. Sitz baths and a high-fiber diet
 - D. Topical nitroglycerin
- 2. Which life-threatening skin disorder has mucocutaneous involvement, a positive Nikolsky sign, and full-thickness skin sloughing involving approximately 8% of total body surface area?**
 - A. Erythema multiforme
 - B. Staphylococcal scalded skin syndrome
 - C. Stevens-Johnson syndrome
 - D. Toxic epidermal necrolysis
- 3. A 56-year-old woman presents with severe pain in the index finger of her right hand. She says that she punctured it 2 days ago while gardening. On examination, the finger is swollen and tender. Sensation and circulation are intact, but the patient is unable to extend the finger without screaming in pain. What is the best next step?**
 - A. Discharge with antibiotics and follow-up instructions
 - B. Immobilize the finger for comfort
 - C. Perform incision and drainage
 - D. Start parenteral antibiotics
- 4. A 26-year-old man presents via ambulance and is surrounded by police officers. He shouts verbal threats at staff members while being taken into a treatment room. His girlfriend says he has bipolar disorder and has been behaving erratically. Which technique for managing this patient's aggressive behavior should be attempted first?**
 - A. Physical restraint
 - B. Sedation
 - C. Show of force
 - D. Verbal de-escalation
- 5. A 16-year-old boy presents with eye pain and worsening vision after being struck in the face with a bat during a baseball game. The eyeball is protruding and bloody; intraocular pressure is 45 mm Hg. The ophthalmologist is in surgery and will be unavailable for 1 hour. What is the best next step in management?**
 - A. Arrange for outpatient follow-up
 - B. Instill pilocarpine and timolol drops
 - C. Perform lateral canthotomy
 - D. Perform ocular massage

ANSWERS
1) C, 2) C, 3) D, 4) D, 5) C



NEW ORLEANS



CORD ACADEMIC ASSEMBLY

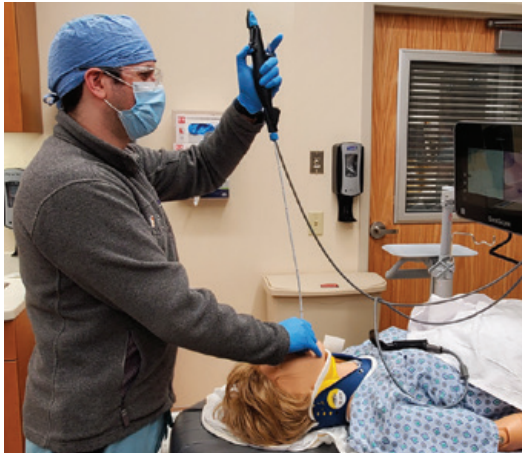
CORD
EM

35TH ANNIVERSARY

MARCH 25TH - 28TH, 2024

#CORDAA24





Emergency Medicine Residency Program

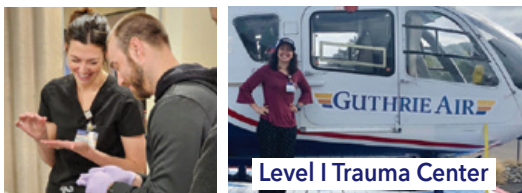
Hands-on experience with a diverse case mix at a state-of-the-art facility.

Train in EVERY environment. Work in ANY environment.

Guthrie is the premier health care system nestled in the endless mountains region of Pennsylvania and the Finger Lakes of Central New York. As an emergency medicine resident, you will have hands-on-training from expert leading faculty that serve a diverse mix of patients.

As a Guthrie emergency medicine resident, you will benefit from interprofessional training and foster relationships that will last a lifetime.

- Established and accredited Emergency Medicine Residency Program.
- Tertiary and community hospital training sites with a combined volume of 75K patient visits a year.
- Safe family friendly environment.
- Robust EMS and helicopter services covering 10,000 square miles.
- Pediatric training at CHOP and Albany Medical Center.
- 11 residency and fellowship programs and growing.



If you want to experience hands-on Emergency Medicine Training with great faculty amongst a diverse case mix in a recreational paradise, then we invite you to explore what Guthrie has to offer.



For more information please scan the QR code.



Talking about the issues that matter.

Listen today!



emracast.org

Supported by



Better health. Best in health care.

Burnaby Emergency Physicians Association

Are you a Canadian or wannabe Canadian ER physician? Burnaby Emergency Physicians Association seeks ABEM certified physicians for our busy 82000 visit urban non trauma centre in Vancouver BC.

Burnaby Hospital, next to Vancouver, provides a great location for work and living options. It is a nice, diverse practice including peds with wonderful colleagues. There is a strong MSA at the hospital level and our longstanding ER group structure has stable fee for service income. We have a relationship with Royal Columbian Hospital for smooth and rapid transfer for STEMI, neurosurgery and interventional stroke and vascular procedures. There is a mentor system with several ABEM physicians, so we are used to the process. There is an opportunity for up to 10000 dollars CAD moving allowance.

If you are interested in finding out more about us and the opportunity, you can contact Dr Joanne Rowell-Wong, Hiring and Credential Lead, at joanne_r_wong@yahoo.com.



“Being a **physician-led and APP-led group** means that our **clinicians are making the decisions**; that we’re giving our clinicians the **tools they need.**”

— **JEFFREY RABRICH, DO, MBA, FACEP, FAEMS**
SVP, Emergency and Hospital Medicine

What’s Your Vision for a Stronger Emergency Medicine Career?

Emergency physicians turn to Envision to grow their careers because we create practice environments that support their success, professional growth and wellness.

- Physician-led group on the local, regional and national levels
- Flexible and equitable scheduling that supports work-life balance
- Leadership development and mentoring programs
- Full-time, part-time, per diem and ENVOY Ambassador Team opportunities
- Partnerships at respected facilities in attractive locations nationwide
- Robust support for professional wellness
- Opportunities for clinical and scientific research
- Experienced clinical leaders who understand your career goals

Transition To Practice

Schedule an Envision Transition to Practice Event for your residency program. Our clinical leaders will answer your most pressing questions and review what to consider when looking for your ideal career opportunity.

To schedule an event, contact Jessica Esposito, National Residency Recruitment Manager, at **608.216.6087** or **Jessica.Esposito@EnvisionHealth.com**.



Earn While You Learn

Earn up to \$2,500 a month in your final year of training. This opportunity is site- and specialty-specific, so talk with your recruiter to learn more.

Featured Emergency Medicine Physician Opportunities

Ascension Sacred Heart Hospital Pensacola
Pensacola, Florida

HCA Florida Brandon Hospital
Brandon, Florida

HCA Florida Citrus Hospital
Inverness, Florida

HCA Florida Fawcett Hospital
Port Charlotte, Florida

HCA Houston Healthcare West
Houston, Texas

Corpus Christi Medical Center Doctor’s Regional
Corpus Christi, Texas

Northeast Methodist Hospital
Live Oak, Texas

Northern Nevada Medical Center
Sparks, Nevada

St. Joseph’s Health
Syracuse, New York



Ready to strengthen your EM career?
Speak with our experienced recruiters today.
833.493.0164
Envision.Health/EMRA23





Penn State Health Emergency Medicine

About Us:

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



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

Benefit highlights include:

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



PennState Health

FOR MORE INFORMATION PLEASE CONTACT:

Heather Peffley, PHR CPRP - Penn State Health Lead Physician Recruiter
hpeffley@pennstatehealth.psu.edu

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



Emergency Medicine Residents' Association
 4950 W. Royal Lane
 Irving, TX 75063
 972.550.0920
emra.org

PRSR STD
 U.S. POSTAGE PAID
 Madison, WI
 Permit No. 1457

RESUSCITATE YOUR RETIREMENT PLAN

USACS: YOUR LIFELINE WITH **AN ADDED 10% TO YOUR 401(k)**



I love seeing patients now, and I love that we're setting ourselves up for a great retirement later.

Kendall Rockler, MD, FACEP
 Residency: University of South Florida, 2014
 National Director of STAT Traveling Physicians



All full-time physicians are provided:

Company stock ownership | 10% company-funded 401(k) | 24/7 on-shift clinical support
 Great locations nationwide | The best health and wellness benefits | A mission that has real meaning

Learn more at: usacs.com