

EM Resident

Official Publication of the Emergency Medicine Residents' Association

January | February | March 2023

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Safety Net

SUPPORTING PATIENTS
ACROSS THE LIFESPAN



The Unfavorable
Patient

Tips for
Palliative
Consults

Physician's
Perspective:
Treating
Persons with
Disabilities

Meet Your New
EMRA Board

President's
Message:
Match 2023
and the
Future of the
Specialty



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THUY NGUYEN, MD

Editor-in-Chief, EM Resident
University of Connecticut



New Beginnings, Renewed Dedication

As we usher in the new year, I am elated to join our EMRA family as editor-in-chief of *EM Resident* and to do my part in contributing to EMRA's mission: supporting those of us in training so we can become the best doctors and leaders we can be, and ensuring emergency medicine becomes the best specialty it can be.

The core reason for my love of EM is our privilege of being anyone's doctor, whenever they need us. Our hands come together and allow us to serve and support patients from all walks of life; our doors are open when patients have nowhere else to turn. As a specialty, EM has withstood wave upon wave of adversity, and as physicians in the specialty, we don't allow ourselves to sink. I am proud that this issue of *EM Resident* reflects our current inclusive practice of EM, while simultaneously encouraging us to embrace all aspects of emergency care.

In this edition, our esteemed contributors urge us to maintain keen clinical sense during sepsis source inspection ("Sepsis Alert: Care Pathways in the ED," page 26, and "Pelvic Sepsis: A Fatal Complication of Routine Hemorrhoidectomy," page 48). They remind us that we are the frontline of medicine, the first doctors to care for concerns ranging from toxic

environmental exposures ("Top Gun Toxicity: Military-Grade Hydrocarbon Exposure Management in the ED," page 56) to the exploitation of human lives exacerbated by a pandemic ("Pilot Study: Evaluating Education Targeting Intimate Partner Violence, Human Trafficking in an EM Residency," page 29).

Our authors also encourage the careful use of language across our practice, both when speaking to patients with disabilities and when caring for patients with different communication needs ("Emergency Physicians' Perspective: Caring for Persons with Disabilities," page 58, and "Words Matter: The Importance of Communication in Medicine," page 46). The importance of effective communication is extended to difficult conversations regarding end-of-life care and how palliative medicine can ease the pain experienced by all in these unfortunate circumstances ("Palliative Care in the ED: Past, Present, and Future," page 53, and "Tips for Palliative Medicine Consults in the ED," page 50).

The articles referenced above highlight only a fraction of the talent and knowledge among our authors and within our profession; I am hopeful that each of you will find something that resonates on the pages of this edition of *EM Resident*. I also hope the content serves as a reminder

of EMRA's unwavering support as you care for and dedicate yourselves to your patients in this new year.

While our dedication to our patients remains the same, a new year is also a time for new beginnings. On that note, we would like to announce a shift in our publication strategy, moving from fewer pages printed 6 times per year to a more substantial page count printed quarterly. Our shift from bimonthly to quarterly comes with perks for you — our revered readers, contributors, and EMRA members. Each edition will have significantly more pages. For our readers, this means more articles, more clinical content, more information, and more knowledge-sharing in a focused time period. For our contributors, more pages translate to more space, which means we'll publish more of your papers. And for our membership, this change signals yet another reason to hold your head up high: As tangible newspapers and magazines disappear all around us in favor of a digital-only presence, *EM Resident*, EMRA's publication of record, is still going strong — both in print and online. I invite you to visit *EM Resident* online at www.emresident.org, where you'll find ahead-of-print papers, on-demand content from the pages of our print magazine, and much, much more. ★

Thuy Nguyen, MD

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

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Emergency Medicine Residents' Association



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EM Residency Applications are Down. What Does This Mean for our Future?



Jessica Adkins Murphy, MD
EMRA President
[@DrAdkinsMurphy](https://twitter.com/DrAdkinsMurphy)

Based on recent ERAS data, medical student applications to EM residencies are significantly decreasing for the second year in a row. In Match 2022, many programs had unfilled positions that were later filled with unmatched medical student applicants from the Supplemental Offer and Acceptance Program (SOAP) at higher rates than had been seen in years. This spring, that trend is expected to be even more prevalent.

To quote Match expert Dr. Bryan Carmody, “The decline in applicants isn’t a problem per se – it’s a sign of bigger concerns. It’s like fever, or metabolic acidosis, or sinus tachycardia. It’s just an outward manifestation of internal problems, and it’s best managed not by treating it directly, but by addressing the underlying cause.”

I agree. This is likely a ripple effect of underlying issues mounting in emergency medicine. And if programs hope to recover their formerly competitive medical student recruiting, and applicants

hope to match without the stressful scramble of the SOAP, we will all have to reckon with several structural and cultural challenges in EM that have come to a head in recent years.

But first, it’s essential that residents, program directors, and medical students understand this data and the factors at play in these trends. We must listen to the concerns that medical students cite when discussing their hesitancy to join EM. And we must share ways you can join EMRA in innovating solutions to these issues and recruiting EM’s next generation of clinicians, educators, and leaders.

THE DATA

For years, applicants to EM increased in parallel with the increase in residency positions. Consistently, there were a greater number of applicants than residency positions, and the number of EM residency positions left unfilled through the Match was fewer than 30 for more than 15 years. This made even those unfilled positions highly competitive when

they became available through the SOAP.

In the past 3 years, the number of applications has taken a downturn, decreasing by 20% since 2020. Applications received per program have decreased even more, down 30% since 2020. In the 2022 Match, this decrease resulted in 219 unfilled positions. Almost all were filled through the SOAP. Given these trends, the number of unfilled positions through Match 2023 may be even greater.

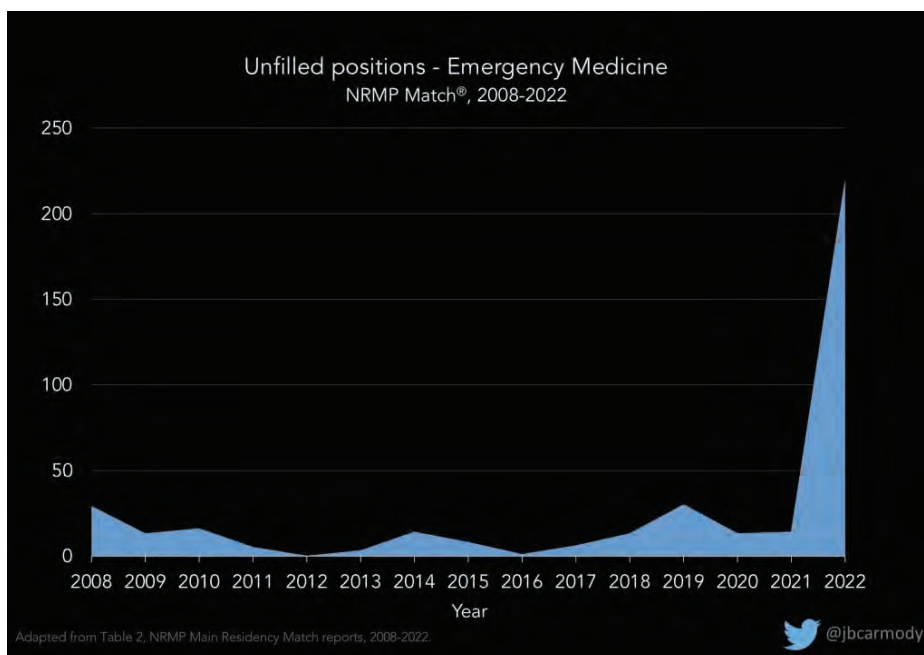
This data, while preliminary, is a useful predictor for Match 2023. It comes from ERAS statistics obtained Oct. 5, 2022. At this point in the 2023 Match cycle, ERAS has most likely received the majority of MD and DO applicants anticipated, and MD applicants have demonstrated the most profound decrease at 31%. IMGs have actually increased in the same timeframe by 28%, though these applicants are more likely to go unmatched than their U.S. counterparts.

This decrease in applicants is exacerbated at the program level by increases in programs’ class sizes and openings of new programs. Between 2018 and 2022, 643 new positions were added to the EM Match, an increase of 28.2%.

Notably, after the SOAP almost every EM position does fill, with hundreds of applicants to EM remaining unmatched even after the SOAP in 2022 (though it’s unknown how many of these applicants may have dual-applied and ultimately matched into another specialty). In contrast, some other specialties routinely have positions remaining empty, even after SOAP.

MEDICAL STUDENT HESITANCY

EMRA members span all stages of EM careers, including more than 3,500 medical student members with a passion for our specialty. Some have shared with



Graph courtesy of Dr. Bryan Carmody, used with permission.

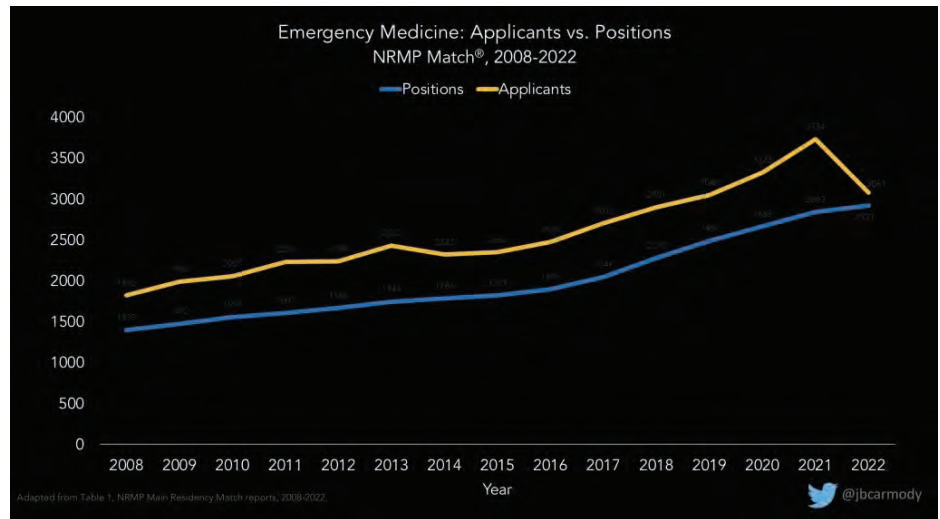
EMRA the concerns that have made them more hesitant about a career in EM, and that have made their classmates choose other specialties entirely.

Some are concerned about the future of the EM job market, which felt more bleak in the wake of the 2021 workforce report *The Emergency Medicine Physician Workforce: Projections for 2030*. The report predicted a surplus of 7,845 EM physicians by 2030. For medical students saddled with hundreds of thousands of dollars in debt or for those with geographic ties or career considerations limiting where they would want to work, the concern about saturated job markets was enough to drive them away. Some medical students have cited specifically the corporate practice of medicine encroaching on hiring, firing, and staffing decisions, and on the increased independent practice of NPs and PAs as factors making EM less attractive.

Compounding the impact of the workforce report, it was released at a time when ED visits hit a nadir not seen in recent years, resulting in reduced staffing, and during an unusually difficult job market for the graduating resident class of 2021. Even at the time, this challenge was expected to be a short battle, and we have since recovered with many EDs reporting volumes surging past pre-COVID-19 levels. However, with this unfortunate timing, the unfavorable 2030 job market seemed even more imminent than projected.

Some EM-bound medical students express that there are causes beyond the job market that need to be addressed. In fact, some say the workforce report is almost used as a scapegoat to avoid reckoning with other changes to emergency medicine that have afflicted the specialty.

For example, since the COVID-19 pandemic, the topic of physician burnout and suicide has been dominating headlines more than ever. EM nurses and physicians in particular have been bold advocates for transparency in our personal struggles with the tragedies and violence we experienced through the pandemic. This has resulted in great strides in breaking down the stigma



Graph courtesy of Dr. Bryan Carmody, used with permission.

associated with mental health, and even led to federal legislation with the Dr. Lorna Breen Health Care Provider Protection Act. This also has resulted in greater attention to ensuring our EDs take measures to protect us with adequate PPE, security in seeking psychiatric help, and procedures for responding to workplace violence.

At the same time these stories were impressing upon administrators and legislators the importance of systemic change in health care, these stories were also reaching medical students and painting a stress-inducing portrait of daily life in the ED. And in the setting of our legitimate concerns about our wellness and personal safety amid the pandemic, it was difficult to tactfully share the rewarding aspects of our work as well. Some emergency physicians have attempted, via social media, to offer hope that the future of EM is bright and have shared that they still enjoy their daily work, only to be labeled toxic-positivity-spewing physicians with their heads in the sand. Communicating the complexity of the frustrations, triumphs, honor, and pain that comes with this work is difficult to achieve in just 280 characters.

And offline, these students, more than classes before them, did not have the counterbalance of clinical experiences in the ED to show them the rewarding aspects of our work saving lives and supporting the underserved. Rather, our medical student members reported that

their clerkship experiences were limited: Some were told not to see any patients with respiratory or infectious complaints due to the COVID-19 pandemic, and some didn't have the ability to complete a third-year EM clerkship at all. Many had completely inactive emergency medicine interest groups through the first years of medical school when they would have otherwise been in simulation workshops learning to suture, intubate, and resuscitate critically ill patients.

THE EFFECTS: IMPENDING DOOM OR BLUE SKIES

In speculating on the downstream effects of this change in the competitiveness for an EM residency placement, it is easy to speak in extremes. However, a nuanced discussion carried out with compassion for the applicants who are still applying to EM may be more productive.

On one hand, we should not ignore recent trends and statistics. We should take the cue that this specialty may not be as attractive as it once was, and be self-critical enough to address the elements at play that do actually warrant intervention. To take a more positive perspective, however, EM will not suddenly wither away now that we have slightly fewer unmatched applicants, stressed about their inability to join their chosen specialty. Furthermore, EM has not been made better by having hundreds of unmatched applicants, redirected through

Continued on page 70

SPOTLIGHT ON: Newly Elected EMRA Board Members Fall 2022

EMRA is pleased to welcome the newest members and representatives to the EMRA Board of Directors.

Jessica Adkins Murphy, MD

University of Kentucky | Lexington, Ky.
President

WHAT'S YOUR FIRST PRIORITY AS EMRA PRESIDENT?

I am serving as president to represent the voice of EM residents to the organizations that hold the power to advance our training, our wellness, and our specialty. I hope, by supporting our strong relationships with ACEP, ABEM, the ACGME, and more, we can better cooperate and communicate on issues like the workforce, improving diverse representation in EM, medical student recruiting, and tackling the social challenges our patients face. I want these communications to go beyond tweets and headlines. Let's have nuanced, personal, open conversations about these issues with residents, attendings, and students.

WHERE DO YOU WANT EMRA TO BE AT THIS TIME NEXT YEAR?

EMRA is already excellent internally, serving our members well through our publications, committees, events, and benefits. That will not change. The next step is to strengthen our outward-facing presence. I want the larger medical community to know EMRA and to see EMRA how I see it: as the creative, solution-oriented, forward-thinking coalition of thousands of trainees passionate about changing the world through EM.

HOW CAN EMRA MEMBERS MAKE A DIFFERENCE?

EMRA members make a difference every day that they show up for their shifts and serve patients through the hardest moments of their lives. But they also go above and beyond by advancing the specialty through research and publications. They make an impact on health policy through the EMRA Representative Council and meeting with their state and federal legislators. They have ripple effects through the next generation of EM when they serve as mentors and make connections across programs in EMRA Committees. And they make a difference in their own careers when they take advantage of EMRA's many early-career resources, now known as EMBark!

HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?

Running with my dog, going out with my husband, but most importantly, SLEEP! Sleep and coffee are my hard reset.

WHAT IS SOMETHING PEOPLE DON'T KNOW ABOUT YOU?

Hablo español con fluidez.

ONE SKILL YOU WANT BUT DON'T HAVE (YET):

Being better at remembering names. I'm working on it!



ONE SKILL YOU COULD DO WITHOUT:
I probably spend way too much time listening to true crime podcasts.

FAVORITE FOLLOW ON SOCIAL:
@ukemres on Instagram and @wildcatemres

Blake Denley, MD

Ochsner Health | New Orleans, La.
President-Elect

WHAT ARE THE MOST PRESSING ISSUES FACING EM?

I'll pick three things: burnout, workforce, and scope creep.

BURNOUT: Many people saw Medscape's report this year that had EM with the highest rate of burnout among all specialties that participated in the survey. It's a concerning statistic, but it's not surprising given what our specialty has been through over the past few years. However, it doesn't mean that you have to be burnt out or that things can't/won't get better. In the pressure cooker that is medical education and working as an emergency physician in general, too often the conversations surrounding burnout are all about building resiliency. However, at some point the work environments and experiences create a pressure so high that it can't be contained with more resiliency. That is why I think more efforts need to address the systemic issues that continue to put us under more and more pressure. I will note that on the topic of resiliency, I believe finding purpose and fulfillment is the best protector against burnout, which is why I find involvement in EMRA so meaningful.

WORKFORCE/RESIDENCY GROWTH:

This is currently the hot topic, and by the time this edition of EM Resident is published, we should have new, updated data regarding the surplus estimates. I think the continual growth of current residencies and addition of new residencies are big issues without easy or obvious fixes, but I am confident EM will get through these hard years a stronger, more thriving specialty, and I'm excited to play a role in our development.

SCOPE CREEP/DEVALUATION OF PHYSICIANS:

To me, scope creep and independent practice reflect a devaluation of physicians. It is, most importantly, a threat to patient safety, especially in the emergency department. Additionally, it is a threat to physicians in many ways. We must continue fighting for physician-led and physician-supervised care in all EDs, and we need to be more proactive with providing our own legislation rather than always being on the defensive.

HOW CAN EMRA MEMBERS MAKE A DIFFERENCE?

GET INVOLVED. EMRA has so many amazing leadership, educational, and networking opportunities through our committees and other programming. If you have a passion, we'll help you pursue it. If you don't know what your passion is, we can help with that too! Not sure where to start? Check out the "Be Involved" tab on emra.org, or reach out directly to me via email at presidentelect@emra.org.

HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?

I can go down a few routes for this one, but the top of the list would include either a nap or some quality time with my fiancée and golden retriever.

WHAT IS SOMETHING PEOPLE DON'T KNOW ABOUT YOU?

I am a former world champion jump-roper. Feel free to YouTube me for some old videos!



ONE SKILL YOU WANT BUT DON'T HAVE (YET):

I want to speak Spanish fluently one day. I spent a few months in Ecuador studying Spanish before medical school, and I did a Medical Spanish elective in Mexico my fourth year. Unfortunately, I haven't kept up with studying, but I'm not giving up on the goal!

ONE SKILL YOU COULD DO WITHOUT: My ability to eat an incessant amount of desserts.

FAVORITE FOLLOW ON SOCIAL:

All of the local plant shops in New Orleans.

SPOTLIGHT ON: Board Members

Thuy Nguyen, MD

University of Connecticut | Hartford, Conn.
Secretary/Editor, EM Resident

TWITTER HANDLE?

@ThuyNguyenMD, same as Instagram

WHAT'S YOUR FIRST PRIORITY AS AN EMRA BOARD MEMBER?

As important as you — the EMRA membership — are to me, my primary focus as an EMRA board member is to familiarize myself with the operations and intricacies involved in this role. I want to make sure I am actively listening and absorbing all the information necessary for me to do my best job. By the time you read this, I expect to have become familiar with the EMRA board and to have shifted my focus to amplifying your voices.

WHAT IS THE BEST ADVICE YOU'VE EVER RECEIVED?

The best advice I have received lately is from my program director, Dr. Shawn London, who has reiterated “nothing ventured, nothing gained” when I have come to him for guidance regarding clinical, professional, and personal decisions. Oftentimes, we limit ourselves out of fear of rejection. This type of support has significant meaning to me, coming from my program leadership, and not only do I hope to carry the sentiment with me as I advance in my career, I hope to also impart the same wisdom and encouragement to our membership and anyone who may feel comfortable enough to look to me for guidance.



HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?

If it is a particularly catastrophic shift, I will lean on one of my close friends in residency or speak to my best friends from medical school, whom I keep in touch with daily. I have also relied upon my faculty advisor for debriefing on the case, my clinical decision-making, and ways in which I can improve. On a more personal note, the gym is my sanctuary, and I always feel better after lifting weights.

WHAT IS SOMETHING PEOPLE DON'T KNOW ABOUT YOU?

My fastest NYT Mini Crossword solve time is 9 seconds.

ONE SKILL YOU WANT BUT DON'T HAVE (YET):

Skiing/snowboarding.

ONE SKILL YOU COULD DO WITHOUT:

Fecal disimpaction.

DOES PINEAPPLE GO ON PIZZA?

Yes, with ham.

FAVORITE COMFORT FOOD (OR DRINK):

Pho.

SPOTLIGHT ON: Board Members

Aaron R. Kuzel, DO, MBA, EMT-T

Fellow | University of Louisville School of Medicine | Louisville, Ky.
EMRA Representative to ACEP

TWITTER HANDLE?

@DrKuzee, although I'll be honest, I don't use Twitter.

WHAT'S YOUR FIRST PRIORITY AS AN EMRA BOARD MEMBER?

My first priority, and always my first priority, is to be accessible to the membership and represent their interests to the EMRA and ACEP Boards of Directors. The future of emergency medicine should have a voice in the direction of the future of emergency medicine, and I intend to be that instrument. Secondly, I look forward to meeting the ACEP section EMRA representatives and assisting the EMRA board in filling vacancies with members interested in leadership opportunities.

WHAT IS THE BEST ADVICE YOU'VE EVER RECEIVED?

The best advice I have ever received is never be scared to fail. Failure is a powerful teacher. It is a great nemesis as it makes us feel terrible, but also, failure is a wonderful mentor. We are often taught to fear it, but it is better to embrace it. I have been blessed with many unique opportunities for simply saying, "Why not try?" Let me tell you, there have been a lot of misses (even more sleepless nights), but the trick is to not let it discourage you and keep trying.

HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?

With a stiff pour of good ol' Kentucky Bourbon. I'm kidding, maybe, but mostly spending time with my wife and my residency classmates. They're truly special, and I am extremely lucky to have them in my life.

WHAT IS SOMETHING PEOPLE DON'T KNOW ABOUT YOU?

I am actually a professionally trained classical tenor (singer). I've even performed globally, including during High Noon Mass at The Vatican.

ONE SKILL YOU WANT BUT DON'T HAVE (YET):

Easy, pilot an aircraft. One day when I'm an attending, I want to get my pilot's license. That or become a bourbon distiller.

ONE SKILL YOU COULD DO WITHOUT:

I have an incredible ability to attract the worst cases that emergency medicine has to offer, so much so that my program saw fit to award me with the "Black Cloud Award." As much as I love the challenge, I'd really like to be a white cloud attending, but so far, no dice.

DOES PINEAPPLE GO ON PIZZA?

Absolutely not. Perhaps one could argue that pineapple on pizza is sacrilegious haha.

FAVORITE COMFORT FOOD (OR DRINK):

I think I would say a slice of Chicago-style pizza or Raising Canes, but I think those who know me would say Diet Coke.



Kenneth Taeyoung Kim, MD

UCLA Ronald Reagan | Olive View Emergency
Los Angeles, Calif.

Director of Health Policy

TWITTER HANDLE?
I don't have a twitter.

WHAT'S YOUR FIRST PRIORITY AS AN EMRA BOARD MEMBER?
Identifying ways that we can make health policy more accessible to the general membership and identifying EMRA members who want to help make this a reality.

WHAT IS THE BEST ADVICE YOU'VE EVER RECEIVED?
"Slow is smooth, smooth is fast." Doing complex things intentionally in the right way first will save you time in the long run.

HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?
A drink with co-residents at Mom's Bar (a local bar in West LA), a few YouTube videos, and a long night's sleep.

WHAT IS SOMETHING PEOPLE DON'T KNOW ABOUT YOU?
I majored in Classics (Ancient Greek and Roman Studies) in college.

ONE SKILL YOU WANT BUT DON'T HAVE (YET):
Being able to speak foreign languages fluently (currently learning Korean, Spanish, and Japanese!).

ONE SKILL YOU COULD DO WITHOUT:
(Very) Amateur Beatboxing that I picked up during college a capella.

DOES PINEAPPLE GO ON PIZZA?
Not on MY pizzas.

FAVORITE COMFORT FOOD (OR DRINK):
Korean Tofu Stew or an In-N-Out Double-Double burger.



Kimberly Herard, MD

Emory University School of Medicine | Atlanta, Ga.
Member at Large

TWITTER HANDLE?
@Kimmybearx2

WHAT'S YOUR FIRST PRIORITY AS AN EMRA BOARD MEMBER?
My first priority as a board member is to ensure that my intentions to increase diversity, equity, and inclusion are put into action and making a positive impact for EMRA members. To ensure I am putting my best foot forward and lifting EMRA up with a great new team!

WHAT IS THE BEST ADVICE YOU'VE EVER RECEIVED?
The best advice I have ever received is that I am capable of handling all that comes at me. I am never given more than I can bear. So do what you can, with what you have, where you are.

HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?
After a tough shift, I say a prayer, express my gratitude, and head home where I will eat a slice of cake, watch a movie, read a book, and burn a candle.

WHAT IS SOMETHING PEOPLE DON'T KNOW ABOUT YOU?
People often don't realize I am terribly afraid of all animals, including your pet dogs and cats.

ONE SKILL YOU WANT BUT DON'T HAVE (YET):
One skill I want and don't have yet is being able to roller skate. I am struggling with this learning thing.

ONE SKILL YOU COULD DO WITHOUT:
One skill I can do without: Hmm, I like having skills, so I think I would want



them all! No skill is wasteful I believe!

DOES PINEAPPLE GO ON PIZZA?
Pineapple absolutely does not belong on pizza. It just does not.

FAVORITE COMFORT FOOD (OR DRINK):
Favorite comfort food: Cake. Birthday cake/funfetti to be exact!

Angela Wu, MD, MPH, MSc

George Washington
EMRA Rep to the AMA

TWITTER HANDLE?
@angwuMD

WHAT'S YOUR FIRST PRIORITY AS AN
EMRA BOARD MEMBER?

My first priority is to organize an advocacy week to give all EMRA members a voice in things that matter most to us.

WHAT IS THE BEST ADVICE YOU'VE
EVER RECEIVED?

It's better to honestly fail at something than to lie or cheat, and never be afraid to say you don't know.

HOW DO YOU RECHARGE AFTER
A TOUGH SHIFT?

I take a little alone time at first and debrief with a co-resident or my mentor to avoid taking too much of work home. Then I can recharge through quality time with my loved ones.

WHAT IS SOMETHING PEOPLE DON'T
KNOW ABOUT YOU?

I got into medical school with just one interview on the last interview date of the year, so I constantly feel blessed to be where I am today.

ONE SKILL YOU WANT BUT DON'T
HAVE (YET):

Comfort with discussing medical topics in Mandarin. I have native fluency but still need to learn the medical terminology like I did in English!

ONE SKILL YOU COULD DO WITHOUT:
I fall asleep whenever not actively doing something, and sitting in dark rooms just about knocks me out instantly. Useful for sleeping after night shifts and on airplanes, but definitely inconvenient at other times (ie, my radiology rotation).



DOES PINEAPPLE GO ON PIZZA?

Yes! But also I will eat any food that is placed in front of me.

FAVORITE COMFORT FOOD (OR DRINK):
Noodle soup

Derek Martinez, DO

The University of Oklahoma | Tulsa School of Community Medicine
Director of Leadership Development

TWITTER HANDLE?
@DrDmart120

WHAT'S YOUR FIRST PRIORITY AS AN
EMRA BOARD MEMBER?

Building relationships with the members of this incredible organization. I think being a new board member means doing a lot of listening and learning. Ultimately, I want to help our members be leaders in whatever they choose to pursue.

WHAT IS THE BEST ADVICE YOU'VE
EVER RECEIVED?

"Humble in victory, gracious in defeat." Someone wrote it in my yearbook in middle school and it stuck with me.

HOW DO YOU RECHARGE AFTER A
TOUGH SHIFT?

Recently, it has been Headspace (thanks EMRA!). It's an awesome app, takes just a few minutes, and helps me clear my mind after shift so I can be present for my family and other responsibilities. I never

thought I'd be a Headspace guy, but seriously — give it a try!

WHAT IS SOMETHING PEOPLE DON'T
KNOW ABOUT YOU?

I'm in a band with my co-residents! Hiett and the interns. We're not very good...yet.

ONE SKILL YOU WANT BUT DON'T
HAVE (YET):

You already know if you saw me on the dance floor at the EMRA party. I am a terrible dancer and have zero rhythm. I am open to lessons/pointers!

ONE SKILL YOU COULD DO WITHOUT:
Is golf a skill? Pass.

DOES PINEAPPLE GO ON PIZZA?

Oh, for sure. Step outside your comfort zone, people.



FAVORITE COMFORT FOOD (OR DRINK):
Mom's Caldo de Pollo. Honestly, anything my mom makes; she is an amazing cook.

SPOTLIGHT ON: Board Members

Michaela Banks, MD, MBA

Louisiana State University New Orleans | Health Science Center | New Orleans, La.

Vice Speaker of the Council

TWITTER HANDLE?

@michaelabanks

WHAT'S YOUR FIRST PRIORITY AS AN EMRA BOARD MEMBER?

To engage the voices of members who have traditionally not felt like they have the ability to do so.

WHAT IS THE BEST ADVICE YOU'VE EVER RECEIVED?

Release all that you cannot control.

HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?

Ride my Peloton or watch the Real Housewives of Beverly Hills.

WHAT IS SOMETHING PEOPLE DON'T KNOW ABOUT YOU?

I am a certified yoga instructor.

ONE SKILL YOU WANT BUT DON'T HAVE (YET):

Playing tennis!

ONE SKILL YOU COULD DO WITHOUT:

Buying new hair products anywhere I go.

DOES PINEAPPLE GO ON PIZZA?

Definitely.

FAVORITE COMFORT FOOD (OR DRINK):

Rajas con crema tacos with tons of salsa.



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to **CORD**
Academic Assembly
LAS VEGAS
#CORDAA23

Emergency medicine's leading academic conference is almost here!

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CORD
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Leadership & Advocacy Conference

ACEP Leadership & Advocacy Conference 2023

This is the premier policy conference for emergency physicians. At LAC, you'll have the opportunity to hone advocacy skills, understand the latest issues facing EM, and speak with your Congressional representatives. Bring your excitement to learn and your desire to advocate for the rights of patients, residents, and emergency medicine.

Not a policy veteran? No worries. EMRA teams up with the ACEP Young Physicians Section to present the Health Policy Primer to kick off the conference. This is a can't-miss event for all LAC attendees, especially our first-timers.

Attend LAC to help tackle problems facing our specialty, develop tools to advocate at all levels, and build relationships with your members of Congress — all while connecting with EM's most influential leaders.

April 30 - May 2, 2023

Grand Hyatt • Washington, D.C.



emra.org/leadership-advocacy-conference and acep.org/lac

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SPOTLIGHT ON: Health Policy Academy Fellows

The EMRA and ACEP Health Policy Academy is a highly selective year-long academy that trains you to be a policy advocate in emergency medicine. It's designed to give passionate residents like you the opportunity to impact policy within emergency medicine at a local and national level and set you up for a lifetime of advocacy and national involvement.

**Congratulations to our most recent class of Health Policy Academy Fellows:
Evelyn Huang, Jacob Altholz, Kenneth Kim, and Vishnu Muppala!**

Evelyn Huang, MD

Health Policy Academy Fellow

WHAT DID YOU GAIN FROM YOUR YEAR-LONG EXPERIENCE AS A HEALTH POLICY ACADEMY FELLOW?

So much! This was a “crash course” in all aspects of health policy — from monthly meetings/lectures on interesting health policy topics to learning how to write a resolution and advocate properly and effectively. We were also able to attend national meetings and meet health policy leaders from across the country. I have learned what it takes to become a leader in our field and how to make the world of emergency medicine better for us and for our patients.

WHY WOULD YOU ENCOURAGE OTHERS TO APPLY FOR HEALTH POLICY ACADEMY?

“Health policy” is such a broad topic, and there are so many branches and ways to get involved. This fellowship helps you to break it down and to learn more about the many different aspects of health policy. The fellowship is also exciting because you can shape it to your career goals/interests. If you are passionate about a certain topic, then you can write resolutions based on that topic and request a lecture to learn more.

WHAT SPECIFIC POLICY (OR POLICIES) DO YOU HOPE TO FOCUS ON, AND ADVOCATE FOR, AS A DIRECT RESULT OF YOUR INVOLVEMENT IN HEALTH POLICY ACADEMY? IN OTHER WORDS, WHAT ISSUES AFFECTING THE REALM OF EM ARE IMPORTANT TO YOU?

I hope to continue our focus on mental health! While I do think that most institutions and physicians are well aware of this problem, now is time to identify actions that we can take to combat barriers to mental health treatment. While I was able to pass an EMRA resolution regarding mental health questions in state medical licensures, I hope to one day make this a national policy. I want to get rid of any invasive mental health questions on all state licenses, except for questions that relate to current impairment or inability to perform the duties of a physician. It is my hope that this can act as one less barrier to getting help when we need it.



I would also love to continue to improve education on health policy. Like I said before, health policy is an incredibly broad topic with a lot of nuances. For example, I think that all residents and physicians should know the basics of health insurance and health care costs, because it directly relates to our patient care. I recently started a health policy curriculum in my residency, and I would love to see this type of education brought to all programs.

SPOTLIGHT ON: HPA Fellows

Jacob Altholz, MD

Health Policy Academy Fellow

WHAT DID YOU GAIN FROM YOUR YEAR-LONG EXPERIENCE AS A HEALTH POLICY ACADEMY FELLOW?

Advocacy as a simple noun can often fail to capture the nuance and complexity of the medical system we operate in. Medical professionals, on some level, are advocating all the time, whether it be for our patients while practicing in an emergency department or for our colleagues sitting in a local meeting. Sometimes it is even larger, advocating for an entire population when representing the profession of medicine to Congress, for example. Even this delineation fails to recognize that there are so many different skills and knowledge-sets that go into advocacy as a verb. It was those kinds of skills I was hoping to build as I applied to the Health Policy Academy just over a year ago.

My experience in advocacy started as a medical student, advocating on behalf of my fellow students and colleagues both at a local level and through the AAMC. Transitioning to residency, I wanted to continue that path and work, and the EMRA/ACEP Health Policy Fellowship was a perfect way to launch me into both learning the skills I wanted and then putting them to use.

WHY WOULD YOU ENCOURAGE OTHERS TO APPLY FOR HEALTH POLICY ACADEMY?

By far the most engaging part of the fellowship was ACEP Council when the Board and Fellows, alongside one another, came together to help represent residents' interests on the national stage. With a vote that counted just as much as anyone else's, we organized, deliberated, and championed the causes we knew would be relevant to our colleagues. That experience alone was worth the fellowship. Those who wish to learn the ins and outs, those who won't shy away from being referred to as a policy wonk, are perfect candidates for the fellowship.

WHAT SPECIFIC POLICY (OR POLICIES) DO YOU HOPE TO FOCUS ON, AND ADVOCATE FOR, AS A DIRECT RESULT OF YOUR INVOLVEMENT IN HEALTH POLICY ACADEMY? IN OTHER WORDS, WHAT ISSUES AFFECTING THE REALM OF EM ARE IMPORTANT TO YOU?

I plan on continuing in this work as much as possible, both on a local and a national level. More than any other issue I am passionate about access to care, hoping to ensure that as many individuals as I can help will have access to timely, affordable health care. Along those same lines, I am passionate about health care operations and health disparities, two separate yet intersecting facets of medicine that can serve to facilitate, or hinder, an individual reaching the care they deserve. It is my hope that the competencies I have gained in the fellowship will help me reach these goals that much more.



SPOTLIGHT ON: HPA Fellows

Kenneth Kim, MD

Health Policy Academy Fellow

WHAT DID YOU GAIN FROM YOUR YEAR-LONG EXPERIENCE AS A HEALTH POLICY ACADEMY FELLOW?

As a Health Policy Academy Fellow, I learned about how democratic organized medicine organizations like EMRA and ACEP are guided by their policy, which is itself derived from their members' resolutions. Through my experience as a member of the Reference Committee at EMRA's Spring Representative Council and as an alternate councilor at ACEP Council, I learned how these resolutions are crafted, edited, and finalized into policy that is sensible and sensitive to the needs and desires of our membership. Equally valuable, I was able to gain and strengthen friendships and connections through EMRA that made me want to run for the director of health policy position in order to give back to the community of EMRA.

WHY WOULD YOU ENCOURAGE OTHERS TO APPLY FOR HEALTH POLICY ACADEMY?

I think one of the highlights of the HPA program is our role as alternate councilors during ACEP Council. While there are other opportunities for residents to get involved via state or section delegations (and if those opportunities arise, you should definitely take them), these councilor positions can be hard to attain, particularly for busy residents who don't always have time to become established leaders in their state. Being invited to help make policy within the largest EM organization in the country at such an early point in our careers was such an honor and so eye-opening for

me. It was especially exciting to hear folks I respect throughout the country talk about how the EMRA delegation was such a strong and respected voice within ACEP Council. As an HPA Fellow, you get to be a part of that!

In addition to this, throughout the year, and particularly at our EMRA conferences, you get to interface with other EMRA leaders and make connections that will last throughout your career in EM. EMRA folks are some of the most passionate, funny, interesting people I know, and if you're on the fence about getting involved, you should get off the fence and absolutely do it!

WHAT SPECIFIC POLICY (OR POLICIES) DO YOU HOPE TO FOCUS ON, AND ADVOCATE FOR, AS A DIRECT RESULT OF YOUR INVOLVEMENT IN HEALTH POLICY ACADEMY? IN OTHER WORDS, WHAT ISSUES AFFECTING THE REALM OF EM ARE IMPORTANT TO YOU?

This past year, as an involved leader in both EMRA and CIR/SEIU (the Committee of Interns and Residents, the largest resident-physician organization in the country), the topic of resident unionization has become increasingly interesting to me.

In addition to this, my main career interest has solidified in the past few years to be an educator who focuses on increasing curricula around health policy in medical schools and residency. I hope that by educating the doctors and trainees on the front lines about our health care

system, we can realign the incentives in that flawed system to prioritize patients and the care we give them rather than the bottom lines of other stakeholders. My time in the HPA has given me insight into not just how to be a better communicator and educator of health policy concepts, but also has allowed me to see by which avenues I can make my career dream a reality.



SPOTLIGHT ON: HPA Fellows

Vishnu Muppala, MD, MPH

Health Policy Academy Fellow

Having a structured environment to learn, explore, and grow outside of medicine is invaluable. Particularly in the hurricane that is residency, it is especially important to be intentional about nurturing these interests. Because of this, I was elated to be accepted as a Health Policy Academy Fellow.

Entering the program, I felt that I was a relative novice with regards to organized medicine and the policy-making process. Building that knowledge was intimidating, but it was made manageable (and even fun?) by our fierce leaders and by being able to do it alongside my co-fellows. When I met them, I found my co-fellows to be bright, charismatic, and passionate. I really loved how we were all so different, and I think that made us a strong team over the last year.

The strength of the fellowship is by far being able to learn from and work alongside physicians who are, and will be, policy leaders in our field. In fact, my greatest growth from last year was almost undoubtedly outside of the formal curriculum. From being in the room with EMRA board members to idle chatting between my co-fellows, I picked up leadership skills and practical applications of them that will, without a doubt, benefit me in my personal and professional life.

I do not say that to diminish the tangible aspects of the formal curriculum; they were substantial. For instance, I previously had tangential interaction with the policy-making process, but many topics related to resolution writing and parliamentary procedure

were inaccessible to me. This was for good reason. I learned that even seasoned veterans of parliamentary procedure found themselves lost, so without formal training, what chance did I have? My co-fellows and I trained on the basics, practiced in simulations, and then applied these skills as the Reference Committee for the EMRA Representative Council meeting at CORD. This learning curve became even steeper when we were tasked with being team leads for policy discussions on ACEP resolutions and alternate councilors for ACEP Council.

ACEP Council was my top highlight of the past year. The environment was exciting, inspiring, and chaotic. I had never seen so many doctors in one room. Even crazier is that all of them were policy-oriented emergency physicians. I was fascinated to learn about their ideological and practice diversity as we all discussed ACEP policy. At Council's conclusion, seeing the formalized policy and being a part of its creation reinforced the deep respect I had picked up throughout the year for the importance and power of policy in arenas such as the one that I had just participated in.

Each of us in our careers as emergency providers will be directly affected by policy. My involvement with it will be determined in the future, but at the very least I now feel that I have a deeper understanding for its development and implementation. My interests are generally in community-based health interventions and how we can use the



emergency department to promote health equity through improving access. The past year has equipped me with additional tools to be an effective advocate through a more comprehensive understanding of the language and pathways through which strong policy must be achieved.

Overall, I gained skills, experiences, friends, role models, and a great deal more as a Health Policy Academy Fellow. I found the program to be effective in its education and flexible to individual interests. For me, it has been a powerful steppingstone that will undoubtedly assist me with my goals as an aspiring emergency physician and health advocate.



Register Today for CORD Academic Assembly

Emergency medicine’s leading academic conference is almost here, and EMRA’s got you covered with plenty of can’t-miss events. EMRA members are required to register for CORD23 in order to attend EMRA events, so register today, don’t delay!
Visit emra.org/cord for up-to-date EMRA programming.

SCHEDULE OF EMRA EVENTS

Monday, March 13

6 pm CT Resolution Review
(Virtual)

Monday, March 20

10am-12pm PT EMRA Medical Student Council Meeting
(Executive Session)

1-6pm PT EMRA Committee Meetings

7-8:30pm PT EMRA Leader Meet Up
(invitation only)

Tuesday, March 21

9:30am-12:30pm PT EMRA Leadership Academy

4-6pm PT EMRA Quiz Show

Wednesday, March 22

7-8am PT EMRA Representative Council Breakfast & Credentialing

8am-1pm PT EMRA Representative Council Meeting



Caesars Palace, Las Vegas, NV
March 21-24, 2023

A Call for Resolutions...

EMRA Resolution Review

A resolution is a directive for EMRA to take a certain action or to form policy. Make a difference to your specialty by authoring a resolution for the EMRA Rep Council! Write a resolution using our EMRA guidelines, and submit via our online portal.

Deadline to submit resolutions is Feb. 4, 2023.
Resolution Review will take place virtually
on Monday, March 13, at 6 pm Central.

(Check emra.org/events for updates)



emra.org/be-involved and emra.org/events

Announcing...

EMRA Representative Council *Spring 2023 Meeting*

The EMRA Representative Council (RepCo) addresses issues relating to all aspects of EM residency training and adopts policies affecting professional development, practice, patients, and the specialty. RepCo includes a representative from every EM program and is led by two council officers who preside over council meetings, organize council activities, serve as the ex-officio chairs of all RepCo committees, and represent the membership to the Board of Directors.

RepCo's next meeting will take place this spring during EMRA events at CORD Academic Assembly.

March 22, 2023

CORD Academic Assembly in Las Vegas



for more info



*Are you interested in being your program's RepCo representative?
Find out more at emra.org/repco.*

EMRA QUIZ SHOW



Challenging medical conundrums, wacky graphics, fun and games with a little pop culture thrown in for good measure.

Who knows their stuff and can think fast?

Come find out at the EMRA Quiz Show!

*This is a popcorn-throwing,
crank-up-the-music,
guaranteed-fun event.*

March 21, 2023

CORD Academic Assembly
in Las Vegas



RoshReview

Thank you to Rosh Review for supporting this event



#EMRAQuizShow

emra.org/quiz-show

THE DROP MIC



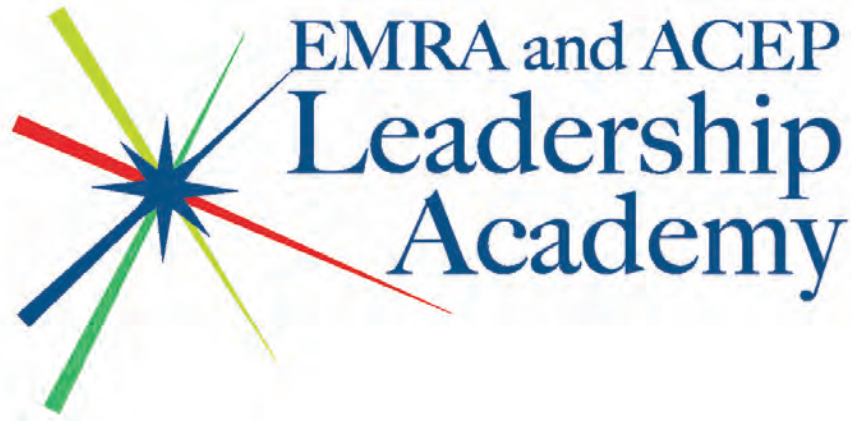
TED Talk-style, Mini-Lecture Event
Engaging, Talented Speakers
Health Policy and Emergency Medicine

Drop the Mic Advocacy Lectures
EMRA/YPS Health Policy Primer
Sunday, April 30, 2023

Grand Hyatt • Washington, D.C.
ACEP Leadership & Advocacy Conference 2023



emra.org/leadership-advocacy-conference
[#EMRADroptheMic](https://twitter.com/EMRADroptheMic)



EMRA and ACEP Leadership Academy

WELCOME
Class of 2024

CONGRATULATIONS
Class of 2023

Class of '24 inductees will be recognized and the graduating Class of '23 will be honored during EMRA events at



CORD Academic Assembly, March 21-24 in Las Vegas



Leadership Academy is a 1-year professional development program and virtual community for emerging leaders in emergency medicine.

Applications for the new class close on **Dec. 1 each year.**
You must be an MS4 or above to be eligible.



Thank you to Vapotherm for supporting the EMRA/ACEP Leadership Academy



#EMRAACEP

emra.org/leadership-academy

Thank You... 

We appreciate the support
for our EMRA Events at CORDAA23



... for supporting
EMRA

THE PORTABLE SIM GYM: An Eye-Opening Tool in Medical Education

Kandria Ledesma, MD

Resident, PGY-3
Emergency Medicine
St. Joseph's Medical Center, Stockton, CA

Matthew Kiefer, MD

Core Faculty, Director of Simulation
Emergency Medicine
St. Joseph's Medical Center, Stockton, CA

Yasamin Soltanianzadeh, MD

Core Faculty, Simulation Faculty
Emergency Medicine
St. Joseph's Medical Center - Stockton, CA



The art of on-shift teaching is a skill that many attendings struggle with and aim to master, especially during a busy shift.

Limited research on this topic shows that approximately 6-20% of attendings teach during a shift. Even fewer studies characterize their teaching methods. One study showed that 25% of attendings taught on shift, with a majority of their techniques involving implicit teaching during patient-care discussions. While this is an important approach, we believe that providing additional tools for educators can enhance medical education.

Enter: The “Sim Gym.” It’s a novel concept — a portable task trainer for explicit, dedicated teaching of EM

procedures.

Although published data on in-situ procedure training is limited, one study within U.K. medical literature highlighted a “tea trolley” being brought into an anesthesia resident workroom to teach residents difficult airway skills.

We felt that a similar concept could be used in our ED by utilizing a portable trainer to teach procedures. We started with the lateral canthotomy. Lateral canthotomy is an example of a low-frequency, but high-risk, procedure that emergency physicians need to feel comfortable to perform. We wanted to improve the proficiency in performing a lateral canthotomy in the emergency department, as well as review indications and contraindications for this procedure.

Due to limited real-patient experience of this type of procedure during a typical EM residency, it lends itself well to simulated training. The Sim Gym, as a portable task trainer, can easily be accessed during shifts to serve as an additional tool for educators and allow hands-on training for procedures such as the lateral canthotomy.

DESIGN

GOAL: Create a portable, low-fidelity lateral canthotomy model, train residents while working on shift, and collect pre- and post-intervention data on proficiency.

ELIGIBILITY: All emergency medicine residents (PGY1-PGY3) working in the emergency department around 12 pm on Jan. 31, 2022, and Feb. 1, 2022.

PRE-INTERVENTION: A qualitative discussion assessing knowledge of indications, complications, and contraindications was performed prior to the intervention.

INTERVENTION:

- Over the course of two emergency department shifts (11 am-9 pm), 11 PGY1-3 EM residents participated in a 10-15 minute, one-on-one simulated session involving performing a lateral canthotomy.
- A simulation case was created involving a trauma where a lateral canthotomy was indicated.
- We created a Sim Gym that had multiple low-fidelity lateral canthotomy models using halloween masks, ping pong balls, and sutured in hair ties as described in the Nadir et al paper.

POST-INTERVENTION:

- A SurveyMonkey questionnaire consisting of seven questions was

completed by participating residents after the intervention to assess knowledge retention.

- An educational guide was emailed to all participating residents discussing indications, complications, contraindications, and procedure steps for a lateral canthotomy.

RESULTS

The post-intervention questionnaire included inquiries regarding comfort level of performing a lateral canthotomy; indications, contraindications and complications of the procedure; usefulness of the model; usefulness for on-shift education; and additional feedback. (See Table 1.)

Additional feedback from our study's resident-participants included, "Consider hosting 'sim gym' training during a less busy clinical time," and, "Consider distribution of a smart-card that outlines the highlights of the procedure" to facilitate retention.

DISCUSSION

In medical education, simulation is a useful tool that encourages team building and problem solving in a safe environment. Although simulation occurs every month during our formal scheduled didactic sessions in the St. Joseph's Medical Center Sim Lab, mock in-situs and on-shift simulation-based teaching are beneficial adjuncts. The theory behind these on-shift events is that training in the actual ED increases

fidelity, provides a unique experience that triggers memory formation and future recall, improves patient safety, and serves as a fun and enjoyable outlet during otherwise stressful patient-care activities.

During our two-day intervention, there was significant improvement in the comfort level of EM residents performing a lateral canthotomy, ranging from 36-64% feeling somewhat to very confident. During the pre-intervention discussion, all residents stated they had never performed one in their training to date.

All residents knew the indications for a lateral canthotomy. There was a 2.3-fold improvement (from 36% to 82% of residents) in knowing contraindications for lateral canthotomy. In addition, after the Sim Gym intervention, there was a 4.6-fold increase (from 11% to 82% of residents) in knowing the complications of a lateral canthotomy.

Residents reported that their comfort level improved after the simulation exercise, and knowledge of the procedure was generally high as ascertained on the post-intervention survey.

LIMITATIONS

Limitations of this study included the small sample size as well as the short duration of time over which this study was conducted. In addition, the pre-survey data was collected through an informal discussion during the intervention, as opposed to through a formal survey.

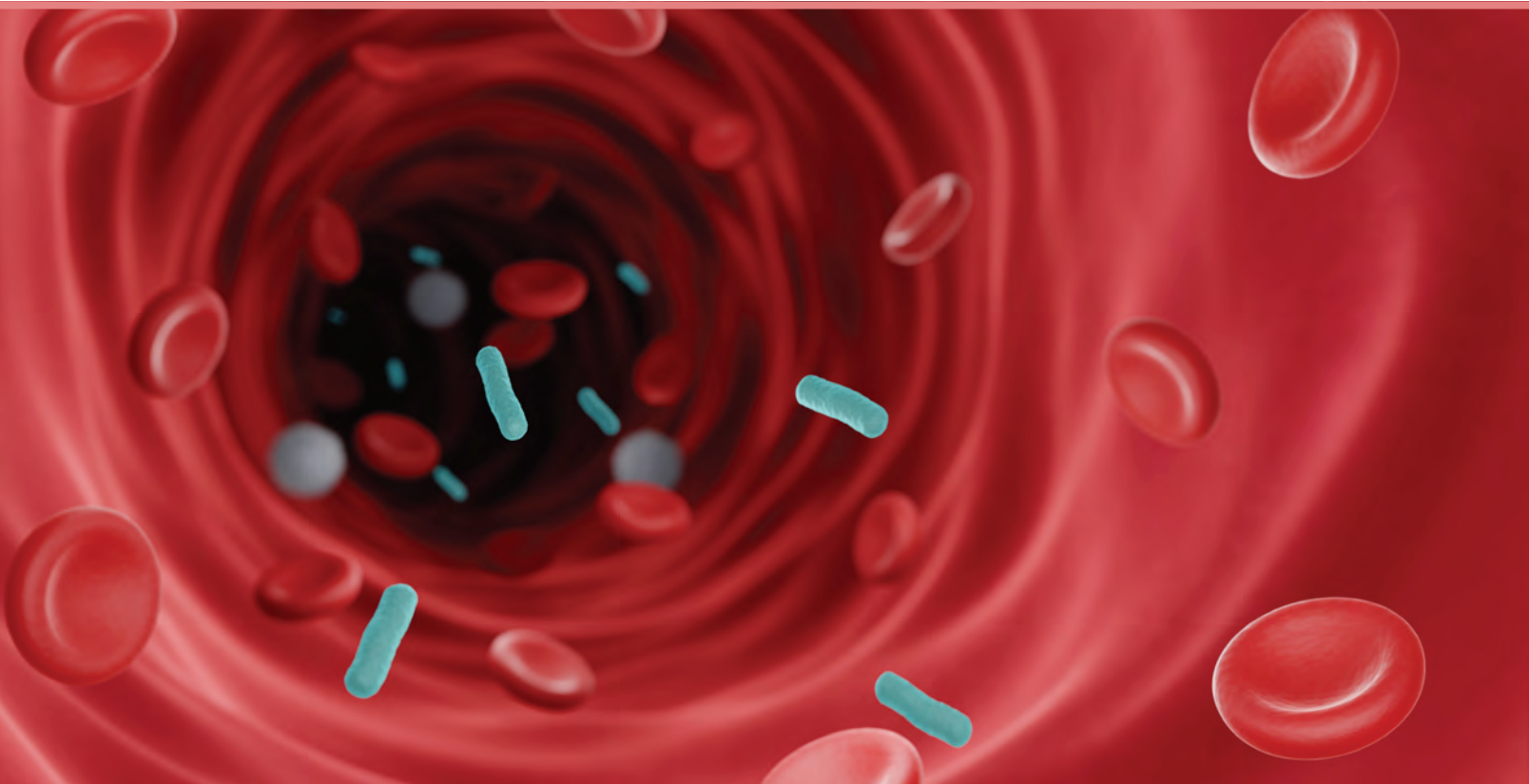


CONCLUSION

The portable Sim Gym is a novel and innovative modality that facilitates dedicated, on-shift resident education and provides a tangible resource that attendings can use for explicit teaching. This versatile, portable trainer can be used for various EM procedures. It would be especially useful in training for low-frequency/high-risk procedures and would encourage increased exposure, repetition, and memory retention. Future studies could include retention and proficiency in other EM procedures, more qualitative pre-intervention collection of data, a larger sample size through a longer period of time, and feedback from on-shift attending physicians to assess the feasibility and usefulness of the task trainer. ★

TABLE 1: Knowledge and proficiency in EM residents (n=11) pre- and post-intervention.

SURVEY QUESTION	PRE-SURVEY (N = 11)	POST-SURVEY (N =11)
Indications for lateral canthotomy	100%	100%
Contraindications	36%	82%
Complications	18%	82%
Usefulness of procedure model	0%	45% extremely 27% very useful 27% somewhat useful
Comfort level after workshop	0%	64% very confident 36% somewhat confident
Usefulness for on-shift resident education	N/A	18% extremely useful 55% very useful 27% somewhat useful



Sepsis Alert: Care Pathways in the ED

Amelia R. Barber, MD

Resident, PGY-4
Emergency Medicine
University of Colorado School of Medicine

Keasha N. Kuhnen, DO

Attending Physician
Emergency Medicine
University of Colorado School of Medicine

Sepsis is life-threatening, multi-system organ failure caused by dysregulation of immune response to infection. It causes mortality in as many as 25% of cases.¹

Sepsis is common. As many as 75% of sepsis cases are seen in the emergency department.² Care pathways and algorithms utilizing different systemic inflammatory response syndrome (SIRS) criteria to establish sepsis alerts in EDs have been widely implemented in hopes of improving patient care.² These care pathways are important because, in some cases, they save lives.

The main pathways for sepsis identification are automated triage criteria, care teams, and sepsis pathways. Sepsis pathways are the most integrative but ultimately rely on clinical assessment and reassessment.³

Sepsis identification tools have many criticisms and vulnerabilities. Common

criticisms include: lack of sensitivity and/or specificity; differing criteria commonly used in different departments and over time; utility of sepsis care pathways that ultimately rely on clinical assessment among specialty-trained emergency physicians; and vulnerabilities of overtreatment and alert fatigue.³

A systematic review showed consistently high negative predictive value (99-100%); meanwhile, it found highly variable sensitivity (10-100%), specificity (78-99%), positive predictive value (5.8-54%), and primary outcomes (time to antibiotics, length of stay, and improved mortality).¹

Another study showed that computer alerts identifying sepsis patients with >2 SIRS criteria in the ED increased lactate testing, but had no change in inpatient mortality.⁵

The value of different sepsis care pathways has been a major area

of research and discussion among clinicians. This has caused large variability in care pathway utilization and differing criteria: SIRS, CMS, Surviving Sepsis Campaign, qSOFA, SOFA, Sepsis 3, Shapiro criteria, CEC SEPSIS KILLS, and differing hospital-based pathways, to name a few.^{6,7}

Currently, the most widely accepted criteria is Sepsis 3, which establishes SIRS as the most sensitive sepsis criteria and qSOFA as more specific to sepsis.^{6,8,9,10} Sepsis 3 also eliminated the prior “severe sepsis” classification as redundant nomenclature. Sepsis 3 defines septic shock as end-organ damage based on refractory hypotension (>65mmHg MAP without vasopressors) or initial elevated lactate (>2.0 mmol/L (18 mg/dL).

Septic shock is an important distinction from sepsis as it is associated with a significant increase in mortality up

to 40%.¹⁰ Sepsis 3 also recommends use of a SOFA score (different than qSOFA) to calculate mortality risk once sepsis is diagnosed.^{8,10}

Based on the variation of criteria, likely all are suboptimal for use in the emergency setting, and most include phrases that rely on clinician assessment, such as: “Clinicians should not be restricted to definition criteria when evaluating patients with infection and should wisely use the broad array of information obtained by rigorous clinical observation.”^{7,10}

CASE REPORT

Our patient was a previously healthy 24-year-old male brought in by ambulance for one day of shortness of breath, productive cough, and fever. A sepsis alert was activated by EMS.

The patient reportedly had an upper respiratory infection (URI) two weeks ago. A SARS-Cov-2 test was negative. He reported feeling better after a week, and then feeling sick again the night prior. He tried two puffs of his albuterol inhaler, given for his URI, took Nyquil, and went to bed.

He called 911 in the morning for increasing shortness of breath and cough. EMS found the patient to have an oxygen saturation of 80% on room air, and 92% on 4 liters of oxygen by nasal cannula. The patient said he had chest discomfort, which he described as shortness of breath rather than pain. He denied chills, rhinorrhea, sore throat, leg swelling, abdominal pain, dysuria, joint swelling, myalgias, or rash.

The patient reported having left foot surgery six weeks prior for an ankle fracture. Upon examination, no acute tenderness to the left foot was found. There was no history of pneumonia, and the patient denied personal and family history of clotting. He had received two SARS-Cov-2 vaccines. A review of systems was positive for pallor, but otherwise negative.

On presentation, the patient’s vital signs were: blood pressure 97/63 mmHg; pulse 138; temperature 37.7 C (99.8 F); respiratory rate 28; oxygen saturation 92% on 4 liters oxygen via nasal cannula; height 1.778m (5’10”); weight 83.9 (185

lbs); and BMI 26.54 kg/m².

On physical exam, the patient was in acute respiratory distress and toxic appearing. He was tachycardic and tachypneic; normal rhythm, S1 and S2 heard, no friction rub, murmurs, or gallops. He had chest wall tenderness and bilateral rhonchi; no wheezes or stridor. He had a flat, nontender abdomen, with normal bowel sounds. His left foot was mildly tender to dorsiflexion (recent left foot surgery). There was no erythema, bruising, warmth, or color change; range of motion was intact. There was upper left thigh tenderness to palpation; no redness or swelling. Skin was pale and dry with 3-second capillary refill. The patient was alert and oriented, with no focal neurologic deficit.

This patient met SIRS criteria. Sepsis order set — including blood cultures, lactate, and IV Rocephin — was ordered. EKG, troponin, CXR, and UA: EKG returned with sinus tachycardia; WBC 14.4 with left shift. A complete metabolic panel was within normal limits and SARS-Cov-2 negative. Troponin was elevated to 0.07, indicating heart



Computed tomography angiography. IMPRESSION: (1) Extensive bilateral pulmonary emboli involving the central and peripheral pulmonary tree system. There is mild straightening of the interventricular septum, which may represent increased right heart pressures. No dilatation of the pulmonary trunk is identified. (2) Focal consolidations in the bilateral upper lungs and left lower lung. This may represent a multifocal infectious process versus sequelae of pulmonary infarcts.

strain. Lactate was within normal limits at 1.66. CXR returned without acute process. A CT angiogram was ordered for pulmonary embolus evaluation. Wells’ criteria placed him in the moderate risk group.

During CTA, the patient required increasing oxygen to 8L with 87% oxygen saturation. BP was 126/64. The CTA showed bilateral massive PE with left lower lobe consolidation. Pulmonology and IR were consulted.

Oxygen requirement increased to 60L/min at 80% FiO₂ by Airvo. Pulmonology recommended heparin and procedure for thrombectomy versus catheter-directed thrombolysis. The patient was accepted to the ICU. He was notified and re-questioned for clot risk. The patient reported groin pain starting two weeks ago at the time of his URI; surgery to left foot was six weeks ago.

The patient subsequently underwent thrombectomy with inferior vena cava filter placement and lower extremity ultrasound that revealed a left femoral deep vein thrombosis. He was admitted to the ICU and placed on heparin to dissolve the femoral clot.

DISCUSSION

This case report emphasizes clinical decision pathways and potential outcomes of the emergency physician’s clinical reasoning.

This patient met SIRS criteria for tachycardia, hypotension, fever, and WBC 14.4 with left shift. He initially met sepsis criteria with a suspected source of pneumonia based on recent history of upper respiratory infection, physical exam finding of rhonchi, and non-specific consolidation seen on chest X-ray.

He no longer met criteria after sepsis laboratory testing demonstrated no organ dysfunction.

Based on his increasing oxygen requirement, a CT angiogram was ordered to evaluate for pulmonary embolism, which was ultimately diagnosed. This was a previously healthy 24-year-old male whose only risk factor for pulmonary embolus was ankle surgery six weeks prior to presentation.

Did common sepsis care pathways



improve or hinder his care?

Are there different types of care pathways that could have been better applied to this patient?

What role should clinical care pathways play in diagnosis of life-threatening conditions?

Sepsis alert criteria is a well-validated, performance-based measure. This allows for prompt treatment with antibiotics, which has been shown to improve morbidity and mortality of sepsis.³ It's important to note that performance-based measures depend on arriving at the final diagnosis of sepsis. If a patient presents with a chief complaint non-specific to sepsis and is ultimately found not to be septic, these alerts do not inform treatment.

As discussed above, criteria to enter sepsis care pathways are highly sensitive, but non-specific. This methodology neglects the quintessential job of an emergency physician — to triage undifferentiated complaints for diagnosis and treatment decisions with limited information. Diagnosis-based performance measures don't capture the risk stratification of this task, concomitant evaluation of multiple life-threatening diagnoses, or patients for whom a diagnosis was considered but safely ruled out.³

Chief complaint-based measures are a potential solution when applied to the correct patient population.³ One such example is the use of EKG and counseling on smoking cessation

in the evaluation of chest pain in the ED. This represents a diagnostic and population-based intervention applied to a chief complaint.³ Our patient may have benefited from a chief-complaint based performance measure, as he had shortness of breath with mixed risk factors for separate life-threatening diagnoses: sepsis and PE.

Some limitations of chief-complaint based measures are the discrepancy in labeling of the chief complaint.³ This may include DSM diagnoses vs. common language chief complaints, provider discrepancy between similar chief complaints (shortness of breath vs. dyspnea), or separate but related chief complaints.³

Another criticism discussed in the literature is the utility of care pathways among emergency physicians. Historically, non-emergency physicians — trained in another specialty such as family medicine or internal medicine — staffed the ED. Concomitantly, sepsis was often a missed or delayed diagnosis. Interprofessional differences in perception of causes for delayed diagnosis led to the suggestion of written protocols.¹⁵ Sepsis recognition has since evolved via robust education campaigns, research, quality improvement measures, increased board certification of emergency providers, ED personnel training, and integration of sepsis alerts/care pathways into electronic medical records.² Some suggest emergency physicians are likely much better at

detecting sepsis, and in the highly monitored ED setting, the benefit of care pathways over clinician gestalt may diminish.²

LIMITATIONS

Many studies have shown mortality benefit from early recognition and treatment of sepsis. There is extensive conflicting research on whether sepsis alerts in the emergency department setting confer decreased mortality. There are many process-of-care measures conferring improvement with implementation of sepsis care pathways; however, high-quality studies have been unable to reliably show a mortality benefit when implemented across all patient care.² Sepsis alerts demonstrate utility, but further research is needed to identify their utility in emergency departments and build a more ideal alert system.

CONCLUSION

Care pathways were originally implemented to facilitate prompt diagnosis of sepsis in order to implement life-saving treatment. Since their original construction, there have been numerous conflicting methods of implementation and criteria based on debate of sensitivity, specificity, and utilization in different emergency departments. There is also some evidence that well-trained ED personnel need not rely on care pathways for recognition of sepsis to improve mortality. More critically, care pathways may neglect the core competencies of the board-certified emergency physician to recognize life-threatening diagnoses while maintaining a broad differential diagnosis and implement treatment based on limited information.

Discussion of chief complaint-based protocols are a potential solution to better optimize sepsis care pathways in the ED. Further research is needed to establish the most optimal utilization of sepsis care pathways. Extension of this discussion to other care pathways is recommended to further patient care in an emergency setting. ★



Pilot Study: Evaluating Education Targeting Intimate Partner Violence, Human Trafficking in an EM Residency

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ABSTRACT

Intimate partner violence (IPV) is a pattern of abusive behaviors against a victim perpetrated by someone who is, or was, in an intimate relationship with the victim.¹

Human trafficking (HT) is “the use of force, fraud, or coercion to compel a person into commercial sex acts or labor or services against his or her will.” Inducing a minor into commercial sex is considered HT regardless of the presence of force, fraud, or coercion.²

IPV and HT are major causes of morbidity and mortality in the United States. Many victims will seek medical care, often in the ED. This puts emergency physicians in a position to identify and help victims get the help they need to escape these dangerous situations.

In this pilot study, we evaluated the effectiveness of resident education on identifying and appropriately managing victims of IPV and HT in the ED. We

assessed residents’ abilities to utilize appropriate resources to help these patients. We also gauged residents’ comfort level in managing these patients after receiving our pilot curriculum. As measured by our pre- and post-survey data, residents expressed significant improvement in knowledge about IPV and HT, as well as higher comfort level in assessing these patients. Our hope is that this pilot project will provide a strong foundation for future projects and strengthen resource availability and utilization for these vulnerable populations.

INTRODUCTION

For those experiencing IPV or HT, interaction with the health care system may be their only opportunity to seek help. Unfortunately, most health care workers have little training on how to identify and help these patients. Studies demonstrate that health care professionals are not comfortable with

Appendix A
Partial Data Analysis of Pre- and Post-Survey Results

		Pre-frequency	Percent	Post-Frequency	Percent	P
<i>Which best describes how prepared you feel to perform the following?</i> <i>- Ask appropriate questions about intimate partner violence</i>	Neutral or not prepared	26	70.27	7	24.14	0.0002
	Prepared	11	29.73	22	75.86	
<i>Which best describes how prepared you feel to perform the following?</i> <i>- Ask appropriate questions about human trafficking</i>	Neutral or not prepared	37	100	10	34.48	<.0001
	Prepared	0	0	19	65.52	
<i>Which best describes how prepared you feel to perform the following?</i> <i>- Appropriately respond to disclosures of abuse</i>	Neutral or not prepared	30	83.33	6	20.69	<.0001
	Prepared	6	16.67	23	79.31	
<i>Which best describes how prepared you feel to perform the following?</i> <i>- Identify intimate partner violence/human trafficking indicators on physical exam</i>	Neutral or not prepared	30	81.08	7	24.14	<.0001
	Prepared	7	18.92	22	75.86	
<i>Which best describes how prepared you feel to perform the following?</i> <i>- Document intimate partner violence/human trafficking history and physical exam findings in the patient's chart</i>	Neutral or not prepared	34	91.89	9	31.03	<.0001
	Prepared	3	8.11	20	68.97	
<i>Which best describes how prepared you feel to perform the following?</i> <i>- Make appropriate referrals for intimate partner violence and human trafficking</i>	Neutral or not prepared	34	91.89	12	41.38	<.0001
	Prepared	3	8.11	17	58.62	

APPENDIX A

diagnosis and management for a variety of reasons including lack of standardized screening, confusion about their role in management, and lack of awareness.^{3,4} Other noted constraining factors include, but are not limited to, insufficient time with patients, lack of follow-up, partner or family members in the room, and fear of discussing IPV with patients.⁵ Of note, associations between health care professionals' demographics and their performance regarding domestic violence appear to be limited to age, professional experience, and economic status.⁶

Increasingly, medical schools

have employed different strategies in an attempt to increase confidence in recognizing and treating IPV and HT. Numerous educational models have been tested including in-person training, online learning modules, and standardized patient interactions. Results overwhelmingly show that, after training, health care workers increase their diagnostic confidence and abilities regardless of the educational modality.⁷⁻¹²

To facilitate nationwide education on HT, many organizations have created educational materials for implementation in multiple settings. The Department

of Health and Human Services, for example, developed "Stop Observe Ask Respond," or SOAR, in 2013 specifically for use in health care settings.

METHODS AND MATERIALS

This was a prospective quasi-experimental study consisting of all residents of the Creighton University School of Medicine (Phoenix) EM program for the July 2021-June 2022 academic year.

Residents received four lectures on the signs, symptoms, and epidemiology of IPV and HT, as well as the importance of addressing IPV and HT in the ED. Lecture topics included general background on IPV and HT; information on identifying potential victims of IPV or HT; red flags of patient encounters; prevalence in Maricopa County, AZ; tips on working with these patient populations; information on the Sexual Assault Nurse Exam (SANE); and available resources in Maricopa County. These lectures occurred during regularly scheduled protected conference time. They consisted of slide-deck presentations with open discussion, ranging from 15-minute to 1-hour sessions. The curriculum addressed identifying and appropriately counseling patients who may be victims of IPV or HT, as well as reviewing appropriate resources for these patients.

Residents took an identical pre- and post-intervention survey before and after receiving the curriculum to assess if it improved resident knowledge of IPV and HT. Our survey was developed using a similar survey by Short et. al. in their paper titled, "A tool for measuring physician readiness to manage intimate partner violence."¹³ Additional questions were created to assess for HT knowledge. The survey consisted of 17 questions with Likert scales.

RESULTS

There were 37 responses to the pre-survey and 32 responses to the post-survey. An unmatched chi-squared test was done on all 17 questions. It showed a significant difference in the pre- and post-testing knowledge transfer for all questions with a P value of 0.0002 or

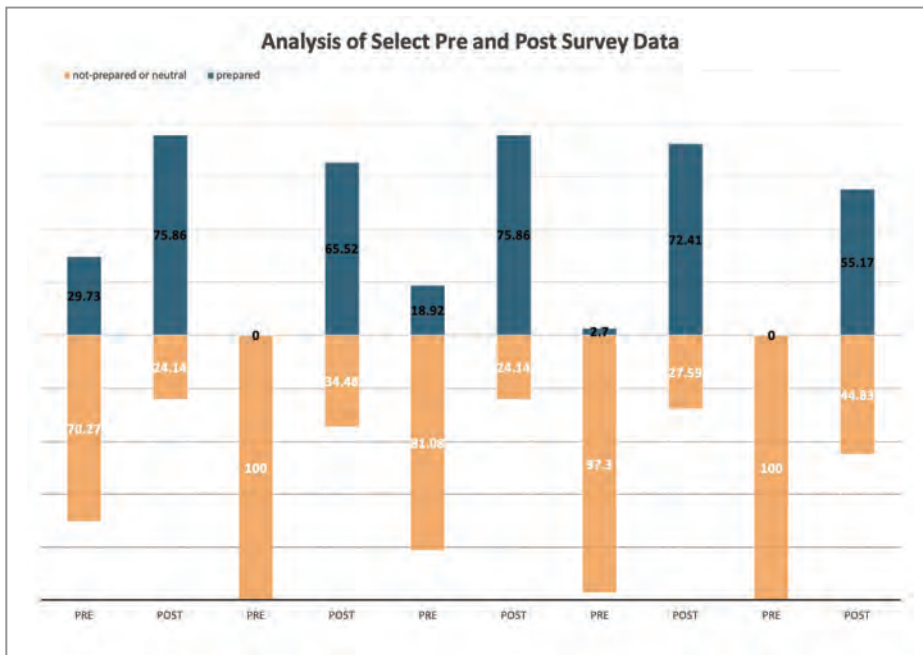


FIGURE 1: A sample of pre- and post-data analysis from selected questions

less for all questions. (See Figure 1 and Appendix A on emresident.org for full data analysis.)

DISCUSSION

At the time of this writing, training on IPV recognition is not a curriculum requirement for graduation from EM residencies in the United States, even though many victims come through ED doors every day across the country.³⁻⁵ The importance of recognizing these victims, and the large potential margin for impact, cannot be emphasized enough.

Our data is limited to one residency program, and strict generalizability to all residency programs is neither appropriate nor our goal in this writing. However, the unfamiliarity with the nuances of recognizing and treating these patients is not unique to this one residency program.^{4,5}

Our study highlights a method of education that was proven to be effective with our cohort. The takeaway from this is twofold: (1) We were able to improve literacy in IPV and HT with our own cohort in a comprehensive fashion using what we consider a reasonable amount of resources and time, with measurable outcome; (2) We recognize a huge need to continue with, and contribute to,

the discussion of improving medical education so emergency physicians can properly care for these marginalized groups.

Our methods can be taken as an example. We want to inspire other training programs to find innovative ways to adjust, add on, or revamp modes of education, seeing that our methods worked. (Limitations of this study and its results include variability in resident attendance over the lecture series. Additionally, not all residents provided responses, and the data was not paired, therefore making our pool of data smaller than anticipated.)

Multiple studies within emergency medicine^{4,5,7,8,9,14} as well as other specialties¹² have addressed this issue. Innovative methods included simulation,¹⁰ online learning modules,^{7,8} hired multidisciplinary teams,⁹ and checklist utilization,¹ among others. We applaud these efforts and strive to join these leaders to improve our care of IPV and HT victims.

We plan to continue our education series, with existing and updated curriculum, as new residents join our team. While these efforts cannot be measured and published in this pre- and post-hoc analysis, it is reasonable to assume that these efforts will contribute



meaningfully to diversify and continue resident education on IPV and HT. This also opens up potential interventions that may also be studied among our cohort in the future.

As a team of educators and researchers, we hope to have equipped readers with tools for respective cohorts around the world. While it is dispiriting to hear how vast and seemingly uncontrolled IPV and HT are, it is reassuring to see efforts made to address them, with measurable improvements. Ultimately, as bedside care providers, we are some of our patients' most impactful advocates, and we should take pride in that position. As the old adage says, with great power comes great responsibility. As a reader of this article, you already have taken on that responsibility and shown that initiative. We look forward to reading or hearing of other innovative ways emergency physicians are addressing this problem that has plagued our communities for far too long. ★

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A Case of Intentional Salt Ingestion Leading to Life-Threatening Hyponatremia

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Acute salt ingestion should be rapidly corrected to reduce serum osmolality. This can be done with an infusion of hypotonic solutions, such as 5% dextrose in water (D5W), with a goal reduction of 1 mmol/L/hr. Isotonic solutions should not be used unless the patient is hemodynamically unstable and requires volume expansion. Other methods such as hemodialysis have also been used to rapidly correct sodium levels, with good neurological outcomes.

BACKGROUND

Hyponatremia, a high concentration of sodium in the blood, is not usually caused by an intentional salt overdose. More commonly, hyponatremia is caused by free water losses due to either decreased water intake or excessive gastrointestinal or renal losses. As little as 25 grams, or fewer than 4 tablespoons of salt, has been lethal in adults.¹ Lethal salt ingestion has occurred when salt is used as an antiemetic, confused for sugar, or used in suicide attempts.²

CASE REPORT

A 22-year-old male was brought into the ED by emergency medical services (EMS) due to altered mental status and seizures. The patient's landlord called EMS after finding him unresponsive in his bedroom surrounded by white powder and an empty bottle of salt (NaCl) tablets. The landlord informed EMS that the patient possibly was being treated for a "mineral disorder." No further medical history or collateral information was available at the time. EMS treated his seizure successfully with midazolam and transported the patient.

In the ED, the patient's eyes were open with minimally reactive, 5 mm pupils bilaterally. He was nonverbal and withdrew to painful stimuli. There was no evidence of continued seizure activity. His initial vital signs were blood pressure of 153/110 mm Hg, heart rate of 130 beats/min, respiratory rate of 21 breaths/min, oxygen saturation of 98% on a non-rebreather, and a temperature of 37.2°C. The remainder of his physical exam was notable only for dry mucous membranes.

Due to his altered mental status, concern for airway protection, and need for extensive medical work-up, the decision was made to intubate the patient. The venous blood gas sample shortly returned with a mild acidosis of 7.23, pCO₂ of 53 mm Hg, pO₂ of 39 mmHg, and bicarbonate of 21.7 mmol/L. Our venous blood gasses included electrolytes which showed critical sodium of 198 mmol/L, chloride above detectable ranges, glucose of 167 mg/dL, and lactate of 3.3 mmol/L.

Subsequently, the patient's basic metabolic panel confirmed the diagnosis of severe hyponatremia with sodium >180 mmol/L. Additional blood tests were notable for a serum osmolality of 415 mOsm/kg, an AKI, and mild leukocytosis. His head CT without contrast was concerning for peripheral subarachnoid hemorrhages.

DISCUSSION

In the ED, hyponatremia is generally due to free water losses and volume depletion. Less frequently, it is a consequence of excessive sodium intake. Historically, salt has been used as an antiemetic, which has led to several deaths. Other fatal cases have included mistaking salt for sugar and the ritual use of salt in exorcisms.¹ In animal models, the LD₅₀ (lethal dose in 50% of animals) of salt is 3g/kg, but significantly lower doses have been fatal in humans.³ In large ingestions, sodium chloride is rapidly absorbed through the GI system, overwhelming its renal excretion. If there is no additional free water intake, the patient will become increasingly

hyponatremic.⁴

Patients with acute hyponatremia can present with encephalopathy, seizures, and focal neurological deficits. Central nervous system (CNS) effects predominate as the brain is especially sensitive to the tonicity changes associated with acute hyponatremia. The increased tonicity can result in osmotic demyelination syndrome (ODS) due to damage to oligodendrocytes.⁵ More commonly, ODS occurs in the setting of rapid correction of hyponatremia; however, it has also been reported in acute salt ingestion.^{6,7} The pons is more susceptible to these osmotic changes and



is frequently involved in ODS.

Unfortunately, diagnosis is often delayed after the initial insult due to the lag of symptom onset. It is usually diagnosed after an MRI shows demyelinating disease consistent with ODS and carries a poor prognosis with no clear treatments.⁵ This highlights the importance of well-controlled sodium correction, which requires frequent monitoring every 2-4 hours in the acute phase.

Acute hyponatremia is also associated with intracranial hemorrhage, which can be another contributor to altered mental status and seizures.⁸ In the setting of high tonicity, neurons shrink in size to achieve osmotic equilibrium with the extracellular space. This leads to the retraction of cerebral tissue, causing shear stress on blood vessels and hemorrhage.

Generally, acute salt ingestion should be rapidly corrected to reduce serum osmolality. This can be done with an infusion of hypotonic solutions, such as 5% dextrose in water (D5W), with a goal reduction of 1 mmol/L/hr.⁹ Isotonic solutions should not be used unless the patient is hemodynamically unstable and requires volume expansion.

Other methods such as hemodialysis have also been used to rapidly correct sodium levels, with good neurological outcomes.¹⁰

In this case, there was concern for a more subacute ingestion, given the patient's history of an unknown mineral disorder treated with salt tablets. Therefore, rapid correction could result in significant brain edema. Over time, the brain parenchyma equilibrates to the higher extracellular osmolality by increasing intracellular osmoles, restoring normal cellular volumes.¹¹ In cases of chronic hyponatremia, sodium should be reduced no more than 10 mmol/L/day with enteric free water or hypotonic solutions.⁹ If this is not done, the osmotic gradient will drive free water into the hyperosmotic cells, leading to increased cellular volume and brain edema.

CASE RESOLUTION

After discussions with toxicology and nephrology, the patient's sodium was slowly corrected with a D5W infusion after an initial D5W bolus. While in the ED, the patient was identified and was found to have a history of attention-deficit/hyperactivity disorder and

anxiety. Notably, he was evaluated in the ED three months prior for persistent nausea and self-reported concerns that he had a "mineral imbalance." The patient had purchased supplements to fix his imbalance despite having normal labs, including sodium, at that time.

Given the concern of chronic salt ingestion leading to longstanding hyponatremia, the decision was made to slowly correct the patient's hyponatremia. He was admitted to the medical intensive care unit on a D5W infusion. His sodium was slowly corrected with a D5W infusion and enteric free water flushes. An MRI, with and without contrast, of his brain was done, which unfortunately showed pontine and extrapontine osmotic demyelination consistent with ODS. It also demonstrated cerebral edema and subarachnoid hemorrhage. His sodium normalized on hospital day nine, and he was extubated. After a prolonged hospital course, he was discharged to a short-term rehab facility. At the point of discharge, the patient was noted to have mild lower extremity weakness and an unsteady gait due to mild truncal ataxia. The patient was also noted to have a flat affect but was cognitively intact. ★





Oh Snap! Ketamine-Induced Laryngospasm in an Adult Patient

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CASE

A 58-year-old male with a history of prediabetes and hypertension presented to the emergency department by ambulance for left elbow pain after falling off a 10-foot ladder. He slipped and fell backward off the ladder while working, landing on his left side. He did not report any loss of consciousness. In addition to severe left elbow pain, he reported pain in his lower back and right shoulder. A review of systems was otherwise negative.

On arrival, the patient had a heart rate of 97, respirations of 16, blood pressure of 150/87, oral temperature of 36.7, and saturation of 97% on room air. His physical exam was significant for moderate distress secondary to pain, an obvious deformity to his left elbow with exquisite tenderness to palpation, limited range of motion at the affected joint, intact distal neurovascular function, mild tenderness to palpation at the right shoulder and humerus,

and moderate tenderness to palpation of the left lumbar paraspinal region. X-rays of his left elbow demonstrated a posterior dislocation. Additional X-rays of his right shoulder, humerus, and forearm were unremarkable. CT scans of his head and entire spine were unremarkable. Bloodwork also was unremarkable.

A total of 1 mg/kg of ketamine was given for procedural sedation for reduction of his elbow. The rate of infusion was not recorded. Initial reduction was successful; however, the laxity of the joint led to near-immediate repeat dislocation. While attempting to hold the reduction, the patient began having high-pitched sonorous respirations concerning for laryngospasm. The physician at head-of-bed immediately applied pressure to Larson's notch; however, the patient began to desaturate. Bag-valve-mask ventilations were initiated. Saturations normalized briefly before

dropping again, despite bagging and manual airway-opening maneuvers. The decision was made to perform rapid sequence intubation. A paralytic was unable to be obtained in a timely manner, and attempts to ventilate with application of pressure at Larson's notch and head tilt/jaw-thrust techniques were unsuccessful; thus the patient's neck was prepped for cricothyrotomy. Before an incision could be made, the patient's respirations improved, and he was successfully bagged up to a normal saturation.

OVERVIEW

Laryngospasm is a rare complication of ketamine, found in one systematic review to be 4.2 per 1000.¹ Cases necessitating advanced airway management are even rarer. In that same review, out of 883 ketamine sedations, the lone case of laryngospasm was resolved with conservative measures. The vast majority of incidents

are brief and responsive to manual airway maneuvers and bagging.

PHYSIOLOGY

The physiology of laryngospasm is thought to be an exaggerated glottic closure reflex in which the superior laryngeal nerve activates adductor and constrictor muscles of the vocal cords, creating sphincteric closing of the glottis. This reflex allows us to swallow without aspiration. Expiratory phase, decreased PaCO₂, increased PaO₂, and negative intrathoracic pressure facilitate glottic closure.²

EPIDEMIOLOGY

Laryngospasm occurs more frequently and with greater severity in pediatric patients. In one meta-analysis, adults have an incidence of 4.2 per 1000. Children up to the age of 9 years have an incidence of 17 in 1000 cases. Children between 3 and 6 months have an incidence three times greater, thought to be secondary to increased parasympathetic tone and narrower airways.³ Obese patients, particularly with a history of sleep apnea, also are at an increased risk.³

Less relevant to emergency medicine is the association with airway instrumentation. It's thought that laryngospasm in ketamine administration is due to salivation leading to ventilatory obstruction. Additional associations have been found with Down syndrome, Parkinson's disease, hypocalcemia, hypomagnesemia, nasogastric tubes, and secondhand smoke exposure.^{4,5}

There is no clear association with dose. There is insufficient evidence regarding any association with the rate of ketamine administration; however, it is recommended to administer over 1-2 minutes to reduce the risk of respiratory depression.

IDENTIFICATION

Laryngospasm is not always easily identifiable. In its textbook form, it presents as a high-pitched inspiratory stridor — or “crowing” noise — which may proceed to silent, complete airway obstruction. Other less obvious signs

include vomiting, increased work of breathing, or desaturation.⁶ Complete airway obstruction is defined by an absence of chest wall movement and lung sounds, abrupt loss of end-tidal waveform, and inability to ventilate.

MANAGEMENT AND LITERATURE REVIEW

Untreated laryngospasm is complicated by hypoxia which, if not addressed, can progress to cardiac arrest. Another complication is acute vacuum-associated pulmonary edema caused by negative intrapleural hydrostatic pressure.

The recommended approach to ketamine-induced laryngospasm is to begin with application of pressure at Larson's notch.⁷ Supplemental oxygen should be provided as needed. Sedation may be deepened, particularly with the use of propofol.⁵ If the patient is not responsive to these basic maneuvers, then bag-valve-mask ventilations must be initiated.

If the above measures fail and the patient cannot be ventilated, administration of propofol (1 to 2 mg/kg) resolves 80% of cases.⁵ If propofol is not readily available or ineffective, paralytics are indicated. Intravenous succinylcholine at a dose of 0.1 mg/kg is effective at stopping laryngospasm. Its rapid onset and shorter duration of action make it preferable to rocuronium in this situation, unless otherwise contraindicated. A larger dose (0.3 to 0.5 mg/kg) may be given for anticipated RSI, though bagging the patient without an advanced airway until the paralytic wears off is also an option. IV nitroglycerin (4 mcg/kg) also has been found to reverse laryngospasm.⁸

One study showed decreased incidence of laryngospasm in pediatric patients who were pre-treated with 0.5 mg/kg IV propofol, with an incidence of 20% in placebo vs. 6.6% in the treatment arm.⁹ It is reasonable to consider ketofol (combination of ketamine and propofol) for this reason. In fact, there is evidence that ketofol has a lower rate of adverse events than ketamine or propofol alone.¹

Magnesium has been trialed, with some success, as a pre-treatment to

relax laryngeal muscle in patients undergoing upper airway surgery.¹⁰ Studies have been performed to assess the role of anticholinergics such as glycopyrrolate in reducing the risk of laryngospasm, so far demonstrating no difference in outcomes.¹¹ Lidocaine (1 to 2 mg/kg IV or aerosolized) is effective in both preventing and treating laryngospasm, reducing its incidence by 19% to 30%.^{12,13,14} Coadministration of ketamine with benzodiazepines has demonstrated reduced incidence of laryngospasm with a number needed to treat of 26.⁶

Overall, laryngospasm is rare. When it does occur, it almost always resolves with simple interventions such as application of pressure to Larson's notch and assisted positive pressure ventilation. Paralytics may be necessary in rare circumstances. There are potential prophylactic measures for those at increased risk such as children, obese patients, and patients undergoing instrumentation of their upper airway. These measures include coadministration of propofol or benzodiazepines with ketamine and pretreatment with lidocaine or magnesium.

CASE CONCLUSION

Approximately 45 minutes after the laryngospasm resolved, the patient was awake without respiratory distress or oxygen requirement. He was oriented except for amnesia regarding the event. Orthopedics was consulted due to repeated failed attempts at maintaining reduction of the elbow in the emergency department. A CT of his left upper extremity showed bone fragments within the joint. The patient was placed in a posterior slab splint, admitted to trauma, and taken to the operating room by orthopedics the following day for definitive management of his posterior elbow dislocation and fracture. He was discharged from the hospital without any neurological deficits. ★

A Heartfelt Note of Thanks

EMRA 2022-23 Committee Leaders

We'd like to say **THANK YOU** to our outgoing committee chairs, chairs-elect, vice chairs, and assistant vice chairs for a 2022-23 term well served. EMRA is honored and humbled by your leadership. We wish you the best in all your future endeavors!

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March 21-24, 2023 CORD Academic Assembly in Las Vegas, NV



A Heartfelt Note of Thanks

EMRA 2022-23 Medical Student Council

We'd like to say **THANK YOU** to our outgoing Medical Student Council for a 2022-23 term well served. EMRA is honored and humbled by your leadership. We wish you the best in all your future endeavors!

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EMRA's Medical Student Council is the voice of medical students pursuing emergency medicine — in other words, the voice of the future of the specialty. Applications for MSC leadership positions are due Nov. 1 of each year. Each spring, we welcome new MSC leaders, who serve a one-year term beginning March 1 and ending March 31 the following year.

EMRA would like to extend a big, heartfelt welcome and congratulations to our incoming MSC leaders for 2023-24!



[more info](#)



A Call for Nominations...

EMRA Summer Awards

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

Augustine D'Orta Humanism Award

Clinical Excellence Award

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

EMRA/ACEP Medical Student Elective in Health Policy

FOAM(er) of the Year

Stephen Tantama, MD, Military Excellence Award

EMRA/ACEP EDDA (Emergency Department Director's Academy) Travel Scholarship

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

EMRA Simulation Research Grant

Faculty Teaching Excellence Award

Faculty Mentor of the Year Award

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

Clinical Pathologic Case Competition (CPC)

EMRA/EMF Resident and Medical Student Research Grant

ENTRIES CLOSED

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

emra.org/awards



#EMRASummerAwards

The Betty Bubble: A Week at the Hazelden Betty Ford Addiction Treatment Center

Brittany Ladson, DO

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Central Michigan University

ADDICTION IS A DISEASE THAT RESPONDS TO TREATMENT.

We must offer services to all patients no matter how many times it takes them to accept help. Who's to say that attempt number 30 isn't the one that will finally work? In the ED, we see only a snapshot of one's addiction, but it is important to remember that each patient has an entire story, and we can help change the ending.

I spent a week at the Hazelden Betty Ford Addiction Treatment Center in Rancho Mirage, CA. No, not as a patient, but as a participant in the Summer Institute for Medical Students (SIMS) program. Here's what I learned.

Hazelden Betty Ford is the nation's largest nonprofit addiction treatment center. The center addresses substance misuse utilizing the bio-psycho-social model of care and 12-step programs. Patients are provided mental health resources including cognitive behavioral therapy, dialectical behavioral therapy, anger management, group therapy, and more. They are encouraged to participate in meditation and yoga. They also work with dietitians and personal trainers to improve overall health and wellness.

Hazelden Betty Ford offers in-patient and intensive outpatient treatment as well as family and children's programs for the loved ones of those with substance use disorder. Their motto is "If not us, then who?"

My week-long experience was funded by the Betty Ford Foundation. The foundation's goal is to raise awareness, stimulate interest, and sensitize professionals to the process of recovery for substance use disorder patients and their family members. The SIMS program is unique because, instead of participation in a classroom setting, students learn by integration into the

daily lives of the patients. It has long been said the best way to help those not addicted understand the recovery process is to let them see it happen. This program did just that.

My SIMS cohort included 15 allopathic and osteopathic medical students from 15 different universities. We were all in Palm Desert to learn more about the disease of addiction. Many of the students had personal or family histories of substance use disorder, while others' exposures were from drunken drivers taking the lives of loved ones. My exposure was through research I have been conducting to understand vaping and opiate use disorder in high school students, and an additional project studying EM residents' naloxone rescue kit prescription habits to patients who have previously experienced overdose. I had imagined my SIMS participation would help me learn what more I can do for my future patients, but as the week progressed, I saw myself aligning more with the patients themselves.

At the beginning of the week, it was clear that the medical students were seen as outsiders looking in during patients' small group therapy. Many of the patients expressed they felt like "lab rats" while we listened to their stories without actually experiencing addiction ourselves. As the week progressed, patients and students began fraternizing

at meal times and in the hallway between sessions. It was astonishing how fast the patients went from feeling like strangers to people we knew for a lifetime. It was like learning about a patient by looking through a keyhole — having a short period of time to understand all the things they think about and have experienced. By the end of the week, I didn't feel like I was leaving a small group of four patients in recovery; I felt like I was parting from a creative artist, an intelligent future RN, a strong businesswoman, and a caring mother. It truly showed me that addiction is ubiquitous. It is just like gravity; it is all around us. Addiction is an equal-opportunity disease.

Our experience in group therapy was becoming a shared experience. I was learning to treat the patient, not just the disease. Patients in rehab are so generous; they really taught us so much and answered so many of our questions better than any textbook could. Doctors spend a lot of time with patients during their lifetime, but very rarely in this capacity. The experience was transformative for the patients as well. Many times patients expressed that they have felt that doctors have not done anything for them in the past. Some patients also expressed hatred of rehab centers because they see it as doctors making money off of their addiction and



then sending them back into the world to relapse and present back to rehab. Having future physicians in the room pledging to be a force of change for the future of addiction medicine helped change their perspectives. These patients will see doctors differently, and we will see patients differently, because of this experience.

The most commonly stated wish expressed by the patients during the week was to take care of ourselves. They all understand how hard it is to complete medical school and work as a physician for the rest of our lives. It is too easy to chase prestige and work yourself to exhaustion. Many patients expressed similar reasons for ending up with a substance use disorder, and they didn't want that to happen to the next generation of working professionals. The patient whose words most resonated with me on this subject was an emergency physician in treatment for opiate use disorder. He knew better than anyone

what the challenging world of medicine can do to a person. He reminded me that my life comes before my career no matter what. All it takes is one left step or one right step for you to become a patient at Hazelden Betty Ford.

As many patients describe during their experience at Hazelden Betty Ford, you can feel like you are in a bubble, shielded from the temptations of the outside world. Patients lovingly refer to this as the "Betty Bubble." Patients express concern with being able to apply what they learn at the center to their real-life situations.

I, too, was in the "Betty Bubble" during the week. I learned so much, but what if I cannot apply it to my real-life situations in my residency program, my hospital system, and beyond? Then was going to rehab really worth it?

As a newly matched emergency medicine resident, the themes present throughout the week resonated with me. The emergency department is the

place where you will see patients with substance use disorder in their most chaotic state. These patients may be labeled "frequent flyers." A patient raised an excellent point that emergency doctors and nurses become curious when a patient with a substance use disorder stops presenting to the ED. It's rare they assume the patient is in recovery; instead, they assume the patient overdosed and died. However, that patient's spot in the emergency department will surely be replaced by another member of the community experiencing addiction, and the cycle of judgment by health care staff continues.

Instead of applying derogatory terms to patients and making light of their addiction, we can be a force of good in their life. As a future emergency physician, I have the power to connect patients to local resources, provide naloxone rescue kits, and educate family members accompanying the patient about addiction. Hospitalizations are a

time when patients most likely evaluate their lives and health, and if we can offer some wisdom during this time, we could help change outcomes. Addiction medicine is truly preventative medicine. It prevents cirrhotic and steatohepatic disease, bloodborne illnesses, necrotizing fasciitis, and so much more. We must not underestimate the impact we can make in these critical moments.

Moreover, I reflected on the volume of patients seen in the emergency department who experience addiction (whether it is their chief complaint or a long-term repercussion). A profound number of patients experience substance use disorder. In many communities, they make up the majority of ED patients. However, we spend a disproportionate amount of time, education, and health care dollars on learning about and treating other conditions. There are many ways the health care system can better serve patients. One way we can do this is by ensuring that an addiction medicine consult service is available in every hospital. We must also understand

the intersectionality of other addictions, most prominently food and nicotine addiction.

Addiction is a disease that responds to treatment. We must offer services to all patients no matter how many times it takes them to accept help. Who's to say that attempt number 30 isn't the one that will finally work? In the ED, we see only a snapshot of one's addiction, but it is important to remember that each patient has an entire story, and we can help change the ending.

In addition to what can be accomplished in the hospital, there is so much we can do at the medical school level to improve outcomes for patients with substance use disorder. I would like to see medical schools require students to attend Alcoholics Anonymous or Narcotics Anonymous meetings. It's one thing to connect a patient with their local AA group, but it is another to share with them what they can expect to experience. And, most importantly, attending an AA or NA meeting shows solidarity in the fight against addiction.

I also solidly believe in the power of the experiential learning model. The SIMS program provides the opportunity to learn what rehab centers really look like, what programming is offered, and how it is implemented. Rehab is more than yoga, meditation, and therapy. There are didactic sessions, community fellowship, and so much homework in completing the 12 steps. Rehab is truly two experts coming to the table and treating a disease. The patient is an expert on themselves, and the therapist is an expert in counseling. If a patient is apprehensive about attending rehab, being able to share your personal experiences might have profound persuasion.

We also received camel pins just like patients do on their first day in rehab. In AA, camel pins represent how a camel picks up its load at the beginning of the day, holds its head high, stays dry the entire day, and then goes to its knees at the end of the 24-hour period. The same concept applies to sobriety in that you can avoid alcohol and other substances





Dr. Brittany Ladson along with other participants in the Summer Institute for Medical Students program at the Hazelden Betty Ford Addiction Treatment Center.

for a 24-hour period. You too can stay dry for a 24-hour period. Sobriety happens one day at a time. Just like many health care professionals wear pins to show their solidarity with Black Lives Matter and the LGBTQ+ community, wearing a camel pin can show solidarity with those experiencing addiction. For patients who do not recognize the significance of the camel, it will be a great conversation starter and will help spread the message that recovery is possible. I plan to wear my camel pin through residency and beyond to show support for those struggling in the community I am serving.

At the end of the week, while leaving the center, I couldn't help but notice the profound physical and architectural barriers that keep the rehab center away from public eyes. The 12-foot-tall shrubs, security officers, and gates at the front all create privacy in a way that is more profound than any other type of medical facility. The Eisenhower Health Center shares the same parking lot as Hazelden Betty Ford, but they do not have more than palm trees in their parking lot. Of course HIPAA applies in all medical settings, but there is a deeper reason for Hazelden Betty Ford's privacy. There is

a very different perception for patients walking into an addiction treatment center vs. a cardiology office. The implications on a patient's career and society's perception of that individual can be overwhelming. However, you truly never know who is experiencing addiction, and stereotypes will never apply accurately. I understood this best when I learned that nearly all the counselors and medical staff who work at Hazelden Betty Ford are in long-term recovery themselves.

After our final day in the program, the other medical students and I decided to explore the city of Palm Springs and enjoy fellowship among each other. Even this celebratory part of the week had deep implications for me. If you practice addiction medicine, should you feel guilty for having an alcoholic beverage when you are off the clock? When I asked this question to one of the addiction medicine fellows, he replied, "The same concept applies if you work with diabetics and have dessert after work. Or if you work with heart attack patients and then have a salty dinner." For someone in recovery, one drink is too much and 100 drinks is never enough. I believe doctors have an obligation to their patients to lead by

example, but we must also remember to appreciate that we do not have the disease of addiction.

During this week, my worldview changed, and now it is my job to take what I learned and change the world. The SIMS program builds an army. We will be a ripple in the water of addiction medicine. We will help keep patients alive long enough to get the relief they seek. We will love patients until they can love themselves. SIMS helped complete my education. We have so much textbook education, but now we have the stories of the patients behind it. We learned to listen, not to respond, but to truly hear our patients. We stopped thinking with our heads and started thinking with our hearts. The opposite of addiction is not recovery, it is connection.

On a patient's one-year anniversary of recovery in AA, all meeting attendees sing Happy Birthday to their sobriety. One year from now, I will be celebrating the anniversary of my attendance in the SIMS program, and just like in AA, I will be celebrating by singing Happy Birthday. I hope to be reflecting on the good I was able to do, the patients I was able to help, and the great things I have planned to help fight addiction. ★

Bilateral Pneumoparotid: Unexpected Air in the Parotid Glands

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Pneumoparotid/pneumoparotitis is an uncommon cause of parotid gland swelling classified by free air seen within the parotid glands. Typically, swelling of the parotid glands can be attributed to infection, autoimmune disease, obstruction, or benign growths. Overall, pneumoparotid is a condition that is generally self-induced and self-limited. Physical exam and imaging are pertinent to accurate diagnosis, and ENT consultation is recommended to ensure complete resolution.

CASE

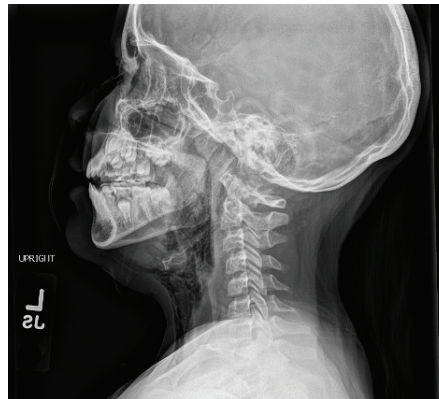
A 10-year-old otherwise healthy female presented to the ED with bilateral posterior mandibular facial swelling that had begun earlier that day without trauma. The onset of her symptoms occurred while she was playing video games approximately 2 hours prior to arrival. She did not report any symptoms other than mild bilateral facial pain and a feeling of fullness in her cheeks. Her parents noted that the swelling occurred without any identifiable precipitating factor.

Initial physical examination demonstrated mild swelling around the mandibular angles with no erythema or induration present. Intraoral examination revealed no signs of dental trauma, mucosal swelling, drainage, or posterior erythema. Crepitus was felt throughout the patient's anterior neck extending to the mastoids, indicating subcutaneous air.

Soft tissue radiographs demonstrated subcutaneous air extending from the anterior neck and lower face bilaterally. Otolaryngology was consulted, and a diagnosis of pneumoparotid was made. The patient was discharged with ENT follow-up and antibiotics.

DISCUSSION

Pneumoparotid/pneumoparotitis is an uncommon cause of parotid gland swelling classified by free air seen within



the parotid glands. Typically, swelling of the parotid glands can be attributed to infection, autoimmune disease, obstruction, or benign growths.

In this case, the cause of retrograde flow of air into the parotid gland was likely an insufficient Stensen's Duct. This is the duct that typically allows for anterograde flow of serous saliva

from the parotid gland into the oral cavity.² There is no identified cause of an insufficient duct, although average measurements of Stensen's Ducts are 5 cm long and 1.7 mm in diameter.¹ Shorter, wider ducts would be at a higher risk of insufficiency, allowing retrograde flow into the gland itself.

Since 1987, only 54 cases of pneumoparotid have been reported in literature. The majority of these cases (74%) are in the pediatric population and are linked to psychological stresses or tic disorders. All cases can be linked to an increase in intraoral pressure, whether self-induced or iatrogenic/idiopathic.² It was reported that childhood stresses could range from conflicts with parents to an excuse to not attend school. It was also reported iatrogenically in patients receiving CPAP.² Although seen as bilateral in this case, unilateral cases have been reported.

Stensen's Duct is formed sometime during the 6th-12th week of development to transport the parotid secretions.⁸ The parotid glands consist of clusters of acinar cells, which create the serous saliva; interspersed are fatty adipocytes and duct cells.³ When air enters the parotid gland, it insufflates completely to the level of the acinar cells. Acinar cells are low-pressure systems connected by tight junctions with minimal myoepithelial cell support.³ A consequence of insufflating these cells



is rupturing these acinar complexes, causing air to track along the cervical fascial planes.

Crepitus felt on exam should lead clinicians to obtain further imaging. As the name implies, simple pneumoparotid will show air within the parotid glands, while pneumoparotitis will have observable inflammatory changes and pain.² These changes can be as subtle as mild erythema at the opening of Stensen's Duct, or as obvious as purulent discharge with mandibular erythema.⁴

Radiographic evidence can be obtained through multiple modalities, depending on the institution's capabilities. In this case, plain film X-ray was utilized given the patient's age and parent knowledge and comfort, showing subcutaneous emphysema tracking along the patient's anterior neck and to the angles of both mandibles.

Computed tomography (CT) is the gold standard and gives excellent visualization of the extent of intraglandular air as well as extraglandular air in subcutaneous tissue.⁵ CT with thinner slices is preferable to identify any complicating pathology such as stones or abscesses. Ultrasound may be utilized and can help demonstrate air within the gland.⁶ This can be seen as a ring-down effect while using a linear probe.

Management of pneumoparotitis/pneumoparotid is focused on infection prophylaxis and ensuring resolution of subcutaneous air. Otolaryngology (ENT) consultation and follow-up is recommended to ensure resolution. Infection of simple pneumoparotid is a feared complication that can lead to abscess formation or spread of infection through fascial planes. Penicillin

is recommended as a prophylactic antibiotic treatment.

CASE CONCLUSION

The patient was discharged with ENT follow-up and antibiotics. During two subsequent follow-up appointments, resolution of subcutaneous air occurred, no infection was reported, and a possible cause was brought to light. The patient reported blowing up a pool toy with minimal pain the day before and blowing into a closed fist just prior to her symptoms beginning.

Overall, pneumoparotid is a condition that is generally self-induced and self-limited. Physical exam and imaging is pertinent to accurate diagnosis, and ENT consultation is recommended to ensure complete resolution. ★

Words Matter: The Importance of Communication in Medicine

Robert Allen, MD

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The next time you or I see a patient, let's take a second to confirm the patient can adequately understand us. That may mean speaking slower, speaking louder, or making sure the patient has hearing aids in place beforehand. It may also mean taking the time to sit down to be at eye level, using a clear mask, using a certified translator, or allowing a family member to be at the bedside.

Communication is a pillar of medicine. While we remember (or don't) the hundreds of hours in the library with our noses stuck in immunology and anatomy books, arguably the most important skill we learn in medical school is how to interact with patients. A physician may have a photographic memory and the best examination scores, but without the ability to communicate effectively, this physician will struggle.

In the spring of 2020, when the COVID pandemic came to the United States, it forever changed medicine and

life as we know it. The toll it has taken on human life, mental health, and everyday activity has been unimaginable. Yet the impact it has had on our ability as physicians to effectively communicate¹ with patients has been less well documented.

I realized the scope of this issue a few months ago when my wife and I went to the hospital for the delivery of our first child. My wife was born with profound hearing loss, but she has adapted with the use of hearing aids and lip-reading to allow her to communicate and become a successful physician. An unintended

consequence of the COVID pandemic and the widespread use of masks has been a hindrance to her ability to communicate effectively. While creating an effective barrier to pathogen spread, tightfitting N95 masks also tend to muffle speech. Furthermore, opaque masks have effectively eliminated her ability to lip-read. The combination of muffled speech and an inability to lip-read has made it very difficult for her to understand patients and providers alike.

Fortunately, clear masks have been designed and approved² for hospital use. These clear masks allow my wife to lip-read and significantly improve her ability to understand speech. In anticipation of our delivery, we emailed both the OB/GYN and pediatric departments well ahead of time to ensure that they would have clear masks available to facilitate communication with my wife during and after the delivery.

Upon our arrival at the hospital, we were greeted by the labor and delivery nurse and an iPad on a stand. My wife and I looked at each other and quickly corrected the nurse that we did not need an American Sign Language interpreter.

Common misconception: Not all Deaf people sign. Just as you might ask a patient what their preferred language is, consider asking Deaf people for their preferred method of communication.

Just after the nurse returned the iPad, the anesthesiology resident brought the same iPad right back into the room. After we went through the





explanation one more time, the nurse and anesthesiology resident apologized for their misunderstanding and were eventually able to find clear masks.

Despite our emails and frequent in-person reminders, nurses and physicians wore clear masks <50% of the time that they interacted with my wife. Fortunately, I was in the room and able to repeat things to her with my mask pulled down.

But what if I hadn't been in the room? Even as a well-educated physician, isn't it important for my wife to hear the nurses and physicians correctly? What good are the best discharge instructions if your patient cannot understand what you are saying? Even worse, what if a nurse had administered a medication my wife was allergic to because my wife couldn't understand the nurse?

At our 48-hour pediatrician appointment (in a different health care system), did our pediatrician wear a clear mask? Despite our multiple emails

to the office weeks in advance and their repeated assurances that clear masks would be available, they were not. What if I hadn't been there to repeat questions and statements to my wife? What if I wasn't a health-literate physician and had accidentally misinterpreted things to my wife? Shouldn't a first-time mother have the right to communicate effectively with her pediatrician?

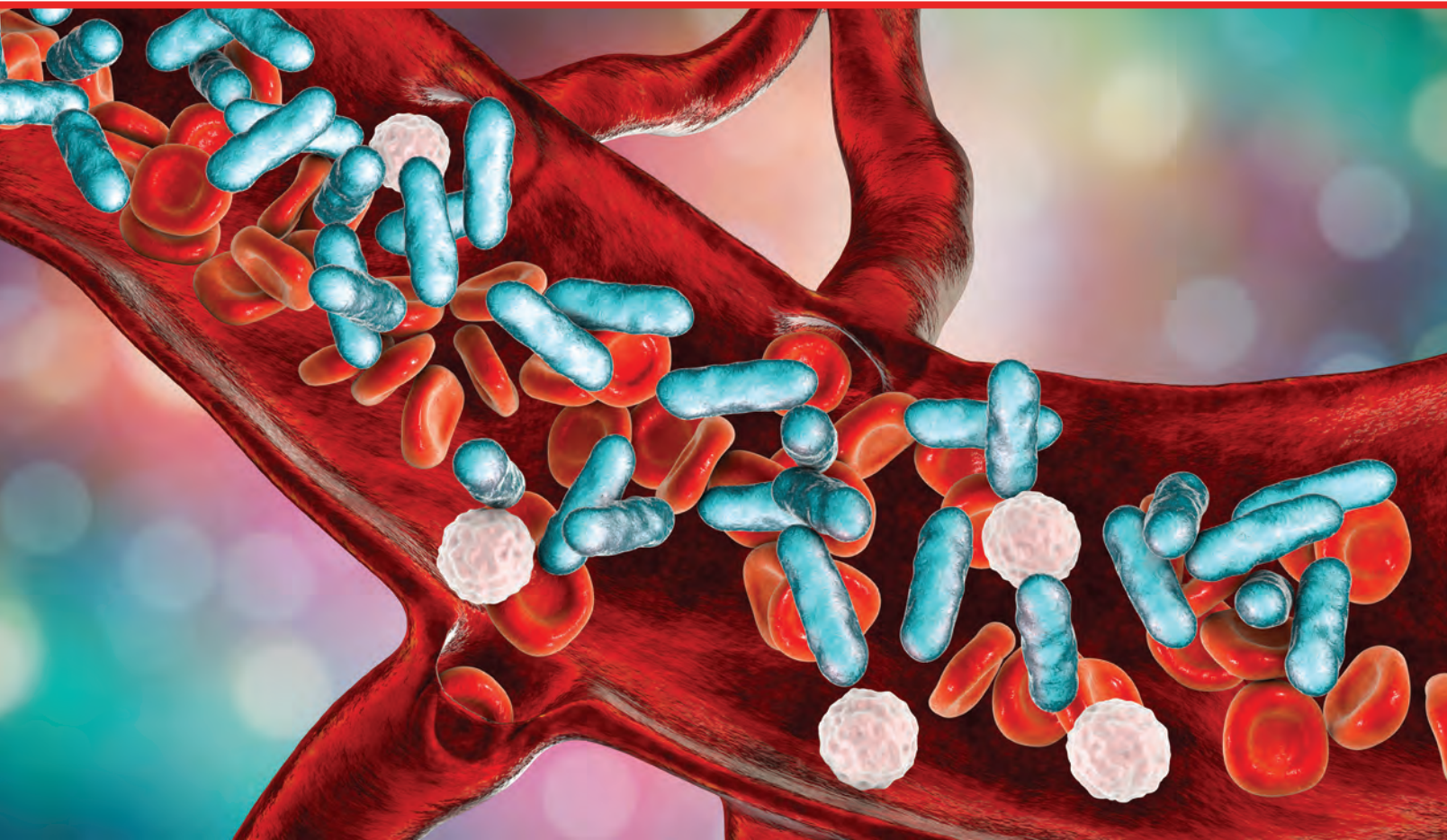
Overall, I don't believe the blame falls solely on the nurses, the anesthesiology resident, or our pediatrician. Some blame assuredly resides with the health care system for failing to provide and ensure compliance with the use of clear masks. Moreover, one can also blame it on the pandemic.

Failure to communicate effectively is not isolated to the Deaf or even to the COVID pandemic. Multiple studies have demonstrated that non-English speaking patients may have worse outcomes than their English-speaking counterparts.^{3,4} Is this in part due to occasionally foregoing

the use of a translator service? Probably. I'm guilty of not always using a certified translator 100% of the time.

Will my recent frustrations with communication during our delivery lead me to be more conscientious of patients with different communication needs? I hope so. With any problem, the first step is recognition. Hopefully, the next time you or I see a patient, we will take a second to confirm the patient can adequately understand us. That may mean speaking slower, speaking louder, or making sure the patient has hearing aids in place beforehand. It may also mean taking the time to sit down to be at eye level, using a clear mask, using a certified translator, or allowing a family member to be at the bedside.

The COVID pandemic has been an obstacle to many things, but let's make sure it doesn't take away from our greatest skill: the ability to communicate effectively. ★



Pelvic Sepsis: A Fatal Complication of Routine Hemorrhoidectomy

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CASE INTRODUCTION

A 39-year-old male presented to the emergency department with urinary retention and scrotal swelling. He had undergone an external hemorrhoidectomy 3 days prior to presenting, but had an otherwise unremarkable medical history. He had been evaluated by an outpatient urologist, who placed a Foley catheter and referred the patient for a CT scan. The CT scan showed fluid-tracking involving the paracolic gutters, pelvic fat stranding, diffuse mucosal thickening of distal rectum and anus, diffuse subcutaneous edema of gluteal regions,

and soft tissue swelling involving the scrotum; there was no evidence of subcutaneous emphysema (Figures 1 and 2). Upon receiving the CT results, the urologist immediately referred the patient to the ED. Differential diagnoses considered included gas gangrene, necrotizing fasciitis, and pelvic infection.

Upon initial evaluation in the ED, the patient was alert and oriented and complained only of nausea. Initial vital signs were within normal limits. The patient reported no pain in the genital area. He was taking ibuprofen, acetaminophen, and oxycodone routinely after surgery. On exam, the perineal

area was pink and well-perfused with induration but no crepitus. The scrotum was significantly edematous with phimosis. Intravenous fluids, labs, and broad spectrum antibiotics were ordered. Point-of-care lab results were pH 7.19 and lactate of 9.1. At this time, general surgery and urology were consulted.

Fewer than 60 minutes after presentation, the patient began to decompensate. His skin was pale; he appeared in distress and was hypotensive and tachycardic. The colorectal surgeons noted perianal and perineal discoloration with mild boggy around the hemorrhoid incision, concerning

for necrotizing fasciitis. Additional antibiotics and IV fluids were given, and he was scheduled for emergency debridement in the OR. Repeat labs at that time were worse, with lactate >10 and WBC 77. Despite resuscitation, he became tachypneic and hypoxic, requiring emergency intubation. He suffered a seizure and ultimately went into cardiac arrest and died.

CASE CONCLUSION

Upon case review with physicians from emergency medicine, colorectal surgery, urology, and critical care, a general consensus was that the patient suffered from pelvic sepsis leading to severe shock with multiorgan failure. Despite aggressive and appropriate sepsis resuscitation, the patient did not make it to the OR for debridement.

The case was accepted by medical examiners for further evaluation. After one month, cause of death was not officially determined, but suspected to be related to surgical site infection. The medical examiner reported negative blood cultures. The pelvic area demonstrated gross and microscopic evidence of infection. There were multiple organisms in the pelvic sample but not yet determined contaminant versus culprit. There was no bacterial growth in the initial blood cultures from presentation after 5 days.

During discussion, it was discovered that the colorectal surgeon had placed local anesthetic in the rectum to help with post-operational pain. It is possible that the combination of analgesic and antipyretic medications masked the patient's initial sepsis symptoms, resulting in a delay of his presentation to the ED.

DISCUSSION

Hemorrhoids are a common cause of anal discomfort and rectal bleeding, with a prevalence of 4% in the population.¹ Hemorrhoids are classified as internal or external, based on their location above or below the dentate line, respectively. While external hemorrhoids are often medically managed or excised with an in-office procedure, various surgical treatment options exist for internal

hemorrhoids.

The most common complication for excision of thrombosed external hemorrhoids include recurrence. Bleeding and swelling are also common. Excision of internal hemorrhoids can come with more severe complications including bleeding, urinary retention, fecal incontinence, sepsis, and rectal perforation.² Interestingly, prophylactic antibiotics are not routinely prescribed after hemorrhoidectomy, as the risk of infection is assumed to be low and antibiotics do not reduce risk of infection.³

Urologic difficulties and pain are common in post-surgical patients. Many patients experience urinary retention due to pelvic pain.⁴ A temporary Foley may be placed to prevent bladder distension and improve patient comfort. However, persistent urinary retention, dysuria, and unexpectedly severe pain in the genital area should indicate the possibility of more severe post-surgical problems. Lack of urine with Foley placement may indicate renal dysfunction. Patients with recurrent or severe complaints should be examined by the urology and colorectal surgery services for further management while in the ED.

Severe perineal or abdominal pain, urinary retention, fever, and leukocytosis could be features of perineal sepsis. Examination of the surgical area can appear normal. Patients may have vague complaints such as pain and constipation. In previous reports, some patients visited the ED more than once with these symptoms before pelvic sepsis was diagnosed.¹ Those presenting early with tissue edema and sepsis, but without established tissue necrosis, can

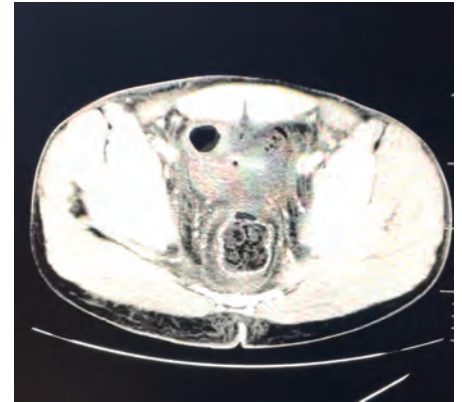


FIGURE 1: CT Pelvis Axial demonstrating proctitis, free fluid in pelvis



FIGURE 2: CT Pelvis coronal slice demonstrating proctitis, free fluid in pelvis

be treated conservatively with antibiotics. It is important to note that the absence of gas on CT does not exclude the possibility of gangrene or necrotizing fasciitis. However, those with established necrosis and/or subcutaneous emphysema should undergo urgent debridement of nonviable tissue. Even with surgical debridement, mortality is high.¹

IMPORTANCE OF AWARENESS

Pelvic sepsis is a well-known and feared complication of colorectal and urologic surgery; however, it is not common and may not be recognized by emergency physicians. Patients may present with only mild chief complaints and relatively normal physical exams. Thus it is important to involve surgeons early in these cases and obtain CT imaging. Empiric antibiotics should include those that cover anaerobic organisms; examples of such antibiotics include clindamycin and metronidazole.

This case exemplifies the severity of pelvic sepsis and how it can affect anyone, regardless of age or comorbidities. ★



Tips for Palliative Medicine Consults in the ED

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CLINICAL VIGNETTE

A frail 95-year-old woman with multiple medical comorbidities presents to the emergency department with somnolence and confusion. She lives in a nursing home, and staff noticed she was sleepier than usual and not communicating as she normally does. She was also displaying labored breathing.

On arrival, EMS noted minimal responsiveness, a heart rate of 32 beats per minute, and blood pressure of 83/50

mmHg, both of which improved with the initiation of transcutaneous pacing. EMS also recorded an SpO₂ of 80% which improved to 92% after initiating 6L oxygen via nasal cannula.

The patient has a past medical history of CHF, atrial flutter, interstitial lung disease, CKD stage IV, vascular dementia with prior stroke, residual left-sided weakness, and dysarthria. She does not ambulate at baseline, and code status at her nursing home is documented as

DNR/DNI.

Upon arrival at the ED, an ECG is obtained while pacing is paused. It shows a junctional bradycardia with a heart rate of 30. She becomes hypotensive and somnolent while pacing is paused. External pacing is resumed, and mechanical capture is achieved with improvement in her mental status and blood pressure. Her new onset junctional bradycardia is discussed with cardiology and the patient's health care agent/

Although most evaluations and interventions focus on providing life-sustaining interventions in the ED, emergency physicians must also be prepared to provide proper care to individuals who may not benefit from the introduction of life-sustaining interventions. Emergency physicians must have knowledge of palliative care and must be able to perform palliative care when indicated. In specific situations, a palliative care consultation may be helpful in initiating and coordinating care for patients who would benefit.

proxy, her daughter. It is determined that ultimately permanent pacemaker placement would be the only definitive treatment, although there is some concern that she may not tolerate it well.

The patient's daughter further discusses the situation with additional family, the emergency medicine team, and the cardiology team. The patient's family decides to terminate transcutaneous pacing and transition the focus of her care to maintain comfort, understanding she is expected to pass away from her current medical condition. Her daughter requests she be transported back to her nursing home to expire because it is more peaceful there. The patient is provided supplemental oxygen for comfort, and cardiopulmonary monitoring is stopped. Intravenous access is currently maintained for medication delivery. After 15 minutes, the patient becomes tachypneic and

agitated, which is relieved with 1 mg IV lorazepam. After approximately 30 minutes, she begins to appear agitated and restless; her symptoms again improve with an additional dose of IV lorazepam.

WHAT IS PALLIATIVE MEDICINE?

Palliative medicine is a medical specialty that focuses on preventing and relieving suffering and emphasizing quality of life for patients who are experiencing a serious and/or life-threatening condition, as well as their families.¹ Physicians who complete fellowship training in Hospice and Palliative Medicine develop expertise in symptom management and effective communication skills.

WHAT IS PALLIATIVE CARE?

Palliative care is an interdisciplinary field that focuses on preventing and relieving suffering and emphasizing quality of

life for patients with a serious illness, such as a life-threatening or life-limiting condition, as well as their families.¹ The disciplines represented within this broad field include social work, spiritual care, nursing, pharmacy, and medicine. Palliative care is not limited to dying patients and may be offered in conjunction with life-prolonging treatment.

Palliative care teams may help support patients and families through symptom management, discussing goals of care, or initiating and establishing adequate resources for patients and their family members to assist in their disease process, as well as coordinating all these aspects among multiple disciplines of medicine, and more.

WHAT IS HOSPICE CARE?

It is important to distinguish between hospice care and palliative care. While

TIPS FOR CONSULTING PALLIATIVE MEDICINE

1. Know when it is appropriate to consult palliative medicine. The following is a general list of situations when consultation of palliative medicine may be appropriate:
 - Difficulty in managing pain or other symptoms
 - Symptom management for an actively dying patient
 - Rapid consensus for goals of care
 - Clarification of provisions in an advance directive
 - Withdrawal of non-beneficial treatments
 - Bereavement support
 - Challenging dispositions requiring care coordination²⁻⁴
2. Have a specific question. As with any consult, asking a direct question you would like assistance with is appreciated. "I would like assistance with pain and anxiety medications management for a patient." This example provides palliative medicine providers with a particular goal, allowing them to begin to formulate a plan.
3. Provide a thorough history to the palliative medicine provider. At this point in the patient's care, you know much more about the patient and their history than the consultant. Be sure to provide as much history as you can regarding the patient's presentation and what you have done so far in the emergency department.
4. Introduce the concept of palliative care with the patient/family before consulting palliative medicine. It is important that the patient and family members or any other individuals involved in the decision-making process understand what palliative medicine offers. Many individuals hear the term "palliative care" without a true understanding of what this field of medicine involves. It is important to inform them of what the scope of practice and goals of palliative medicine are so they have better insight into what will potentially be involved in care going forward.
5. Begin the palliative process in the emergency department. Emergency physicians can and should begin goals of care discussions and symptom management when appropriate. These are all things that can and should be done before consulting palliative medicine.

hospice provides palliative care, palliative care is not synonymous with hospice. Palliative care provides quality of life and symptom management in all patient populations, not just those with a terminal illness with a life expectancy of fewer than six months.

The goal of hospice care is to provide medical care for patients with terminal illnesses. It is also to provide support and care for their family members and other caregivers. It focuses on quality of life rather than attempting to cure disease or prolong life. It has a specific role when patients and/or their families/loved ones decide to cease potentially curative therapies to focus on quality of life. Patients who qualify are those with a life expectancy of fewer than six months.

PALLIATIVE CARE IN THE ED

Although most evaluations and interventions focus on providing life-sustaining interventions in the emergency department, emergency

physicians must also be prepared to provide proper care to individuals who may not benefit from the introduction of life-sustaining interventions. Therefore, emergency physicians must have knowledge of palliative care and must be able to perform palliative care when indicated. In specific situations, a palliative care consultation may be helpful in initiating and coordinating care for patients who would benefit. The emergency physician may find the following tips helpful when getting a palliative care team involved.

CASE RESOLUTION

You discuss with the family the idea of consulting palliative medicine. You explain to them the role they will play and their expertise in symptom management in end-of-life care. They agree with the consultation. You then consult palliative medicine for assistance with symptom management. You review the nature of the patient's presentation

and the goals of care discussions that were already made with the patient's family. The palliative medicine physician recommends admission to their service and discusses this with the daughter, who agrees to admission for end-of-life care.

TAKE-HOME POINTS

- When you consult palliative medicine:
 - Know when it is appropriate to consult their service.
 - Begin the discussion with the family and consider recommending palliative involvement.
 - Have a specific question.
 - Provide a thorough history to the palliative medicine provider.
 - Begin the process of palliative treatment in the ED if appropriate.
- Patients who have a terminal illness and life expectancy of fewer than six months are eligible for hospice.
- Although hospice includes palliative care, palliative care is not hospice. ★





Palliative Care in the ED: PAST, PRESENT, AND FUTURE

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ABSTRACT

The emergency department provides immediate access to medical care for patients and families in times of need. Increasingly, older patients with serious illness seek care in the ED, hoping for relief from symptoms and suffering associated with advanced disease.

Until recently, palliative care services have been largely unavailable in emergency departments. However, in the past decade, there has been growing recognition from both the EM and palliative medicine communities on the importance of palliative care provisions in the ED.

The past 10 years have seen a surge in EM–palliative care training and education, quality improvement projects, and research. As a result, the practice paradigm within EM for the seriously ill has begun to shift to incorporate more palliative care practices.

Despite this progress, substantial

work has yet to be done in terms of identifying ED patients in need of palliative care, training EM clinicians to provide high-quality primary palliative care, creating pathways for ED referral to palliative care and hospice, and researching the outcomes and impact of palliative care provisions on patients with serious illness in the ED.

CONSIDERATIONS

The aging of our population results in the growing number of patients living with serious illnesses. Unsurprisingly, these patients often present to the emergency department, especially toward the last stages of their illnesses. In fact, over half of older adults will visit the ED in the last month of life.

Most patients with serious illnesses report that they prefer medical therapies that minimize pain and suffering, and maximize their time at home. Importantly, most prefer to avoid

aggressive therapies that have low likelihood of promoting, sustaining, or improving quality of life, such as CPR and intubation.

However, the traditionally dominant paradigm in emergency medicine is to maintain life at all costs. Consequently, many older patients spend the last months of their lives coming in and out of the ED. Additionally, the aggressive high-cost, low-quality, end-of-life (EOL) care has a significant financial burden.

The changing realities of our patient population should prompt us to adapt our practices and focus on patients' goals and preferences when providing treatment. The integration of EM and palliative care is an essential part of making the necessary changes.

RECENT HISTORY

In 2003, ACEP released a statement directing emergency physicians to improve EOL care by developing



communication skills and clinical approaches targeted to the needs of patients with serious illness. At the time, there were limited palliative care education, training, and guidelines to support emergency physicians as they provided care to patients. The statement from ACEP gave rise to numerous projects aimed at improving palliative care in the ED.

Research efforts during this time revealed significant benefits to palliative care in the ED, including improved hospital outcomes, reduced hospital length of stay, improved patient satisfaction, and cost savings.

In 2006, hospice and palliative medicine (HPM) officially became a subspecialty in medicine, and EM was one of 10 specialties allowed to pursue HPM as a subspecialty. This increased interest among emergency physicians to become dual board-certified in EM and HPM. In 2012, ACEP released its “Choosing Wisely” recommendations, which further emphasized the importance of integrating palliative care into EM. These events from 2003-2012 accelerated changes in EM practices and encouraged more widespread adoption of palliative care in the ED.

TRAINING OPPORTUNITIES

With the number of people living with serious illness expanding, the ongoing shortage of clinicians with palliative care training continues to be concerning. Because the imperative to educate the EM workforce has only recently been established, most practicing emergency physicians have not been exposed to

adequate palliative care training.

Fortunately, more educational and training opportunities in palliative care have been developed specifically for emergency physicians. These include the Center to Advance Palliative Care’s (CAPC) Improving Palliative Care in Emergency Medicine (IPAL-EM) program and Northwestern University’s Education in Palliative and End-of-Life Care (EPEC-EM) program. Currently, five states require physicians to participate in palliative continuing medical education credits.

The presence of palliative care training for EM residents varies across the country. A study in 2012 showed that 88% of EM residents agreed that palliative care skills are an important area of competency, but roughly half of them reported having minimal training in palliative care. A common barrier was the lack of palliative expertise among teaching faculty. Most EM programs tailor their teaching to address the content of American Board of Emergency Medicine (ABEM) examinations, but only a handful of questions are related to palliative care.

Importantly, dual board-certified EM/HPM physicians have served critical leadership roles in spearheading training and quality improvement initiatives to respond to increased palliative care needs in the ED. Quality improvement initiatives have mostly focused on improving patient access to palliative care through improving skills in emergency physicians and identifying patients who could benefit from such care.

Researchers have determined that one of the most effective methods of palliative care screening in the ED is through tools such as Palliative Care and Rapid Emergency Screening (P-CaRES) and Screen for Palliative and End-of-life care needs in the ED (SPEED). Even quick and easy tools — for example, the “surprise question” worded as, “Would you be surprised if your patient died in the next one month?” — have proven useful in identifying patients near the end of life.

ONGOING RESEARCH

Palliative care implementations in the ED and their effects are a growing area of research studies. Advance care planning (ACP) is an important focus area within palliative care in the ED and presents a significant opportunity to engage with patients. Studies show that more than 70% of older adults prefer quality of life rather than life extension. Yet, 56%-99% of older adults do not have advance directives in place at the time of their ED visit and are at risk of receiving care inconsistent with their goals. Initiating ACP in the ED can be an opportunity to change the trajectory of patient care for older patients.

Common barriers for ACP initiation in the ED include time constraints, limited privacy, and uncertainty in patients’ awareness of their illnesses. A 6-minute motivational interview has been developed specifically for emergency physicians to help them engage their patients in thinking about goals of care. This intervention can motivate patients to hold more time-consuming, sensitive conversations during outpatient visits with their primary care physicians, with whom they typically have longer relationships.

The effects of these interventions are still being tested at this time, along with other studies examining potential benefits of incorporating palliative care in the ED. While many studies on this topic are ongoing, it’s evident that integrating palliative care training into the specialty of emergency medicine will have a significant impact on the quality of care given to our aging population. ★

Top Gun Toxicity: Military-Grade Hydrocarbon Exposure Management in the ED

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INTRODUCTION

November 2021 was a difficult month for members of the U.S. Armed Forces and Hawaiians on Oahu. The Red Hill bulk oil storage facility, in use since the 1940s, was found to have leaked a copious amount of aviation and maritime fuel into local aquifers, which serve as the exclusive supply of potable water to Hawaii.^{1,2} Although Red Hill had leaked previously in 2014, the November 2021 leak marked the first time that a fuel leakage led to unsafe drinking water. This leak was first noted by those in military residences who observed that the water emanating from the tap had the strong odor of petroleum.

Since the 2021 leak, Red Hill has been shut down per directive from Secretary of Defense Lloyd Austin

III.^{1,2} The ramifications of military fuel exposure extend beyond this environmental disaster to acute exposures/ingestions and chronic toxicity. With more than 450 military bases in the United States, many of which utilize the same fuel as Red Hill called JP-8, the emergency physician should be familiar with the presentation and management of military-grade hydrocarbon toxicity.

MILITARY FUEL 101: THE BASICS

JP-8, which stands for Jet Propellant 8, is a mixture of hundreds of hydrocarbons used as fuel in military aircraft engines and less commonly marine engines. Many of the same hydrocarbons are also present in gasoline and Jet-A, the civilian aircraft fuel. The largest difference between



A U.S. Navy MH-60S Seahawk helicopter performing training operations off the coast of Virginia. Photo courtesy of Dr. E. Mason Jackson.

military and civilian fuel is the presence of several additives including deicers and antioxidants. JP-8 is a distillate of





kerosene and is composed of aromatic (eg, benzene) branched and straight chain alkanes (eg, decane), and naphthalenes, among others. U.S. Navy and Coast Guard vessels utilize gas turbines and can use JP-8 for power if their usual diesel-based fuel, F76, is not available.^{3,4} For logistical purposes, most reservoirs of fuel are housed in bulk at various facilities to allow for controlled distribution, safeguarding, and ease of use.

CASE

Three national guard soldiers in their early 20s with no relevant past medical history presented to a tertiary care level 1 trauma center after a large volume JP-8 exposure occurred while they were working on the flight line at a local airbase. They stated that they were defueling an aircraft when the pressurized hose exploded, spraying fuel over their face, upper extremities, chest, and abdomen. They all reported aspirating and/or swallowing some of the fuel by accident but did not experience any fire or burns. They also reported some ocular burning, nausea,

and abdominal discomfort.

STABILIZATION AND INITIAL MANAGEMENT

As with most occupational exposures, the initial step in management is decontamination of the patient. Copious irrigation of the eyes and skin exposed to the fuel should be performed and soap should be used, if possible, for dermal exposures. This should be done ideally by EMS prior to transport or done on arrival to the ED. Exposed or contaminated clothing should be removed. Rigorous and recurrent assessments of the patient's airway, breathing, and circulatory parameters should be initiated and continuously monitored, as hydrocarbon exposure manifests through a wide spectrum of toxicity.

ACUTE TOXICITY AND MANAGEMENT

Acute toxicity, which is most relevant to the emergency physician, has several facets that deserve individual recognition.

1) Pulmonary. The pulmonary effects of hydrocarbon exposure represent

one of the most life-threatening components of JP-8 toxicity and are mediated by the physical properties of volatility, surface tension, and lipophilicity. High volatility of JP-8 and other combustion fuels cause aspirated liquid to transform to a gas, leading to displacement of oxygen and resultant hypoxia with ventilation-perfusion mismatch. Elevated surface tension causes "creep" of fluid along a solid surface and increases the risk of aspiration with oral exposures. In addition, hydrocarbons disrupt alveolar surfactant, leading to worsening pulmonary mechanics (eg, decreased compliance) and pneumonitis with interstitial inflammation, alveolar edema/hemorrhage, necrosis, and inflammatory exudates.⁵ Intubation and lung protective ventilation should be performed for refractory hypoxia or mechanical respiratory failure. Development of lipid pneumonia can also be seen for large or severe pulmonary exposures.^{3,5}

2) Cardiovascular. All hydrocarbons, JP-8 included, sensitize the

myocardium through unknown mechanisms; however, some substances like halothane and chloroform stabilize ion channels blocking myocardial depolarization.⁵ It is theorized that slowed gap junction conduction also contributes to profound myocardial dysfunction, which is manifest though recalcitrant ventricular dysrhythmias often precipitated by a sudden catecholamine surge. This sensitization is possible through any exposure means, including dermal, pulmonary, and gastrointestinal. Bicarbonate should be considered in those patients with wide complex tachycardias as a result of the exposure; however, as described, the pathophysiology of cardiotoxicity is multifactorial and may require ECMO or other invasive measures aside from high-quality advanced cardiac life support.⁵

- 3) Gastrointestinal. When ingested, hydrocarbons are primarily gastric irritants, frequently causing spontaneous vomiting and GI discomfort. There have been case reports of hemorrhagic gastritis; however, this is more common in large volume ingestions and is more classically seen with isopropyl alcohol ingestion.^{3,5} Symptomatic care is indicated for these patients and includes viscous lidocaine, antiemetics, and analgesia if other contraindications do not exist.
- 4) Dermal. Chronic or prolonged skin exposure to JP-8 and other hydrocarbons leads to partial or full thickness skin necrosis via a defatting process. These substances also serve as immune sensitizing agents, and patients can present with allergic dermatitis similar to poison ivy or other delayed type IV hypersensitivities. The dose of hydrocarbon absorbed is proportional to the area of skin exposed and the duration of exposure.⁵ Similarly, although less common, ocular manifestations include hyperemic conjunctiva and a burning sensation.³ Decontamination with soap and water for skin contact and irrigation

for ocular exposures is effective in decreasing ongoing toxicity to the patient and ensuring the safety of the health care team.

Tip: Although cardiovascular and pulmonary toxicity are most life threatening with JP-8 exposure, most individuals exposed to JP-8 or other hydrocarbons orally likely will present with less severe symptoms such as gastrointestinal distress, nausea, and vomiting.

CHRONIC TOXICITY

Chronic exposure to JP-8 has shown to be directly cytotoxic with cells altering gene expression causing untimely cell death with concomitant dysregulation of DNA maintenance and metabolism controlling proteins. Workers exposed to high quantities of JP-8 were at high risk for development of rare malignancies and early death.⁶ Some limited evidence also supports the development of neurotoxicity with adverse effects on mood, cognition, balance, and hand grip.⁷ Although the diagnosis of chronic JP-8 toxicity likely exists outside of the emergency department, the emergency physician should be able to recognize a symptomatic patient whose history is consistent with chronic military fuel or other hydrocarbon exposure. These individuals should be referred to primary care or to an occupational toxicologist.

ENVIRONMENTAL EFFECTS

Volatile organic compounds such as those in JP-8 have far-reaching epidemiological consequences, as stated above. The Red Hill incident affected more than 90,000 service members and families, took approximately three months to restore potable water, and created a two-year continual water-testing requirement in addition to the labor-intensive Red Hill water well clean-up.¹ Runoff not only creates a health hazard due to exposure, but with a flashpoint of 100.4F poses a very real threat of volatile explosion should vapors accumulate.⁸ It is important to consider that clean-up operations after a spill or explosion place relief workers at health risk due to inherent

exposures, as was seen following the British Petroleum Deepwater Horizon oil rig explosion in 2010. Additionally, chemical dispersants used for clean-up operations have their own potential effects, many of which have little research.⁹

CASE CONCLUSION AND LEARNING POINTS

Fortunately, all three National Guard soldiers did not have any signs of symptoms of acute JP-8 toxicity. After an appropriate observation period and negative chest X-rays, all were discharged back to base.

Occupational exposures are a constant, albeit infrequent, threat that the emergency physician must be prepared to recognize and treat. Exposure to JP-8 and other hydrocarbons pose the greatest danger with aspiration, but other considerations include prolonged skin contact, ingestion, and possible cardiotoxicity. Significant pulmonary pathology includes alveolar collapse, decreased compliance, impaired gas exchange causing ventilation-perfusion mismatch, respiratory failure, and rarely a lipid pneumonia stemming from fibrous tissue encapsulating damaged alveoli. Respiratory symptoms must be monitored, and if they arise, a chest radiograph with six-hour observation time should follow.¹⁰ Cardiac pathology and CNS effects are more likely seen with intentional inhalation or in patients with significant time exposure while in confined spaces. Electrocardiogram will aid in concern for dysrhythmias. Skin must be thoroughly decontaminated as soon as possible following exposure and all clothing removed. Gastrointestinal effects typically require only supportive care. Referencing chemical safety data sheets and contacting a poison control center are critical. ★

Disclaimer: The views expressed in this article do not necessarily represent the position or endorsement of the U.S. government, Department of Defense (DoD), or entities contained within the DoD.



Emergency Physicians' Perspective: Caring for Persons with Disabilities

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Although commonly thought of only as a health issue, disability is more accurately defined as a complex interaction between physical, intellectual, or emotional impairment with environmental and societal challenges. Individuals with disabilities encounter a variety of daily barriers, including the physical environment (such as wheelchair access), as well as institutional and organizational barriers that hinder access to services.

These patients constitute a marginalized population who experience significant disparities related to health care.^{1,2} Specifically, those with disabilities experience health disparities and greater unmet needs in comparison to the general population when looking at access to preventative care, interpreter services, and prevalence of certain disease processes (arthritis, asthma, cardiovascular disease, diabetes, obesity,

oral disease, and stroke).³⁻⁸

Traditional beliefs generally associate disability with negative images and experiences. This negativity hinders acceptance, devalues the lives of disabled persons, and undermines possibilities or opportunities for the person who has a disability.

At its extreme, stigmatization may result in abuse, neglect, and exploitation. There is literature to demonstrate that the quality of life and quality of care in those with disabilities are negatively influenced by severity of the patients' self-perception, poor quality nursing care, negative provider attitudes, and provider disability severity perception.³ This becomes important to remember to help health care teams refrain from objectifying a patient with a disability.

As physicians, we should acknowledge and treat the person in his/her entirety and not merely as a disease

process. Focusing on the severity of disability or ignoring the true presenting complaint may only perpetuate a lower quality of care and has a negative impact on quality of life. There is also literature to support that improving quality of care may have an even greater impact on improving quality of life than solely changing provider attitudes toward those with disabilities.³

A common source of bias or misunderstanding between health care teams and patients with disabilities relates to differing understandings regarding quality of life. Studies have demonstrated that health care teams overestimate the impact of physical disability on the patient's quality of life when compared to the patient's own estimation.⁹ In one study, 54% of patients with moderate to severe disabilities reported having a good or excellent quality of life.¹⁰

So what determines quality of life? Quality of life is an individual construct that is highly dependent on a person’s perceptions, hopes, experiences, and ambitions, as well as their culture and social interactions.

As health care professionals, we interact with and see patients with disabilities in one tiny microcosm of their world, in the hospital or the clinic, where they are the patient who may be ill or suffering. In this brief interaction and with limited information, we may make negative assumptions about their quality of life. In reality, people with disabilities will often tell you that disability and health are not the same thing, and quality of life is not determined in the hospital. We need to be aware of our tendency toward this bias in our approach to patients with disabilities, to ensure that this vulnerable population receives the same treatment as all other populations.

Another source of bias and misunderstanding is language. The language that physicians use when speaking with patients with disabilities is critical in establishing rapport and developing a therapeutic alliance based on mutual respect. In general, person-

first language is recommended when speaking to or about persons with disabilities. This means that they are persons WITH disabilities, not disabled persons. A child has Down syndrome; he/she is not a “Down’s child.” This structure recognizes them as a person first, rather than a disability first.

In addition, there are many other commonly used terms that should be eliminated in favor of more appropriate alternatives. For example, instead of “wheelchair-bound,” say “wheelchair user.” Wheelchairs are tools of mobility and freedom, and we have never seen a patient bound to one. Instead of “handicapped” in reference to parking spaces or bathroom stalls, use “accessible.” Other inappropriate words include crippled, lame, spastic, slow, retarded, crazy, dumb, or mute. Do not refer to persons without disabilities as “normal.” And finally, when speaking to patients with disabilities, whether they be physical, intellectual, psychiatric, or developmental, speak directly to them and do not infantilize them. Make eye contact and presume competence unless you have evidence or data to the contrary.

We can also contribute to establishing rapport by respecting our patients’ expertise. Patients with disabilities possess a lifetime of lived experience with their own disease or condition. Treating a patient (or a family member) as an expert-by-experience allows the person to be viewed before the disability and shows that you, as the physician, respect that experience and insight.¹¹ Some tools to communicate respectfully with your patient include: establishing how they best communicate; speaking directly to the patient; asking if they want their caregiver present; focusing on the patient’s abilities (not their disabilities); and, as always, showing warmth and positive regard.

We encourage everyone to take a moment to reflect on past encounters with patients with disabilities and to think on how future interactions can be improved. ★

A version of this article was previously published and first appeared in the August 2018 issue of SAEM Pulse, the official membership publication of the Society for Academic Emergency Medicine.

LANGUAGE MATTERS

Instead of	TRY	Instead of	TRY
✗ The disabled, handicapped	✓ Person with a disability	✗ Insane, crazy, psycho, maniac, nuts	✓ Person with an emotional or behavioral disability, person with a mental health or a psychiatric disability
✗ Normal person, healthy person	✓ Person without a disability	✗ Hearing impaired, dumb, mute	✓ Person who is deaf
✗ Retarded, slow, simple, moronic, defective, afflicted, special person	✓ Person with an intellectual, cognitive, developmental disability	✗ Confined or restricted to a wheelchair, wheelchair bound	✓ Person who uses a wheelchair
✗ Afflicted by multiple sclerosis	✓ Person with multiple sclerosis	✗ Handicapped parking or bathroom	✓ Accessible parking or bathroom
✗ Crippled, lame, deformed, invalid, spastic	✓ Person with physical disability		
✗ Has overcome his/her disability is courageous	✓ Person who is successful, productive		

Case Series: Prehospital POCUS Aids in Shortness of Breath Diagnosis

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INTRODUCTION

Prehospital studies on the diagnostic potential of the FAST examination have shown little benefit as the prehospital time frame may be too early to detect significant intra-abdominal bleeding.¹ However, other studies like focused echocardiographic evaluation in life support (FEEL) and prehospital application of sonography in emergencies (PHASE) show that prehospital POCUS can be successful.^{2,3}

The FEEL trial explored physicians performing prehospital sonographic evaluations in patients with shock or in cardiac arrest and showed that ultrasound altered management in 78% of the cases.

The PHASE trial was a pilot study following paramedics successfully differentiating between cardiac activity versus standstill on ultrasound with minimal training.

Chronic obstructive pulmonary disease (COPD) and congestive heart failure (CHF) are two common comorbidities that are frequently evaluated in the prehospital setting. Both of these disease exacerbations can present with the chief complaint of dyspnea or “shortness of breath” and as such need to be differentiated diagnostically.

Our campus alone received more than 200 calls over a 12-month period

regarding shortness of breath from patients with a history of either COPD or CHF. In one year, from February 2019-20, 10 prehospital cases were treated for shortness of breath, usually with nebulizer treatments, but were then found to have a CHF exacerbation after ED work-up and started on the appropriate treatment of nitrate, diuretic, or positive pressure ventilation.

A large portion of our population has a history of both COPD and CHF, which can make the prehospital treatment of dyspnea more complicated. For example, four different prehospital cases of shortness of breath were diagnosed with both COPD and CHF exacerbations upon ED work-up.

Several studies have demonstrated the increased sensitivity and specificity of point-of-care ultrasound (POCUS) in appropriately diagnosing CHF versus COPD.^{5,6,7} Pulmonary edema in a CHF exacerbation can be identified on ultrasound by B-lines, a comet-tail reverberation artifact. A two-patient case series in 2010 expanded upon this knowledge and illustrated how prehospital POCUS, when used by EMS for the chief complaint of shortness of breath, could appropriately diagnose and assist in the correct management of the undifferentiated dyspneic patient.⁴

However, the Emergency Medical Services and Bilateral Lung Ultrasound

Chief Complaint	SOB (184)								
EMS Diagnosis	COPD (78)			CHF (13)			SOB (93)		
ED Diagnosis	COPD (65)	CHF (10)	Both (3)	COPD (1)	CHF (12)	Both (0)	COPD (31)	CHF (31)	Both (1)

FIGURE 1: EMS charts from February 2019-20 with the prehospital chief complaint of SOB, an EMS-presumed diagnosis of COPD, CHF, or unknown SOB based on treatments, and an ED diagnosis of CHF, COPD, or both. The ED diagnosed 30 patients with an EMS diagnosis of SOB with a different diagnosis other than COPD, CHF, or both. Examples of these diagnoses would be “cough” or “chest pain.”



in Emergency Medicine (EMS BLUE) study in 2017 tried to assess the feasibility of paramedics performing prehospital lung ultrasounds in medical patients in respiratory distress.⁸ The study fell short of meeting their thresholds for feasibility, but our resident-physician-assisted ride-along cases suggest a strong argument for its use.

CASE SERIES: CASE 1

A 52-year-old female with a past medical history of end-stage renal disease (ESRD) on peritoneal dialysis called EMS for shortness of breath over the previous three hours. The patient reported a history of dialysis but did not recount any specific history of COPD or CHF. Per chart review later, the patient also had a history of sarcoidosis, diabetes, hypertension, and hyperlipidemia.

Upon EMS arrival, the patient appeared uncomfortable, in moderate respiratory distress. She was saturating 60% on room air and was immediately placed on a non-rebreather (NRB) mask with improvement of her oxygen saturation to 100%.

Due to the patient's incomplete knowledge of her medical conditions, the team performed portable ultrasound imaging of the patient's lungs in the ambulance, which showed more than three B-lines per high-powered field anteriorly. This suggested pulmonary edema/fluid overload causing respiratory distress instead of other etiologies such as bronchoconstriction or pneumothorax.

In the ED, the patient was placed on noninvasive positive-pressure ventilation (NIPPV), and oxygen saturation remained at 100%. Her blood pressure was 184/106 mmHg. A chest X-ray

revealed pleural effusions and pulmonary edema, which was likely acute volume-overload secondary to uncontrolled hypertension and renal failure on dialysis in the setting of ESRD. The patient remained stable during her ED stay with improvement of her respiratory distress and oxygenation and was admitted to the hospital for further care and monitoring.

CASE SERIES: CASE 2

A 74-year-old female with a past medical history of CHF, COPD, hypertension, and cardiomyopathy on baseline 4-liter home oxygen called EMS for shortness of breath. The patient said her symptoms developed over a period of months and worsened over the past four days, especially during ambulation to the restroom.

The patient was saturating at 94% on nasal cannula while seated and 89% with

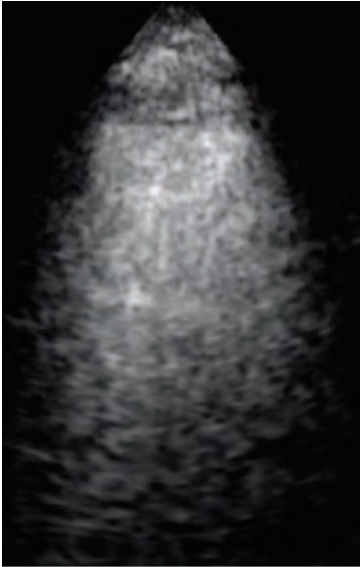


FIGURE 2: Portable ultrasound of lungs showing horizontal A-lines, an artifact indicating normal lung surface



FIGURE 3: Portable ultrasound of lungs showing vertical B-lines, a comet-tail reverberation artifact representing the ultrasound waves interacting with an air/fluid medium, suggestive of pulmonary edema

speaking and exertion. She had a blood pressure of 112/52 mmHg with a respiratory rate of 22 rpm. On physical examination, the patient surprisingly did not have wheezing, rales, or rhonchi. On further evaluation, she had no jugular venous distension or peripheral edema either. However, the patient did have pursed lip exhalation, tachypnea, and increased dyspnea from baseline. The patient endorsed taking furosemide daily and recently started spironolactone as prescribed by her primary care doctor.

Due to the unclear etiology of her symptoms, a portable ultrasound examination was performed while in the ambulance during transport to the hospital. The pulmonary examination did not show more than three B-lines per high-powered field anteriorly or laterally in bilateral lungs and showed lung sliding throughout. This suggested COPD causing respiratory distress instead of other etiologies such as CHF or pneumothorax.

In the ED, the patient received albuterol inhaler treatments with improvement of her symptoms, and her respiratory rate improved from 22 to 16 respirations per minute (rpm). The patient was evaluated with a chest

computed tomography angiography (CTA) due to an elevated D-dimer, which showed no pulmonary embolism, pleural effusion, or pneumothorax. In addition, her COVID-19 test was negative. The patient was able to ambulate in the emergency department without any difficulty or hypoxia and was discharged with primary care follow-up for her COPD exacerbation.

CASE SERIES: CASE 3

A 57-year-old female with a past medical history of CHF, COPD on 2 liters home oxygen, automatic implantable cardioverter-defibrillator (AICD), diabetes mellitus, hypertension, and hyperlipidemia called EMS for shortness of breath. The patient described dyspnea symptoms for two days with increased lower extremity edema. The patient noted she was supposed to be on furosemide but had not taken it in several days. She also reported being intubated once in the past for similar symptoms.

The patient was saturating 99% on 2L nasal cannula with a blood pressure of 155/90 mmHg and a respiratory rate of 28 rpm with increased work of breathing. On auscultation, the patient had diffuse

wheezing in all lung fields and bibasilar rales. Additionally, the patient had +2 edema in her lower extremities. Due to the wheezing on auscultation, EMS placed the patient on NIPPV and administered ipratropium/albuterol.

Portable ultrasound in the ambulance during transport showed more than three B-lines per high-powered field in bilateral anterior and lateral lung fields. Portable ultrasound and physical examination suggested a multifactorial cause of patient's dyspnea, which included both CHF and COPD exacerbations.

In the ED, the patient was transitioned from CPAP to 2L nasal cannula due to her improved work of breathing, with respiratory rate of 20 rpm and saturation of 100%. Her physical examination in the ED was documented as scattered wheezing, diminished breath sounds, and pitting lower extremity edema. Her BNP was 504 correlating with a CHF exacerbation component. Her CXR was consistent with pulmonary vascular congestion without pneumothorax. A COVID-19 swab was negative. The patient was given several medications during her ED stay, including: albuterol nebulizers, methylprednisolone, furosemide, and aspirin.

Following treatment, the patient had resolved wheezing and improved work of breathing. She was admitted to the hospital under monitored care for both COPD and CHF exacerbations.

CASE SERIES: CASE 4

A 47-year-old female with a past medical history of undifferentiated asthma vs. COPD, seizures, migraines, and breast cancer presented to her primary care physician's office for her scheduled office visit. However, upon arrival, the patient developed worsening shortness of breath that had started earlier in the day, and EMS was called. The patient noted she had tried albuterol inhaler treatments at home with no improvement. She additionally described dyspnea with lying flat and subjective swelling throughout her body.

Upon arrival, the patient was saturating 95% on 4L nasal cannula,

placed by her primary care provider, with a blood pressure of 132/104 mmHg and respiratory rate of 20 rpm with accessory muscle use. On further physical examination, she had scattered wheezing and decreased breath sounds with trace lower extremity peripheral edema. The patient was started on an ipratropium/albuterol nebulizer by EMS.

During her initial nebulizer treatment in the office, her portable ultrasound lung examination showed lung sliding in anterior, posterior, and lateral lung fields bilaterally with no B-lines visible. This suggested a bronchoconstrictive etiology over pulmonary edema.

In the ED, the patient had improved wheezing and decreased accessory muscle use. Her chest X-ray showed no obvious acute process, and her COVID-19 test was negative. She was given albuterol and methylprednisolone while in the ED. Following her treatments, she had further improvement in wheezing and was admitted for further evaluation to the pulmonary service for asthma/bronchitis exacerbation with the concern that she had needed multiple breathing treatments and had a history of intubation secondary to those symptoms.

DISCUSSION

Shortness of breath is one of the most common EMS chief complaints, with the majority of our population endorsing a history of COPD, CHF, or both. Both disease exacerbations can present similarly with dyspnea, diminished breath sounds, tachypnea, hypoxia, and wheezing. Per our institution's annual EMS arrivals for the chief complaint of shortness of breath, 10 patients were given nebulizer treatments, the appropriate management for COPD exacerbations, but then diagnosed with a CHF exacerbation after ED work-up.

An additional 10 patients with a history of COPD and CHF over the past year were started on oxygen prehospital, when further data about their pulmonary status, such as pulmonary edema, if obtained in the prehospital setting, could have expedited or narrowed ED workup and treatment.

It is important to keep in mind that data was pulled from an initial EMS

complaint of shortness of breath with the ED diagnosis of COPD, CHF, or both. This excludes patients who had a different ED diagnosis such as asthma, fluid overload, shortness of breath, etc.

Pharmaceutical interventions have both risks and benefits. Nebulizer treatments may worsen tachycardia, and steroids may make blood sugar management more challenging. Failure to intervene may result in intubation in a population with a high risk and difficult airways. These cases strongly suggest that if prehospital systems were equipped with point-of-care ultrasound, it would aid in the diagnosis of the dyspneic patient, especially in those with a history of CHF or fluid overload of other etiology and COPD or lung parenchyma disease, as POCUS can visualize B-lines suggestive of pulmonary edema.

Prehospital POCUS is quick, non-invasive, and effective. It would have little extra cost to the patient and may be financially beneficial to the patient and health care system by decreasing nebulized treatments in the dyspneic patient when the patient instead would benefit from shifting and diuresing fluid. This prehospital diagnostic guide could have even further triaging capabilities and applications in fluid-overloaded patients — dialysis patients, for example — who are confined to their homes during floods or natural disasters. This application could assess pulmonary fluid status to aid in a decision of whether or not to transport a patient via helicopter from home, or wait an additional day or two for water levels to recede during times of natural disasters. For all of these reasons, real-time evaluation with POCUS of the acutely dyspneic patient can be an invaluable prehospital tool.

IMPORTANCE OF AWARENESS

In Case 1, the patient was accurately and effectively diagnosed with fluid overload with the utilization of ultrasound. This expedited her care on arrival to the ED and allowed for the correct medication administration and avoided other unnecessary treatments that target bronchoconstrictive etiologies.

In Case 2, it is important to note that during prehospital transport, the

patient was not able to receive breathing treatments, as she did not meet the physical examination criteria — including wheezing — per regional paramedic protocols to start such interventions. Her portable ultrasound examination placed COPD as a more likely etiology of her symptoms and could have expedited her care and even decreased her ED disposition time. It is important to consider not only the impact prehospital ultrasound can have on patient care, but also the effect it can have on rethinking and restructuring prehospital treatment protocols.

In Case 3, this patient's bedside ultrasound in the ED showed B-lines bilaterally, a plethoric IVC, and a decreased cardiac ejection fraction. Prehospital ultrasound showing B-lines alerted ED staff immediately on arrival that the cause of the patient's symptoms was multifactorial and expedited her care.

In Case 4, the patient's prehospital ultrasound examination placed CHF and pneumothorax lower on the differential. Following effective communication between prehospital and ED teams, the patient received only one nebulizer treatment, a COVID-19 test, and a chest X-ray. Unnecessary laboratory testing such as BNP or other invasive testing was avoided due to prehospital imaging and effective communication.

The utilization of ultrasound in the prehospital setting has potential benefits with limited downside. This case series demonstrates the different benefits of prehospital POCUS performed by our clinicians during a ride-along. However, we were limited in having resident physicians acquiring and interpreting these images. We aim to further explore the utility of training our EMS clinicians in the use of POCUS, and we hope that prehospital image acquisition can lead to earlier diagnosis and shorten time to appropriate medical intervention.

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Remember to Inspect the Skin: A Clue to Diagnosing VZV Encephalitis

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Meningitis, inflammation of the tissue surrounding the brain and spinal cord, can be a result of viral, bacterial, or fungal infection. Viral causes are more common, with enterovirus leading the pack on causes of meningitis.¹

The incidence for viral meningitis in the United States is fairly low, which may be due to reporting patterns, but has been noted to be higher in certain countries.^{1,2}

While viral meningitis usually has a less complicated course compared to bacterial, there are certain viruses — such as herpes (HSV) and associated viruses such as varicella-zoster (VZV) — that may lead to increased neurological complications. While VZV is common in populations around the world from

childhood to adulthood, it is mainly limited to cutaneous manifestation (varicella causing chickenpox in younger populations and reactivation of the virus causing zoster in adults).^{3,4} Reactivation of VZV usually occurs in adulthood and is due to reactivation in the dorsal root ganglia after primary infection.⁵ This commonly causes a painful vesicular rash in a dermatomal distribution called herpes zoster and can subsequently cause post herpetic neuralgia. Reactivation of VZV also has been linked with neurological complications such as vasculopathy, myelopathy, neuropathy, and meningitis/encephalitis.⁶ Although believed to be rare, VZV is actually noted to be the third most frequent cause of viral/aseptic meningitis in the world.⁴

We present a case of an

immunocompetent, elderly patient who developed VZV meningitis/encephalitis and subsequent status epilepticus after being diagnosed several days prior with cutaneous zoster infection.

CASE PRESENTATION

The patient is a 73-year-old female who was recently seen in the ED and diagnosed with varicella zoster infection. At that time, she was started on valacyclovir and discharged back home. She then presented back to the ED two days later with concern for altered mental status as well as generalized weakness. A physical exam showed a vesicular rash over the left posterior shoulder, noted by nursing staff. The patient's vital signs were normal, and there was no focal weakness

or numbness. There was a vesicular/shingles-type rash over her left shoulder in a dermatomal pattern.

The patient presented to a community ED with concern for stroke versus seizure-like activity. She was subsequently transferred for a higher level of care. Upon arrival at the tertiary center, the patient developed a seizure. She was treated with 4 mg lorazepam, given levetiracetam as well as phenytoin without resolution, and subsequently was intubated for airway protection and started on propofol. A CT and CTA of her head did not show any large vessel occlusion or other acute process. Given the skin exam findings initially noted by nursing staff, a lumbar puncture was performed on hospital day zero, and a meningitis panel was positive for VZV as well as high protein load.

DISCUSSION

Meningitis is a cause for concern when it comes to a patient in the ED. It is one of those can't-miss diagnoses, as there are devastating neurological complications that can occur if bacterial, fungal, or certain viral infections go untreated.

Incidence rates vary based on country and age group, depending on reporting requirements. Viral meningitis has been reported as the most common culprit, with VZV being third behind enterovirus and HSV-2 as far as viruses go.⁴

The most common symptoms that may lead you down the path toward diagnosing meningitis include fever, headache, photophobia, and neck stiffness.^{2,7} Other symptoms include confusion, delirium, and nausea/vomiting, along with signs of increased intracranial pressure such as seizures or focal neurological deficits, which tend to carry a worse prognosis.⁷

In specific cases, such as the VZV meningitis/encephalitis mentioned, there may be cutaneous manifestations that may help clue you into the diagnosis (although these are not always present).⁸ Even for VZV meningitis, the most common symptoms were the ones previously mentioned, including fever, headache, and neck stiffness.⁴

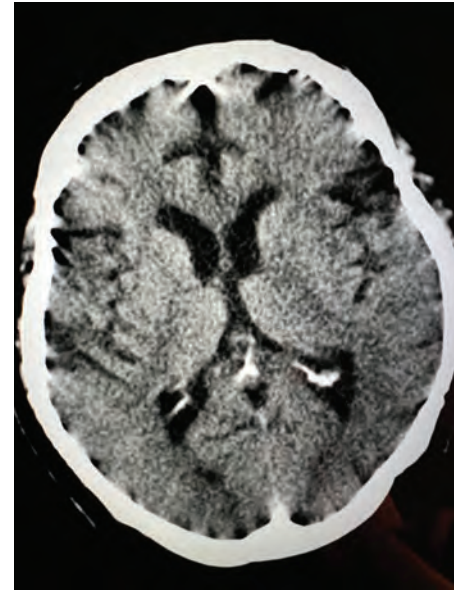
Once you are heading down the path of meningitis, the next step of diagnosis

is performing a lumbar puncture. Certain cases — such as immunocompromised state, recent seizures, history of central nervous system (CNS) disorders, focal neurological findings, or other findings of increased intracranial pressure — would warrant CT imaging prior to performing a lumbar puncture, but in most cases this is not necessary.² CSF should be sent off for evaluation of cell count, protein, glucose, culture, gram stain, and meningitis/encephalitis PCR panels. As is the case for most aseptic meningitis, VZV included, pleocytosis is commonly noted but not always present. Elevated CSF to serum albumin ratio is present in VZV vasculopathies, myelitis, facial palsy, and encephalitis.⁹ Encephalitis panel is usually also positive, but time to results can vary. Other lab work is nonspecific in the diagnosis of VZV meningitis/encephalitis, including inflammatory markers or neuroimaging.^{4,9}

Treatment should be started without delay on patients with concern for meningitis. In cases of possible bacterial meningitis, treatment includes ceftriaxone and vancomycin; depending on the patient's age, the addition of ampicillin may also be considered. In certain populations such as immunocompromised patients, the addition of antivirals and antifungals may also be necessary.

While most viral meningitis has an uncomplicated course and mainstay of treatment is supportive care with antipyretics and hydration, certain infections such as HSV and VZV require treatment.^{1,2} Based on Infectious Diseases Society of America guidelines, treatment is usually 10-14 days of IV acyclovir, with severe cases requiring up to 21 days of treatment. Certain reports have shown that oral valacyclovir can have similar efficacy without complications that can occur with prolonged hospitalization.¹⁰

Even with appropriate treatment, there is a reported 9-20% mortality rate in cases of encephalitis. In most patients who survive, neurological sequelae ranging from mild to severe are still reported. There are fewer outcome results for cases of VZV meningitis, although it appears to be more common in younger populations with less



mortality or major neurological deficits.⁹

The pathophysiology of viral spread to the meningeal space has been debated and is still not fully understood. It has been proposed that it may spread to nerve roots close to the CNS, facilitating transfer to the meningeal space. It also has been theorized that there is hematogenous spread to the CNS.⁵

CONCLUSION

The patient remained intubated for nearly 10 days. Her status epilepticus resolved, and she was treated with acyclovir. The patient subsequently was extubated with a guarded prognosis. ★

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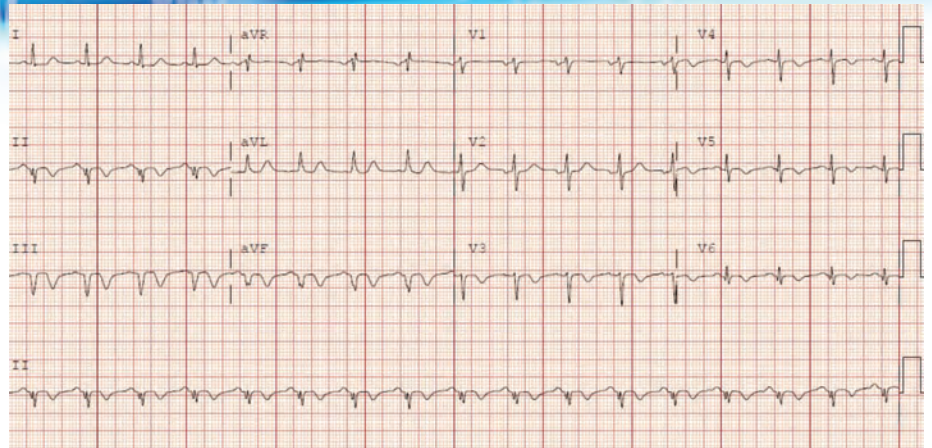
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CASE

A 62-year-old male presents with chest pain that has been gradually worsening over the past 2 weeks.

What is your interpretation of his ECG?

See the ANSWER on page 68.



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ECG Challenge

This ECG shows sinus tachycardia at 102 bpm, left axis deviation, normal intervals, TWI in leads II, III, aVF, and V3-V6, and Q-wave in leads II, III, and aVF.

Q-waves are the initial negative deflection that precede the upright R-wave of the QRS complex and can be pathological or non-pathological. Pathologic Q-waves are generally defined as ≥ 40 msec and/or ≥ 25 -33% of accompanying R-wave height. Causes of pathologic Q-waves include structural, conduction, and/or myocardial etiologies (see table below in Learning Points).

A QS complex is used to describe a single large negative deflection, which is seen in leads III and aVF in the case ECG. When associated with ischemia, QS complexes typically indicate significant irreversible myocardial loss. When associated with recent MI, QS complexes with STE and diminished T-waves, typically seen in the precordial leads, should prompt evaluation for LV aneurysm.

In the past, MIs were classified as Q-wave MI and non-Q-wave MI. These terms are no longer used, but misconceptions based on this classification system persist. Current cardiology research has shown:

- Q-waves do not predict viability of myocardium
- Q-waves correlate with size of the infarction but do not differentiate between transmural and non-transmural/subendocardial infarction
- Large Q-waves that suggest a large infarction are associated with a high risk for LV dysfunction, but LV dysfunction can occur in the absence of Q-waves
- Q-waves associated with infarction are not permanent and can resolve or diminish over time

Case Conclusion

Cardiology was emergently consulted and took the patient to the cardiac catheterization lab, where a proximal RCA occlusion was successfully treated with a stent.

Q-waves Learning Points

- Can be pathological or non-pathological
- Pathologic Q-waves generally defined as ≥ 40 msec and/or ≥ 25 -33% of accompanying R-wave height
- When due to an MI:
 - Occur in ≥ 2 contiguous leads that also have STE
 - Size correlates with volume of infarcted myocardium
 - Early appearance of Q-waves does not always indicate irreversible myocardial death, particularly with simultaneous STE and/or shorter period of ACS symptoms
 - Tall R-waves in leads V1 and V2 may represent Q-waves due to a posterior MI
- QS complex = single large negative deflection
 - Usually indicates significant irreversible myocardial loss when associated with ischemia
 - QS complex with STE and diminished T-wave should prompt evaluation for LV aneurysm
- Q-waves in leads V1 and V2 can be caused by misplacement of leads in the 2nd or 3rd intercostal spaces

CAUSES OF PATHOLOGIC Q-WAVES	
STRUCTURAL	LVH RVH HCM
CONDUCTION	LBBB Pre-excitation rhythms
MYOCARDIAL	Infarction Cardiomyopathy Myocarditis Infiltrative disease

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- 1. An 8-month-old boy is brought in because he has been crying inconsolably for 2 hours. He has no history of excessive crying, recent illness, or injury. His vital signs include P 110, R 34, and T 37.4°C (99.3°F); SpO₂ is 99% on room air. Examination of the exposed infant reveals that he is well-developed and well-nourished. Skin and coloring are normal without rash or bruising. He has no obvious musculoskeletal abnormalities and does not cry more with palpation. The chest is clear of rales and rhonchi, but a cardiac examination is notable for a vibratory systolic ejection murmur grade 2/6 he has had since birth. Which diagnostic test should be performed?**

A. CBC
B. Chest x-ray
C. Echocardiogram
D. Fluorescein staining of corneas
- 2. A 37-year-old woman presents with complaints of a large piece of steak stuck in her throat. She is able to swallow her own secretions but has not attempted to drink or eat. She has had impactions and episodic symptoms of heartburn before despite regular use of a proton pump inhibitor. After a few minutes, her symptoms resolve, and she can drink water. What is the most appropriate disposition?**

A. Admit for close observation for complications
B. Arrange for urgent endoscopy in the emergency department
C. Discharge home with a referral for outpatient endoscopy
D. Observe for 6 hours and discharge if she remains asymptomatic
- 3. A 28-year-old woman presents with abdominal bloating, diarrhea, and flatulence for the past week. She recently returned from a hiking trip and, when asked, admits to drinking water from a spring. Her vital signs include BP 110/68, P 82, R 18, and T 37.1°C (98.8°F). The physical examination is normal, and she is otherwise healthy. What is the best test to confirm the diagnosis of giardiasis?**

A. Serum antibody
B. Stool antigen
C. Stool bacterial culture
D. Stool ova and parasite
- 4. A 20-year-old woman presents asking to be tested for an STI. She was recently with a new sexual partner and has noticed some mild discharge. The pelvic examination reveals no cervical motion tenderness. What is the most appropriate management at this time?**

A. Confirmatory testing, then treatment only if positive
B. Single dose of both azithromycin and ceftriaxone
C. Single dose of ceftriaxone and 7 days of doxycycline
D. Single dose of ceftriaxone and 14 days of doxycycline and metronidazole
- 5. When attempting transvenous pacing, what is the preferred site for access?**

A. Right external jugular vein
B. Right femoral vein
C. Right internal jugular vein
D. Right subclavian vein

Continued from page 5

family medicine training for example, who go on to staff EDs without being residency-trained in EM.

It's also essential to note that half of medical students are below average, but, thanks to our educators, educational resources, and the accreditation processes in place for medical schools and residencies, the majority of them go on to become excellent physicians who do what is best for their patients. Likewise, EM residents who join their programs through the SOAP can become excellent physicians and make a lasting impact on their programs. EMRA is as proud to represent these resident members as we

shadowing and EMIG activities is foundational to effective recruiting and should be standard across schools. Residents should be mentoring EM-interested students where possible, locally or through EMRA's Student-Resident Mentorship Program.

Third-year EM clerkships must be available and accessible. For students without a home EM rotation, particularly DO students, we recommend the CORD guide designed to direct them through the rotation and application process.

In their clerkships, we must ensure that students feel they are part of the workflow and are valued in the emergency department. They should actually be talking to patients and participating

SOLUTIONS: THE FUTURE OF OUR SPECIALTY

We need to ensure that students, our colleagues, and our patients understand that, though we are concerned about these challenges, we are led by EM residents, mentors, and partners tackling these issues head-on. We are focused on innovative solutions that address specific barriers to providing efficient, effective care.

In the wake of the workforce study, we want your transition from medical school to residency, and residency to the job market, to be as smooth as possible. That's why we've reinvigorated our emCareers site and launched EMBark, your career-planning center, where you'll

“We should always be able to acknowledge the honor it is to serve patients who have no one else to care for them. To bring people back from the brink of death. To sit with people on the worst days of their lives. To be part of awesome teams, and to have space in our lives for family, diverse career interests, and so much more.”

are of the ones who matched at the top of their rank list.

However, the process of obtaining a placement through the SOAP is extremely stressful for the applicant as well. Immediately after finding out they're unmatched, they must reach out to programs and commit themselves and their families to living 3 to 4 years in a city they may have never seen and train in a program they know very little about. Addressing these trends and decreasing the number of residents matching through the SOAP is not intended to disparage these applicants. It is intended to benefit those who would be sent through the SOAP.

SOLUTIONS: SUPPORTING STUDENTS

We must accept that, ultimately, students choose the specialty they feel is their best fit. But if we want to ensure that students give EM a fair chance, we need to recruit consistently across medical schools and from pre-med shadowers to the residency interview trail.

Investing time and support in

in procedures, not treated as an inconvenience or a scribe.

Throughout their acting internships, they'll be less likely to be relegated to the SOAP if they get excellent direct feedback and have a chance to reach their greatest potential before their SLOEs are submitted.

SOLUTIONS: AT THE PROGRAM LEVEL

When it comes to the application and interviewing process, programs that are routinely unfilled by the Match must adapt quickly. Programs with difficulty matching must accept that they are competing with a larger-than-ever number of programs for a small subset of applicants. It may be time to re-evaluate their ERAS filters and interview more DO and IMG applicants.

On the EMRA side, we are working to share the perspectives of DO and IMG residents who have secured EM residency positions in order to share their advice with upcoming applicants to EM, and we would encourage our members to review CORD's guides such as their IMG Applying Guide.

find resources and information dedicated to helping you plan your professional path as you progress through medical school and residency.

The unfavorable workforce projections are attributed to several trends in the world of EM employment, such as corporate entities' influence on hiring, firing, and the practice of medicine; PA and NP independent practice; and the expansion of residency positions, among others. To educate residents on these issues, we provide the Emergency Medicine Advocacy Handbook for free online. To take an active role in educating your fellow residents on these topics and guiding EMRA's response to these conflicts, join the Health Policy Committee or Administration and Operations Committee.

Leaders in EM are also examining the practices of specialties that have become more attractive during the same time period. Since 2020, applicants to anesthesia have increased by about 20%. It's an important comparison, because anesthesia has rebounded well from concerns that it too had an oversaturated

job market with competition from CRNAs. Anesthesia adapted by expanding into pain clinics, becoming interventionists, and taking on a supervisory role for OR anesthesia. This innovation is part of what has made anesthesia an extremely attractive specialty again. This could be analogous to the many ways EM is responsibly expanding its scope, such as through telemedicine, sports medicine, urgent care centers, rapid diagnostic centers, and more.

ED boarding has also been increasingly challenging, causing worse outcomes for both patients and residents. EMRA signed a letter penned by ACEP leadership calling for the White House to convene a summit of leaders in health services to address this complex issue and identify solutions across our health care system.

In the meantime, boarding poses a threat to EM residents' education. This crisis is especially concerning for EM residents who must continue to manage boarding patients even after they are

admitted. This is an area where EMRA leaders can advocate at the program level to ensure EM residents remain focused on the undifferentiated patients who need an EP and are not yet admitted. The gridlock has kept our hospitals on diversion for weeks or months at a time, limiting our exposure to critically ill transfer patients who need advanced treatment at our academic centers. Now is the time for us to share these concerns.

To address burnout, EMRA believes first in mitigating unnecessary stressors that push us to unhealthy levels of stress. EMRA leaders serve as our bridge to the ACGME, the AMA, CORD leadership, and other program leaders to advocate for fair working conditions, adequate leave, and security in seeking mental health support.

The expansion of residency programs is a unique challenge, especially in regions where more residents are graduating than local job markets can accommodate.

For now, it's up to program leadership to determine whether they

are expanding their residency programs for educational and training purposes, or whether these spots are being used simply as a profitable workforce for the emergency department.

The role of regulatory bodies like the ACGME is limited, in that they are intended to control the quality of our training, and not the availability of jobs.

When we address these issues with solutions instead of cynicism and divisiveness, I think it's easier for our frustrations and gratitude to coexist.

Through every storm our specialty has weathered in the last half a century, that gratitude has remained.

We should always be able to acknowledge the honor it is to serve patients who have no one else to care for them. To bring people back from the brink of death. To sit with people on the worst days of their lives. To be part of awesome teams, and to have space in our lives for family, diverse career interests, and so much more. It's up to us to protect that legacy. ★

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Faculty Positions, Emergency Medicine

The George Washington University Medical Faculty Associates, an independent non-profit academic clinical practice group affiliated with The George Washington University, is seeking full-time academic Emergency Medicine physicians. The Department of Emergency Medicine provides staffing for the emergency units of George Washington University Hospital, United Medical Center, the Walter Reed National Military Medical Center, and the Washington DC Veterans Administration Medical Center. The Department's educational programs include a four-year residency and ten fellowship programs.

Responsibilities include providing clinical and consultative service; teaching fellows, residents, and medical students; and maintaining an active research program. These non-tenure track appointments will be made at a rank (instructor/assistant/associate/full professor) and salary commensurate with experience.

Basic Qualifications: Applicants must be American Board of Emergency Medicine or American Osteopathic Board of Emergency Medicine certified or have completed a residency certified by the Accreditation Council for Graduate Medical Education or American Osteopathic Association, and be eligible for licensure in the District of Columbia, at the time of appointment.

Application Procedure: Complete the online faculty application at <http://www.gwu.jobs/postings/97288> and upload a CV and cover letter. Review of applications will begin November 10, 2022, and will continue until positions are filled. Only complete applications will be considered. Employment offers are contingent on the satisfactory outcome of a standard background screening.

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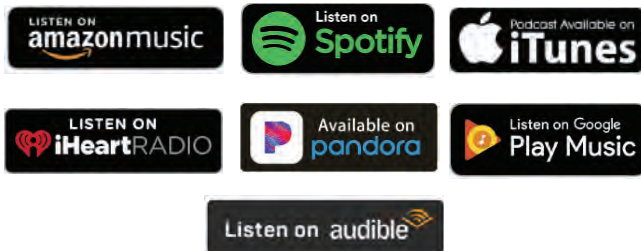
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A GUIDE TO STUDENT LOAN REFINANCING

If you're trying to figure out how to best manage student debt, you're not alone. Today, 44 million Americans collectively owe nearly 1.75 trillion dollars in student loan debt.¹ And a significant piece of that is made up of medical students – with over 75% of U.S. medical students graduating with debt, and the average med school graduate owing \$241,600.²



Needless to say, the burden of student debt can feel overwhelming – especially for physicians who have exceedingly high student loans. And with the federal interest and payment pause ending on December 31, 2022, you may be wondering what to do next. Educating yourself on your options and planning accordingly can help ease some of this financial stress. In this article, we'll detail different federal repayment options, as well as talk about student loan refinancing – which is where Laurel Road specializes in tailored options for physicians.

Understanding Federal Repayment Options

Physicians with federal student loans have several of different repayment options available, including direct consolidation, income-driven repayment, and Public Service Loan Forgiveness (PSLF).

DIRECT CONSOLIDATION

Consolidation allows you to combine multiple federal student loans into one loan with a single monthly payment. The new loan will have a repayment term from 10-30 years. Since consolidation combines the

weighted average interest rate of your loans, it usually does not offer any interest savings and a longer repayment period means you will likely pay more in interest over the life of the loan. Note, private student loans are not eligible for consolidation.

INCOME-DRIVEN REPAYMENT (IDR)

IDR plans allow you to reduce your monthly payment for federal loans according to your income – typically a portion of your discretionary income. Repayment periods generally range from 20 to 25 years.

Residents may want to consider future earning potential when enrolling in IDR. While it might make sense during training, monthly payments will likely match those of standard repayment plans after residency ends. Refinancing may be a more attractive option if you can lower your rate or shorten your term.

PUBLIC SERVICE LOAN FORGIVENESS (PSLF)

Physicians working in non-profit hospitals, government, or non-profit organizations, may be eligible for loan forgiveness after 10 years with the PSLF program. Physicians who are

employed full-time at qualifying public service organizations, are enrolled in an IDR plan, and make 120 qualifying payments on Direct Loans are eligible to have the remaining student loan balance forgiven after 10 years. Learn more at studentaid.gov/pslf.

For physicians, the potential savings from loan forgiveness should be balanced against the significant difference in earning potential from working in the private sector.

Student Loan Refinancing for Physicians

Laurel Road refinances student loans by paying off a member's current student loans and issuing them a new private loan. With student loan refinancing, you can refinance all or some of your federal and private student loans. Eligibility depends on lending criteria such as credit profile, monthly income, and monthly debt payments.

Since Laurel Road began in 2013, they've been supporting the financial needs of physicians. Laurel Road was the first-in-market to offer special payments for medical residents and fellows, and

are proud to continue offering special refinancing options that allow residents and fellows to pay as low as \$100/month³ during training, before your standard repayment term begins. And accrued interest will not compound while you're in training.

Regardless of whether you're a resident or practicing physician, student loan refinancing allows you to create a plan that fits your circumstances, including the opportunity for the following:

- Lower interest rate(s)
- Pay off loans faster
- Lower monthly payments
- Switch from a fixed rate to a variable rate (or vice versa)

Please be aware that by refinancing you will no longer qualify for certain federal student loan benefits, such as forbearance, income-driven repayment, and PSLF. For more information about these programs, visit studentaid.gov.

There is no one size fits all solution for tackling student loan debt. But knowing your options is the first step in towards making a strategic plan to pay down student loan debt.



EMRA MEMBER DISCOUNT

Get a **0.25% RATE DISCOUNT** when refinancing.⁴ To learn more and apply, visit laurelroad.com/EMRA and see personalized rates in under 5 minutes.⁵

1. Student Loans Owed, Federal Reserve Bank of St. Louis, Aug. 2022

2. Average Medical School Debt, educationdata.org, Dec. 2021

3. Visit www.laurelroad.com/EMRA for APR and Payment Examples and more information about the \$100 monthly payments. The \$100 payments may not be enough to cover all of the interest that accrues on the loan. Unpaid accrued interest will be added to the loan principal and monthly payments of principal and interest will begin when the Residency Period ends.

4. The 0.25% Emergency Medicine Residents Association (EMRA) member interest rate discount is offered on new student loan refinance applications from active EMRA members. The EMRA discount is applied to your monthly payment and will be reflected in your billing statement. The discount will end if the EMRA notifies Laurel Road that the borrower is no longer a member. This offer cannot be combined with other member or employee discounts.

5. Checking your rate with Laurel Road only requires a soft credit pull, which will not affect your credit score. To proceed with an application, a hard credit pull will be required, which may affect your credit score.

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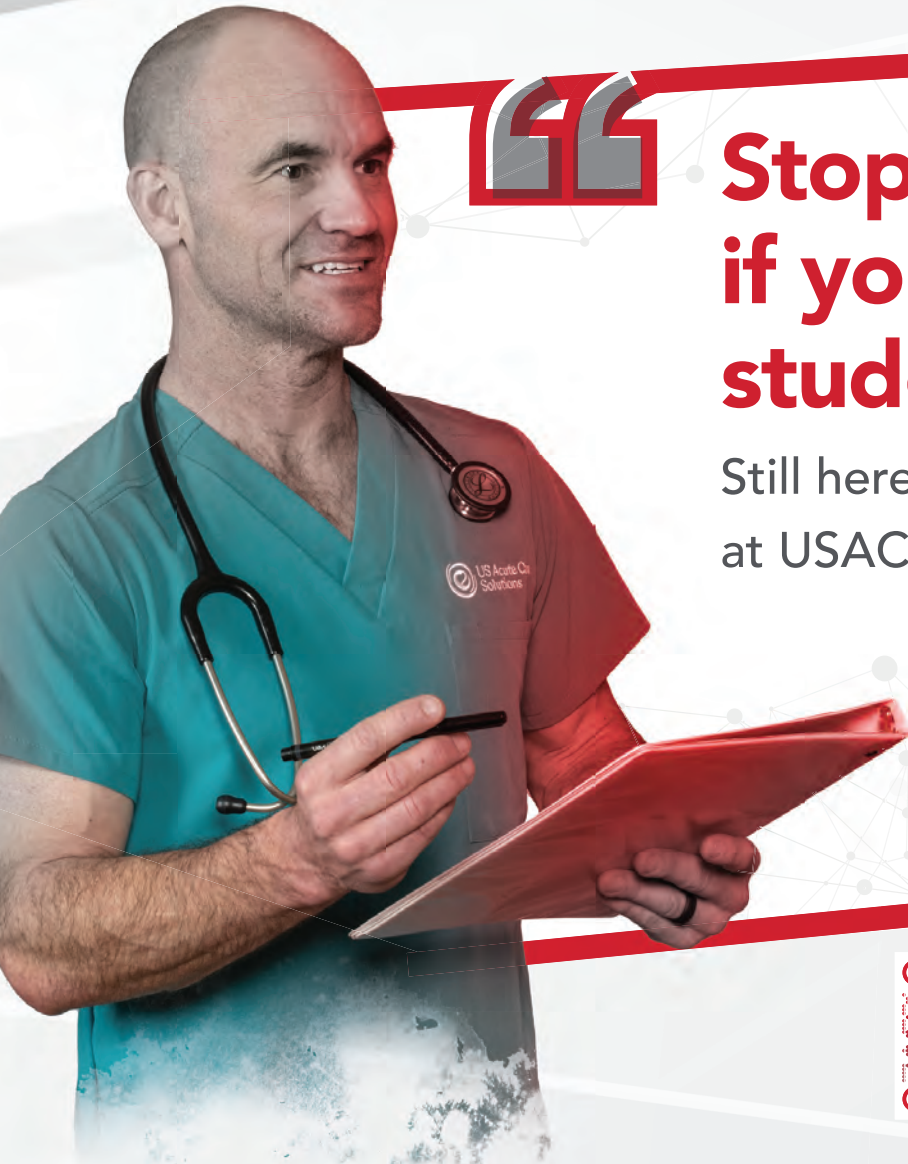
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