EM Resident
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Ketamine for Treatment of Acute Suicidality

ECMO...The Ultimate Antidote?

Effective Opioid Dosing for Opioid-Tolerant Patients

Thyroid Storm: A 'Grave' Condition

INK GONE WILD

A Focused Guide on Tattoo-Related Complications

Goals-of-Care and Code Status Conversations

Pediatric GI Bleed With Meckel's Diverticulum

The Dangers of Delta-8

laurel road FOR DOCTORS

Student Loan Forgiveness Consultation

Get ready for student loan payments with an expert guide.

The student loan payment pause and interest waiver have ended. Schedule a **free consultation** with our student loan specialists at GradFin[1] to get help navigating the different repayment and forgiveness options.

EMRA Member Benefit

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

EMRA

A GradFin student loan consultation will help you:

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

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

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

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

Schedule your free 30-min student loan consultation

laurelroad.com/EMRA

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

1. GradFin and Laurel Road are brands of KeyBank N.A.
2. EMRA members get a $50.00 discount on an annual program membership with GradFin ("Offer"). The discount will be applied on the current annual membership fee of $249.00 and will automatically apply at checkout. This Offer is only available to current EMRA members, is non-transferable and cannot be applied to previous membership purchase(s). This Offer cannot be redeemed for cash or combined with other offers and is subject to cancellation at any time and without notice.
3. To qualify for PSLF, you must be employed by a U.S. federal, state, local, or tribal government or not-for-profit organization (federal service includes U.S. military service); work full-time for that agency or organization; have Direct Loans (or consolidate other federal student loans into a Direct Loan); repay your loans under an income-driven repayment plan; and make 120 qualifying payments. For full program requirements, visit www.studentaid.gov/manage-loans/forgiveness-cancellation/public-service.

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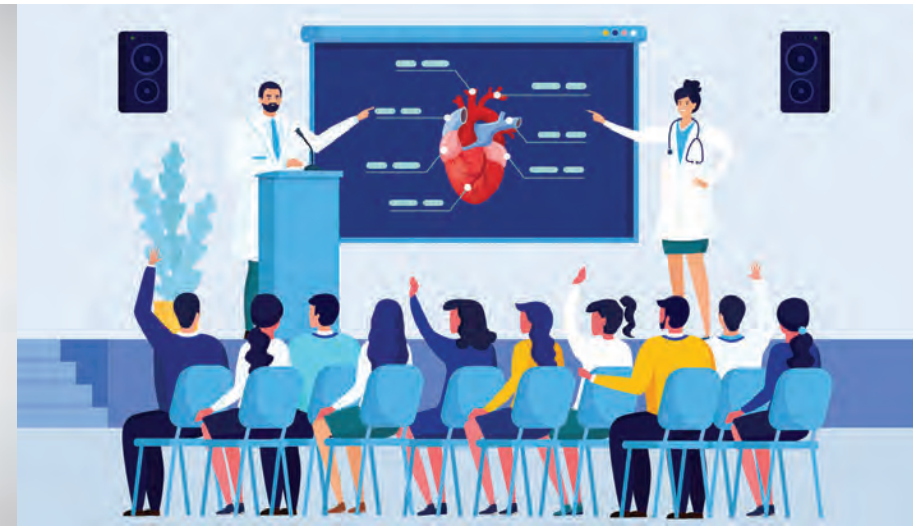

The Resident as Teacher

Why Other Trainees Look to Us to Learn

"I'm gonna be a teacher, just like Mom!"

I grew up in a classroom. Every August, I recall spending a couple of Saturdays hot-gluing posters to the wall, stapling decorations to the cork boards, and occasionally racing the office chairs down the hallway with my brother. We all pick up different things we don't realize we do from our parents. Even though I said I wanted to be just like my mom when I was little, I knew from a pretty young age that I wanted to be a doctor. It boggles my mind that it took me until my mid-20s to realize I still wanted to be a teacher and that these could, in fact, be the same job.

The Latin word for doctor, *docere*, means "to teach." Teaching is, without a doubt, a core part of being a physician. We teach our patients every day. We teach ourselves medicine often. And at some point during our training, we all become a teacher to other trainees.

I think the moment I truly became a teacher to other residents was during my second month of PGY-2, when I was a senior in the MICU. I felt vastly inadequate to be teaching the intern on my team anything about critical care medicine. I was just an intern myself a month ago. What qualifies me to teach other trainees? I read a lot of personal development books, and I kept coming back to this quote from Ed Mylett's *The Power of One More*:

"YOU ARE MOST QUALIFIED TO HELP THE PERSON YOU ONCE WERE."

While there is a myriad of advice on how to transition to being a first-year resident, there is little advice on how to become an upper level, despite the transition to second year being often touted as the most difficult. Many of us may be in this same mindset I was earlier this year at one point or another. Even though it may not feel like it at the time, we may actually be the best choice in some moments to teach other trainees. Though I've certainly learned a significant amount from my attendings, I've learned a lot about medicine from watching and from the advice of my upper-level residents.

As fellow residents, we have a unique relationship with one another. This role as resident and teacher is a responsibility, but it is also an opportunity. We can cultivate a learning environment for each other that is one we would have benefitted from. We are close enough to the role to understand the best ways to learn and the most helpful feedback that can lead to success. Feedback and advice are often more freely and openly accepted.

Morgan Sweere MD, MPH
Editor-in-Chief, EM Resident
University of Florida – Jacksonville

When you think about your role, wherever you are in your training, I would urge you to think of yourself as a teacher as much as you do as that of a lifelong learner. At its core, that is one of the main goals of *EM Resident*: to give residents an opportunity to enter that role and share their insights. We've all had great teachers throughout our lives who have helped us get to this point. Now, it's time to be one. ✶

Morgan Sweere, MD, MPH
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References available online.

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Optimism vs. Realism — Let's Call it a Tie

EM Needs Both to Navigate Current Climate

Blake Denley, MD
EMRA President
@BlakeDenleyMD

How do you respond to adversity? Do you like to keep your head down and act like nothing is happening? Or do you prefer to activate your "fight or flight" response and run in the opposite direction? Or maybe you like to face it head on. And how do we, the specialty of emergency medicine, respond when faced with adversity? How should we?

Emergency medicine has had, and continues to have, plenty of adversity necessitating response: Last year's unprecedented Match. Increased disruption of the physician-patient relationship. Workforce studies. "Leading" burnout rates. Growing prevalence of private equity in our EDs and residency programs. The COVID-19 pandemic. Boarding crisis. Unfortunately, I could go on and on…

So how do I think emergency medicine should respond to adversity? By applying the Stockdale Paradox.

STOCKDALE PARADOX, EXPLAINED

Admiral James Stockdale was a U.S. Navy officer who, after his jet was shot down during the Vietnam War, endured more than 7 years as a prisoner of war. Not only did he survive torture and solitary confinement, but he continued to serve the United States by being a leader among other POWs. During an interview with author Jim Collins, when asked how he survived when he didn't know the ending, Adm. Stockdale replied: "I never lost faith in the end of the story. I never doubted not only that I would get out, but also that I would prevail in the end and turn the experience into the defining event of my life, which, in retrospect, I would not trade."

Adm. Stockdale's willingness to remain hopeful and optimistic through significant adversity — while also confronting reality — encapsulates what is now referred to as the Stockdale Paradox. I believe our EM community should commit to adopting its principles.

APPLYING THE PARADOX TO EM

There are two components of the Stockdale Paradox — optimism and realism — that exist in a steady state as an inseparable dyad. A person or group must be careful not to ignore one component at any point. Both are present every step of the way.

All levels of concern and alarm-raising exist among varying narratives regarding the current state of EM. As with most things, reality likely lives somewhere between the loudest voices.

No matter where you perceive EM to be, I encourage you to commit to the application of the Stockdale Paradox as our specialty faces tough times. How we push forward matters.

As the voice of emergency medicine physicians-in-training and the future of our specialty, EMRA will continue to believe that the future of EM is bright while remaining committed to facing reality and addressing our headwinds. I invite you all to join us in this approach. ✶

References available online.

SPOTLIGHT ON:
Newly Elected EMRA Board Members
Fall 2023

EMRA is pleased to welcome the newest members to the EMRA Board of Directors: Blake Denley, MD, president; David Wilson, MD, president-elect; Jacob Altholz, MD, vice speaker of the council; Joe-Ann Moser, MD, MS, director of education; and Morgan Sweere, MD, secretary/editor.

Blake R. Denley, MD

Ochsner Health | New Orleans, La.
President

WHAT'S YOUR FIRST PRIORITY AS EMRA PRESIDENT?
There are so many projects we're working on, but at the end of the day, our members are always my first priority. This plays out in a few ways, but I'll highlight two — our opportunities for involvement and our on-shift clinical guides.

A strength of EMRA lies in its ability to help trainees get where they want to go in their career. We have some amazing leadership and advocacy opportunities, and I encourage everyone to get involved with at least one thing.

We're also continually working to ensure our members feel well-equipped for their shifts, so we regularly update our existing clinical guides and introduce new ones. We work hard to know what our members currently need and what they'll need in the coming years. For example, this past year we released the Nerve Blocks and Procedural Pain Management Guide.

HOW CAN EMRA MEMBERS MAKE A DIFFERENCE?
Get involved and contribute to a project. We have so many avenues for involvement, and your contributions will not only help EMRA, but I also believe they will help you as an individual feel more fulfilled on a personal level.

HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?
Well, I rejoined a class-based gym a few months ago and have been enjoying it! I'd say it really helps reset my brain after a draining shift. If not the gym, then I revert to napping, which is quite the opposite from the gym but still pretty effective for me.

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!

WHAT'S 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!

WHAT'S ONE SKILL YOU COULD DO WITHOUT?
I'm really good at eating desserts.

FAVORITE FOLLOW ON SOCIAL?
All of the local plant shops in New Orleans.

References available online.

SPOTLIGHT ON: Board Members

David Wilson, MD

University of Cincinnati
President-Elect

WHAT ARE THE MOST PRESSING ISSUES FACING EM?
Emergency medicine has several issues, and 10 emergency physicians would give 10 different issues. I like to be solution-oriented, and I believe that many problems facing our specialty can be improved by expanding what we can do for our patients.

HOW CAN EMRA MEMBERS MAKE A DIFFERENCE?
I love EMRA because it gives residents a voice to make a difference in the future of the specialty. You can join our committees to find folks with similar interests and work toward advancing our specialty in your niche. You can also get involved in advocacy and legislation through the Representative Council, Health Policy Academy, and others to bring solutions and have EMRA work for you to make our future (and our now) brighter.

HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?
After a tough shift, you'll find me grabbing some fresh air. I love spending time in some green space to recharge, but I've also been known to frequent 11pm post-shift sushi as well as post-shift breakfast.

WHAT IS SOMETHING PEOPLE DON'T KNOW ABOUT YOU?
My favorite holiday is Groundhog Day.

WHAT'S ONE SKILL YOU WANT BUT DON'T HAVE (YET)?
I'm getting close, but I'm still working on making the perfect gnocchi from scratch.

WHAT'S ONE SKILL YOU COULD DO WITHOUT?
I consider myself a champion parallel parker, but now that I live in the Midwest, I don't often find myself needing to parallel park. I used to consider it my mediocre superpower, but now it's a skill I just don't need much.

FAVORITE FOLLOW ON SOCIAL?
It's a toss-up between @emresidents and @tamingtheSRU.

References available online.

SPOTLIGHT ON: Board Members

Jacob Altholz, MD

University of Nevada | Las Vegas
Vice Speaker of the Council

WHAT'S YOUR FIRST PRIORITY AS AN EMRA BOARD MEMBER?
Making sure the voice of EMRA members is heard, understood, and appreciated

WHAT IS THE BEST ADVICE YOU'VE EVER RECEIVED?
At the end of the day, the only person who has to be okay with your decisions is yourself.

HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?
Work out, make myself dinner (or buy a pizza), and pass out early

WHAT IS SOMETHING PEOPLE DON'T KNOW ABOUT YOU?
I am classically-training as a singer. I started taking voice lessons once a week in medical school and haven't given up yet!

WHAT'S ONE SKILL YOU WANT BUT DON'T HAVE (YET)?
Speak another language fluently

WHAT'S ONE SKILL YOU COULD DO WITHOUT?
Reciting 26 digits of pi. I took one of those competitions in grade school too seriously and still lost.

DOES PINEAPPLE GO ON PIZZA?
Absolutely, especially with pepperoni

FAVORITE COMFORT FOOD (OR DRINK)?
Beef Stroganoff

Morgan Sweere, MD, MPH

University of Florida | Jacksonville
Secretary/Editor

WHAT'S YOUR FIRST PRIORITY AS AN EMRA BOARD MEMBER?
My first priority is to give as many opportunities as possible for EMRA members to get involved in publications — from their first publication to the many after that. I want to make sure residents know they have a chance to share if they want to and to inspire others to get their work out into the world.

WHAT IS THE BEST ADVICE YOU'VE EVER RECEIVED?
The best advice I have ever received is from my parents. They have always told me that I can't always start out being the best at everything, but I can be the one working the hardest at it. I think this has helped me develop a strong work ethic that can now serve my patients.

HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?
A walk with my dog, Lily, and a bubble bath!

WHAT IS SOMETHING PEOPLE DON'T KNOW ABOUT YOU?
Ask to race me, and you'll find out!

WHAT'S ONE SKILL YOU WANT BUT DON'T HAVE (YET)?
I want to learn how to fly a plane.

WHAT'S ONE SKILL YOU COULD DO WITHOUT?
Fence repair — my pup is an escape artist!

DOES PINEAPPLE GO ON PIZZA?
No

FAVORITE COMFORT FOOD (OR DRINK)?
Pepsi and Reese's

References available online.

SPOTLIGHT ON: Board Members

Joe-Ann Moser, MD, MS

University of Wisconsin | Madison
Director of Education

WHAT'S YOUR FIRST PRIORITY AS AN EMRA BOARD MEMBER?
Having trained at an urban academic program and chosen to do a medical education fellowship, I realize I'm coming to the role of director of education from a very specific viewpoint. So I want to spend some time at the beginning of my term listening to residents and med students from different programs and parts of the country about what more they think EMRA can be doing to improve their education. If you have any ideas, please feel free to email them to me at educationdir@emra.org.

WHAT IS THE BEST ADVICE YOU'VE EVER RECEIVED?
Perfect is the enemy of good. I just googled this again (to make sure I was getting it right) and turns out it's a Voltaire quote. I still struggle with this. But there aren't enough hours in a day to spend time perfecting every little thing, so for our own sanity, we have to figure out which ones to focus on.

HOW DO YOU RECHARGE AFTER A TOUGH SHIFT?
I love to lie on my couch and read a good book. After a tough shift, preferably something fiction to take my mind to a different place. I recently read "Black Cake" by Charmaine Wilkerson and highly recommend it!

WHAT IS SOMETHING PEOPLE DON'T KNOW ABOUT YOU?
I actually applied to medical school twice. The first time was during my senior year of undergrad, and halfway through the interview process, I realized I wasn't ready to go straight through, so I withdrew my applications. I spent my gap year doing research at the NIH and learning how to "adult." I was a lot happier when I applied the next year, even though it was scary in the moment to defy what was expected of me to prioritize my wellness.

WHAT'S ONE SKILL YOU WANT BUT DON'T HAVE (YET)?
I'd really like to learn some computer programming. I realize this might be a stretch because I oftentimes joke I'm secretly 85 years old and struggle to turn my laptop on each morning. But I find the concept of using a logical sequence of commands to instruct a computer to solve a problem fascinating.

WHAT'S ONE SKILL YOU COULD DO WITHOUT?
I fully recognize this is not a skill, but I could do without my finger joints being hypermobile (aka double-jointed). Sometimes they lock in place when I'm typing.

DOES PINEAPPLE GO ON PIZZA?
Absolutely not!

FAVORITE COMFORT FOOD (OR DRINK)?
Dark chocolate

References available online.

SPOTLIGHT ON:
Health Policy Academy Fellows

The EMRA and ACEP Health Policy Academy is a highly selective, year-long program that trains you to become a policy advocate in emergency medicine. It's designed to give passionate residents like you the opportunity to impact policy within EM 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: Jordan Vaughn, MD; Jose Reyes, MD; Micaela LaRose, MD; and Shane Solger, MD!

Jordan Vaughn, MD

Health Policy Academy Fellow
LSU Spirit of Charity

Dr. Vaughn is from Seattle but now considers herself a New Orleans transplant as a result of being a military brat. She graduated medical school from The University of Rochester Medical and Dental School in Rochester, NY. She has a special interest in domestic and global health equity with a focus on DEI initiatives, violence injury and prevention, and community engagement. As chief resident, she was in charge of recruitment, overseeing social EM curriculum, scheduling, facilitating professional development, and other administrative duties. Dr. Vaughn is now a clinical assistant professor of medicine, associate director of social EM, and associate director of DEI at Louisiana State University and public health clinical director for the City of New Orleans Health Department. When she is not working, Dr. Vaughn loves to travel and spend time with her husband, daughter, and extended family in Louisiana.

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

DR. VAUGHN: As a Health Policy Academy Fellow, I have been fortunate to meet and learn from so many individuals who have dedicated their careers to advocacy. To be able to learn about the process of policymaking, and then apply those skills at ACEP Council and Representative Council, have been invaluable. I look forward to applying the skills learned this past year to continue to educate medical trainees and faculty.

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

DR. VAUGHN: Whether you have had no experience and are interested in policy or have experience and are looking to expand that knowledge, HPA is for you. I have learned so much from my co-fellows who brought different experiences and perspectives to our cohort this year. Our Health Policy Academy directors, guest speakers, and EMRA board were so supportive and truly wanted us to succeed at every step this past year. Advocating for students and residents at EMRA and ACEP through lobbying, creating, and passing policy that impacts our entire specialty is life changing, and I recommend that any resident who would like to gain more involvement in this field apply for the Academy. I've been able to strengthen existing skills and have learned skills that I plan to apply in my advocacy career.

EMRA: 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?)

DR. VAUGHN: My passions and focus in advocacy surround health equity and social emergency medicine related policy including MAT, access to care, and violence prevention. Furthermore, I will remain involved in advocating for the specialty of emergency medicine to ensure the future generations of attendings, trainees, and patients are protected and taken care of. It is important that as a specialty we continue to advocate for not only ourselves but our patients.

References available online.

SPOTLIGHT ON: HPA Fellows

Jose Reyes, MD

Health Policy Academy Fellow
Cook County Health

Dr. Reyes' professional goals were shaped by his life as a first-generation Mexican-American in a majority-minority border town rife with disparities. His professional goals include improving the care of marginalized groups through research that can be used to craft and implement new programs or policies at the state and local levels. Dr. Reyes believes that through the combined efforts of research, community organizing, and government policy, change is possible.

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

DR. REYES: Over the year, I learned so much about being a leader in organized medicine. This fellowship will give you the skills to develop effective and realistic policy resolutions, will promote your public speaking ability, and will give you the opportunity to speak up on items you care about, developing skillfulness in how you promote your perspective in a collaborative manner. This fellowship will not only give you concrete experience in drafting and promoting policy, but it will also build your potential as a leader.

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

DR. REYES: You should apply to the Health Policy Academy if you want to be a future leader in policy and organized medicine. Even if you have experience in AMA or other organizations, you will be involved in every step of the policy process, from drafting policy, to evaluating policy, to drafting committee reports, to voting on the floor of ACEP Council. You will learn in this one year a strong foundation to be a voice in EM people want to hear and will always respect.

EMRA: 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?)

DR. REYES: In residency, I have been interested in promoting and bettering women's health. At LAC and ACEP Council, I was exposed to a broader range of areas that require aggressive and constant advocacy. My initial interests coming to the HPA were related to care for survivors of sexual violence, but this has been expanded further to broadening our management of early pregnancy loss, protecting EM physicians in their care of patients experiencing pregnancy loss spontaneous or otherwise, and improving education for EM residents in matters related to women's health.

References available online.

SPOTLIGHT ON: HPA Fellows

Micaela LaRose, MD

Health Policy Academy Fellow
San Antonio United Health Services Education Symposium

Dr. LaRose is a second-year resident and active-duty Air Force at San Antonio Military Medical Center. She is originally from Minnesota and attended Carleton College, where she studied political science. She worked for two years as a research analyst at OpenSky Policy Institute, a revenue, education, and health-finance think tank before attending Duke University for medical school.

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

DR. LAROSE: My year as an HPA fellow was filled with experiences that greatly prepared me to embark on a career as an emergency medicine advocate. While I had experience in some areas of health policy, the monthly meetings were designed to provide us with more complete foundational knowledge. This included exploring the complex web of stakeholders involved in the health policy creation process, including federal, state, and local governments; hospital organizations; insurance agencies; and medical professional organizations. We explored important issues affecting emergency medicine such as Medicare reimbursement and changes to billing/coding. We received lectures from emergency physicians actively working in health policy arenas and the tangible impact their efforts have produced.

While this foundational understanding of health policy was impactful, the training we were provided in how best to produce change was even more valuable. During the year, we were also trained in how to advocate, including how to write policy resolutions and provide written and verbal testimony. In addition to the monthly curriculum, we also attended national conferences such as CORD and ACEP where we could put these skills into practice. We helped write and advocate for various policies being discussed and gained an understanding/appreciation of other soft skills involved in policy development: finding partnerships with other key stakeholders, compromising with opponents, and making sure to identify your policy priorities. Meeting other advocates within emergency medicine while at these conferences also provided further opportunity to stay involved once our time as HPA fellows has ended.

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

DR. LAROSE: Every resident interested in advocacy and health policy as part of their emergency medicine career should apply! Beyond gaining knowledge of relevant issues and practice with advocacy skills, the number one reason people should want to be an HPA fellow is the community that you will gain through your participation during the year. Working within EMRA, you will connect with motivated, engaged residents who are equally excited to make a difference in our field. Additionally, by attending conferences throughout the year, you will interact with physicians who have helped to actively shape policy in emergency medicine for as many as 50 years.

Emergency medicine is a difficult career, and we are all aware of the statistics on burnout in our field. Through this experience, I was able to see physicians of all ages and career stages actively working to make our specialty the best it can be. Instead of remaining frustrated, inert, and experiencing further and further job dissatisfaction, these providers have come together year after year to push for change. Through their efforts, there have been major wins, including prevention of cuts to Medicare reimbursement and more streamlined billing/documentation requirements. Connecting with these passionate emergency medicine providers during my time as an HPA fellow has me excited to not only begin a career as an EM physician but also face its challenges head-on with support from this EM advocacy community.

EMRA: 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?)

DR. LAROSE: While my continued advocacy interest will likely reflect the wide-ranging health policy issues affecting emergency medicine given our mandate to care for patients from all walks of life, one issue in which I will continue to be deeply involved is women's health. Our ability to care for our biologically female patients is under threat. As our ability to provide medically indicated and timely care continues to be legislatively restricted, we can expect to see an increase in patients with severe life-threatening hemorrhage and infection. And as we see our OB colleagues leave more restrictive states, the care of those unable to access obstetric care in these areas will fall to us. Therefore, it is important to push for policy that not only halts and hopefully reverses these assaults on our practice of medicine, but also promotes preparation of the emergency medicine workforce to competently meet the challenge ahead.

Additionally, with previous experience in government finance research, I feel an invested interest in Medicare/Medicaid policy. As emergency medicine providers, we need to ensure that our reimbursement is fair to keep our doors open. Moreover, working for better coverage for our patients will get them the preventative care they need so they can avoid coming through our doors in avoidable extremis.

References available online.

SPOTLIGHT ON: HPA Fellows

Shane Solger, MD

Health Policy Academy Fellow
Kings County/SUNY Downstate EM/IM Combined Residency

Shane Solger is a resident at Kings County/SUNY Downstate's combined emergency medicine/internal medicine program. He is originally from Skokie, Ill. After graduating from New York Medical College, he completed a transitional year at the Naval Medical Center San Diego. He currently acts as a Committee of Interns and Residents Delegate representative and member of the Committee on Political Education. Dr. Solger's interests include voting justice, language justice, and advocating for an end to out-of-title work for residents.

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

DR. SOLGER: My time as a Health Policy Academy Fellow has been an amazing experience, and it has provided an immersive experience into the world of organized emergency medicine.

I found that participation in the resolution review process on the EMRA Reference Committee was one of the more important and fruitful parts of the Academy, and it illustrated how the membership can impact how these institutions advocate for or invest in different initiatives. Through the process of reading and critiquing resolutions through EMRA and ACEP, I was able to author and help push forward several resolutions through the Committee of Interns and Residents (CIR), EMRA, and the New York Chapter of the American College of Physicians regarding language justice and institutional protections for pregnant residents and new parents.

The Academy also put on display how these large groups advocate for us. As we collectively suffer as a specialty with issues like violence in the workplace, difficulty with boarding patients, and poor reimbursement rates, it was reassuring to see elected officials coming to speak at ACEP's Leadership and Advocacy Conference on our behalf as a direct result of the actions of ACEP's leaders.

Before I participated in the Health Policy Academy, I was also relatively agnostic concerning my feelings surrounding membership in ACEP after residency, and now, after seeing how much the group moves to support EM physicians in all forms of clinical practice, I know that I would be doing a disservice to myself and my colleagues if I did not continue to support them through membership.

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

DR. SOLGER: The Health Policy Academy is invaluable for any resident who is interested in administration, social emergency medicine, health policy, and/or organized medicine. As we transition in our careers from residents to attendings, we must know how to advocate for ourselves and our patients, and through whom we can do it. The Health Policy Academy provided the opportunity to get close to the staff and leadership of EMRA and ACEP, and it provided numerous networking opportunities. I think that if you have a passion within the field of emergency medicine and you are looking to navigate the process of how to garner support from within these large and influential organizations, then the Health Policy Academy will provide a glimpse into both the strengths and the limitations of these organizations to help you achieve those goals.

EMRA:
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?)

DR. SOLGER: I don't think I have any new policy or advocacy goals as a direct result of the Health Policy Academy; however, I think time at the Health Policy Academy has helped to improve my ability to better advocate for the issues I have already been working on. For the last year, I have been working to improve interpretation services at my home institution in Kings County. The time I spent on the reference committee allowed me to turn those efforts into an authorship of an EMRA Policy through the October 2023 adoption of my resolution "Language Justice and Health Equity in the Emergency Department," and a similar resolution is currently being addressed through the New York Chapter of the American College of Physicians for consideration.

Regarding future advocacy goals, in my role as a CIR Regional Vice President, anything that affects my local membership has the potential to become a new advocacy goal, and I think that the Health Policy Academy has provided me with excellent tools to address whatever comes up.

References available online.

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Anti-N-Methyl-D-Aspartate Receptor Encephalitis During Pregnancy

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ABSTRACT

Anti-N-methyl-D-aspartate receptor encephalitis (ANMDARE) is a type of autoimmune encephalitis that preferentially affects young women of reproductive age and is strongly associated with viral infections and ovarian teratomas.

Here, we present a case of a 20-year-old patient with autoimmune encephalitis in the setting of an ovarian teratoma, complicated by pregnancy.

The patient, with no significant past medical history, was brought in by her parents due to acute onset of significant behavioral changes. Initial workup revealed a positive live intrauterine pregnancy of 14 weeks and a right 2.5 cm ovarian cyst. After consulting with psychiatry, the patient was placed on an involuntary behavioral health hold but became too agitated to be transferred safely to an inpatient psychiatric unit. Ultimately, she was admitted to inpatient service for acute psychosis with concern for an organic etiology. Further investigation of the patient's cerebrospinal fluid revealed pleocytosis and NMDAR antibodies. Obstetrics was consulted for possible ovarian teratoma as a source of the NMDAR antibodies. After consultation with the patient's parents and the ethics board, a right salpingo-oophorectomy and medical termination of pregnancy was performed uneventfully. Pathology results confirmed a cystic teratoma. The patient's symptoms gradually improved, and the patient was eventually

References available online.

discharged home.

Emergency physicians must maintain a high index of suspicion for ANMDARE when evaluating young female patients with an acute onset of neuropsychiatric symptoms. It is our duty as emergency physicians to rule out organic etiologies of psychiatric presentations. Screening should be done to investigate potential sources of ectopic antibody production, including ovarian teratomas. Pregnancy warrants a detailed conversation with the patient or guardian and a medical ethics board to ensure the safety of the patient and fetus. Early treatment is associated with good patient outcomes.

INTRODUCTION

Autoimmune encephalitis, also known as antibody-mediated encephalitides, is a collection of neurological disorders, first described in 2007, caused by antibodies attacking self-antigens in a patient's central nervous system (CNS).[1,2] The most common type of autoimmune encephalitis is ANMDARE, which preferentially affects children and young women and is strongly associated with viral infection and ovarian teratomas.[3] Mortality rates are estimated between 8% and 10%.[2] In patients presenting with neuropsychiatric symptoms refractory to typical antipsychotics or multi-regimen therapies, as well as those with abnormal vital signs, an organic etiology must be considered in the differential before placing a psychiatric diagnosis on the patient.

CASE DESCRIPTION

A 20-year-old female with no significant past medical history was brought into the ED by her parents for various behavioral changes. Per the patient's mother, her behavioral changes included auditory and visual hallucinations, and seeing and conversing with deceased family members. The patient was sexually inappropriate with other family members and her pets. She also threatened to kill herself in multiple ways. Notably, she was unable to interact with others in a meaningful way, making bizarre statements such as "you're trying to eat me," and could not answer questions coherently. These symptoms were ongoing for a few weeks leading up to ED presentation, with no precipitating triggers. There was no known psychiatric history in the family. No illicit drug abuse was noted. The patient was previously evaluated by two outside facilities prior to this ED visit. Those evaluations included unremarkable laboratory studies and a computerized tomography (CT) scan of the head without contrast; the patient was discharged home with outpatient follow-up after she denied symptoms.

Upon initial diagnostic evaluation, the complete blood count and chemistry panel were unremarkable. The patient's urine drug screen was negative for any tested substances. Thyroid stimulating hormone was within normal limits. However, her serum qualitative human Chorionic Gonadotropin (hCG) came back positive, prompting further investigation. Quantitative hCG was at 111,358 mIU/mL. As a result, an obstetric ultrasound was obtained, which revealed a single live intrauterine pregnancy with a sonographic date of 14 weeks. There was also a right-sided 2.5 cm ovarian cyst with a solid mural component at the base.

Psychiatry was consulted given her symptoms and requested further investigation for medical causes due to acute onset and her young age. Neurology was then consulted and felt that the patient's symptoms were more psychiatric in etiology, given the absence of any focal neurological findings and seizures. However, neurology also stated that the patient's case could warrant further neurologic work-up if she did not improve. As a result, psychiatry then placed the patient on an involuntary behavioral health hold for acute psychosis causing danger to herself and grave disability. The patient, while awaiting placement over the next two days, became increasingly agitated, verbally abusing and spitting at staff, unable to answer questions appropriately, and requiring intermittent sedatives and restraints. This escalated to scheduled benzodiazepines, but the patient still had no improvement and therefore could not be transferred to an inpatient psychiatric facility due to worsening rhabdomyolysis from fighting the restraints. Vital signs fluctuated throughout her ED stay, with intermittent tachycardia and hypertension. Ultimately, the patient was admitted to the internal medicine service for further work-up.

The patient's antinuclear antibodies (ANA) panel, syphilis, human

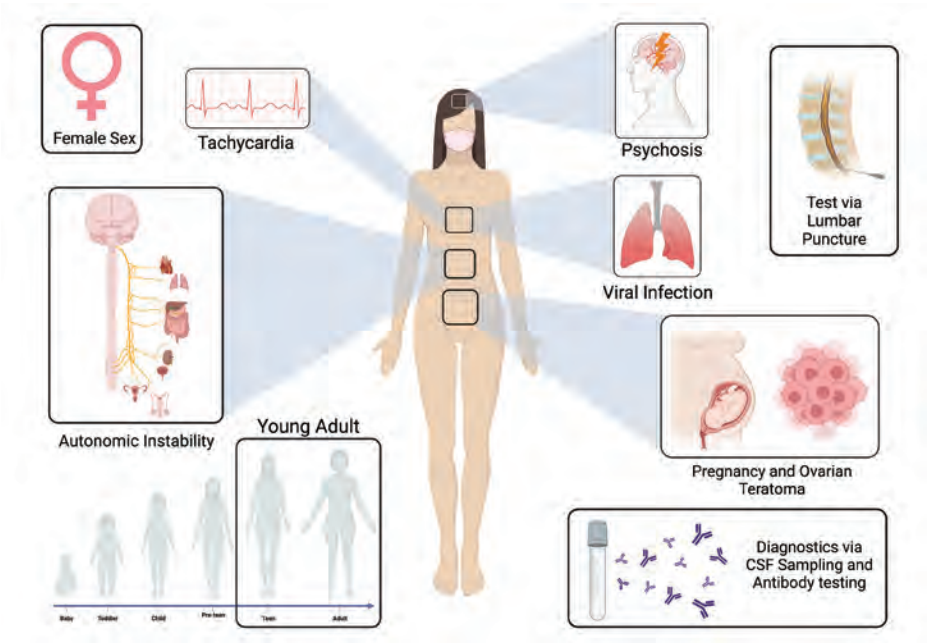
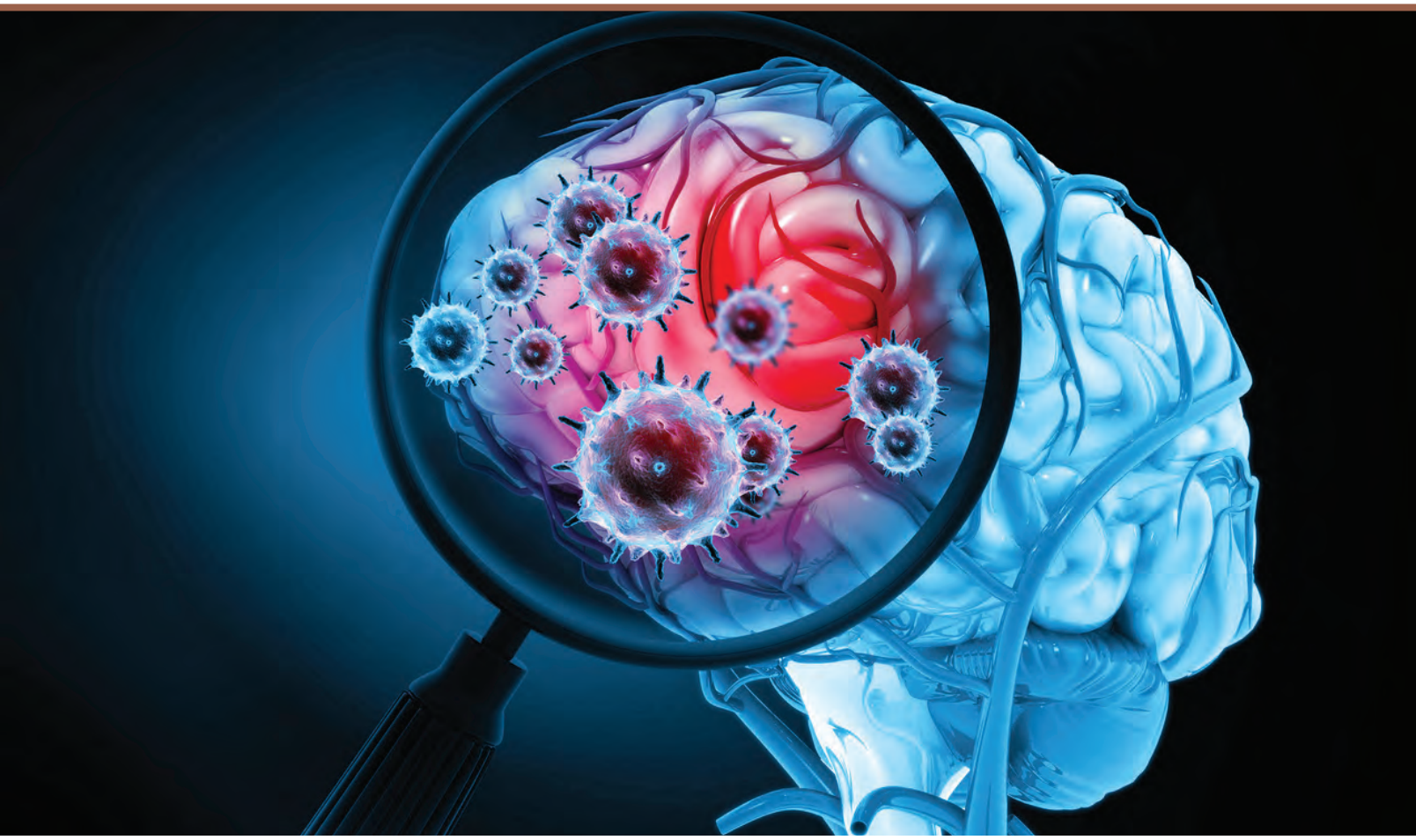


FIGURE 1

References available online.



immunodeficiency virus (HIV), hepatitis panel, ceruloplasmin, methylmalonic acid, and iron studies were negative. Magnetic resonance imaging (MRI) of the brain and cervical/thoracic/lumbar spine were negative for any acute abnormalities. The meningitis panel was negative for any infectious culprit. However, cerebrospinal fluid studies were significant for pleocytosis concerning for an inflammatory process. Cultures had negative growth for 72 hours. Neurology was re-consulted due to this abnormal finding that could be due to autoimmune encephalitis versus paraneoplastic syndrome and agreed to transfer the patient to their service.

Several days later, specialized send-out tests of the patient's cerebrospinal fluid came back positive for N-methyl-d-aspartate receptor (NMDAR) antibodies. She was started on five days of intravenous immunoglobulin with methylprednisolone and one day of rituximab. MRIs of the abdomen and pelvis were ordered to evaluate for any known tumors to be attributed to her NMDAR antibodies. However, they only re-demonstrated the known right ovarian cyst. CT of the chest with contrast revealed no lesions or tumors as well. With no clear source and failure to improve on medical management, obstetrics was consulted to evaluate the ovarian cyst for a possible teratoma, as the first ultrasound read it as having a solid mural component at the base. After a meeting with the patient's parents and the ethics committee, a decision was made to proceed with a right salpingo-oophorectomy and abortion for diagnostic and therapeutic purposes, as pregnancy was also known to precipitate or worsen autoimmune encephalitis. The patient had an uncomplicated operation, and the pathology results were positive for a cystic teratoma. Her encephalopathy gradually improved over the next several days, and she was discharged home.

ETIOLOGY AND PRESENTATION

The most common type of autoimmune encephalitis is ANMDARE, which is caused by antibodies against the NR1 subunit of the anti–N-methyl-d-aspartate (NMDA) receptor and most commonly affects women of reproductive age.[1,4,5] Up to 58% of all women with ANMDARE also have an underlying teratoma, with bilateral teratomas occurring in up to 15% of patients.[2,5] In addition to teratomas, both viral infections and herpes simplex encephalitis are known triggers of ANMDARE.[6]

Characterized by neuropsychiatric symptoms, ANMDARE most commonly presents with behavioral changes, seizures, and cognitive impairment.[1,2] Autonomic instability — such as excess salivation, hyperthermia, variations in blood pressure, tachycardia, and hypoventilation — is also commonly seen. Prior case studies have suggested that seizure patients with ANMDARE may be more susceptible to cardiac dysrhythmias as compared to patients presenting with seizures due to other etiologies.[4] One retrospective study of 100 patients found cardiac

References available online.

dysrhythmias to occur in up to one-third of patients.[7] Notably, the present case describes a patient who presented with primarily psychiatric symptoms without extra-psychiatric manifestations as described in prior case reports.[5,8]

The origin of the autoantibodies featured in ANMDARE is largely variable, with both pregnancy and ovarian teratomas being well-documented sources of immunogenic modulation and potential triggers of antigenic presentation of NMDA receptor subunits.[3,8] Without treatment, ANMDARE can be fatal. Therefore, early diagnosis through thorough history-taking and clinical workup is crucial in improving patient outcomes. Prompt excision of the ovarian tumor, or any ectopic source of autoantibodies, is associated with improved outcomes.[3]

CLINICAL DIAGNOSIS

In most cases, typical neurologic workup of neuropsychiatric symptoms includes magnetic resonance imaging, which is generally normal or shows only mild abnormalities in the setting of ANMDARE. A diagnosis of ANMDARE can be confirmed however, through careful examination of the cerebrospinal fluid (CSF) for evidence of autoantibodies against the GluN1 subunit of the NMDA receptor, lymphocytic pleocytosis, and levels of proteases and anti-proteases.[1,2,9]

Astute physicians may arrive at the correct diagnosis, as demonstrated in the case by Ito et al where — despite only mildly elevated CRP levels and CSF pleocytosis, negative abdominal ultrasound examination and MRI showing no ovarian teratoma — physicians diagnosed a case of ANMDARE in a 19-year-old pregnant patient.[8] Another case report by Reisz et al describes a unique instance of a 31-year-old pregnant patient with severe hypokalemia as a manifestation of ANMDARE.[10] In our case, a strong index of suspicion with the patient's inability to improve on psychiatric medications and overall unremarkable blood work worked in tandem to point toward testing for anti-NMDAR antibodies.

TREATMENT AND OUTCOMES

Treatment of ANMDARE surrounds immunomodulation using glucocorticoids and intravenous immunoglobulins as first-line therapy, with rituximab and cyclophosphamide reserved for treatment in refractory cases.[1,2] Symptomatic treatment of associated clinical symptoms is also indicated, including phenobarbital or phenytoin for seizures.

Factors that indicate poor prognosis include ICU admission, treatment delay >4 weeks, lack of clinical improvement within 4 weeks, and an abnormal MRI.[11] Mortality rates range from 8% to 10%.[2] Most patients have favorable long-term outcomes but still warrant follow-ups periodically to assess for recurrence, with 12% to 24% of patients experiencing them within the first 24 months.[12]

A study by Patel et al. investigated the cardiac manifestations of ANMDARE, specifically those resulting from ANMDARE-induced sinus node dysfunction such as sinus arrest, sinus bradycardia, and inappropriate sinus tachycardia.[5]

ANMDARE IN PREGNANCY

A retrospective study and literature review by Joubert et al analyzed the associations between ANMDARE and pregnancy and found that ANMDARE in the setting of pregnancy is associated with high rates of obstetric complications.[11] Investigating 27 cases, Joubert et al reported medical termination of two pregnancies, spontaneous miscarriage in two pregnancies, maternal death prior to delivery in one case, and uneventful delivery in 22 cases.[13] An ovarian teratoma was found and removed in four patients. It is postulated that transplacental transfer of NMDAR antibodies during gestation can result in neurologic deficits in the newborn.[13] Due to our patient's severe psychosis, a decision was made with the patient's parents and the ethics committee to terminate the pregnancy due to concerns about its role in worsening the patient's encephalitis.[14]

CONCLUSION

This case report highlights the importance of a multidisciplinary approach in the emergent care of ANMDARE, with consideration from neurology, psychology, and obstetrics. Emergency physicians must maintain a high index of suspicion for ANMDARE when evaluating young female patients with an acute onset of neuropsychiatric symptoms and worsening conditions despite antipsychotic medications and interventions. Screening should be done to investigate potential sources of ectopic antibody production, including ovarian teratomas. Pregnancy warrants a detailed conversation with the patient and/or guardian and a medical ethics board to ensure the safety of the patient and fetus. Early treatment is associated with good outcomes. ✶

TAKE-HOME POINTS

- Clinicians should maintain a high degree of suspicion for anti-NMDA receptor encephalitis (ANMDARE) and ovarian teratomas in young female patients presenting acutely with psychiatric symptoms, autonomic manifestations, and worsening conditions despite antipsychotic medications and interventions.
- Early diagnosis is critical in improving patient outcomes in pregnancy-associated ANMDARE.
- A multidisciplinary approach is crucial in the appropriate, comprehensive management of ANMDARE.

References available online.

Case Report: Ketamine for Treatment of Acute Suicidality

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ABSTRACT

Depression and suicide have large health and economic impacts on our society — yet we lack acute treatment options and prevention methods.

We describe a case of depression and acute suicidality in a 27-year-old female patient who received larger subanesthetic doses of ketamine than prior studies. She was followed in an outpatient ketamine clinic with repeat infusions every two days for six total treatments and noted to have marked improvement and resolution of her acute suicidality.

Larger subanesthetic doses of ketamine may have greater efficacy in treating acute suicidality. Further studies should be conducted to better understand the dose-dependent impacts of ketamine on acute suicidality and depression while balancing the potential complications of its use.

INTRODUCTION

Suicide was the 12th leading cause of death in the United States in 2020, claiming the lives of 45,979 individuals.[1] In 2020, at least 15.2 million adolescents and adults thought about committing suicide, 4.5 million made a suicide plan,

References available online.

and 1.8 million attempted suicide.[2]

Many suicidal ideation and attempted suicide cases are seen in the emergency department. In 2017, these cases accounted for more than 1.48 million visits, or approximately 1.1% of the 132 million total ED visits that year.[3]

In 2019, the large number of suicides and suicide attempts resulted in more than $12.8 billion in medical costs alone and more than $489 billion in composite medical costs, work loss costs, value of statistical life, and quality of life costs.[4]

Interventions and medications such as electroconvulsive therapy (ECT) and selective serotonin reuptake inhibitors (SSRIs) can treat depression and subsequent suicidal ideation, but these treatment therapies either require general anesthesia and extensive monitoring or take weeks to months to have significant clinical improvement and, therefore, are of minimal value in the ED.[5,6]

As of this publication, there is no standardized treatment for acute suicidality. Given the large health and economic impact suicide has on our society, we must prioritize finding more acute interventions for depression and suicidality. Multiple smaller trials for potential interventions for acute suicidality have been in the literature recently, but there has not been a large enough study with defined treatment protocols.

Here, we present a case of subanesthetic ketamine infusion as treatment for acute suicidality in a patient with a history of depression.

CASE REPORT

A 27-year-old female weighing 81 kg (179 lbs) with a history of postpartum depression and major depressive disorder presented to the ED with a one-day history of acute depressive symptoms with suicidal ideation. She first developed symptoms as part of postpartum depression after giving birth to a child approximately a year ago, and her symptoms persisted. She tried outpatient treatment with citalopram 40 mg daily at the onset of her postpartum depression, but discontinued treatment secondary to the therapy making her feel "obsessive." She also tried multiple other SSRIs, all of which were ineffective for various reasons. She subsequently presented to the ED for further evaluation and management because she felt the desire to harm herself with a defined plan of "driving a car into a pole."

The patient's ED evaluation was largely unremarkable except for her suicidal ideation with a defined method and plan for doing so. An order was placed for 100mg of ketamine to be infused over the course of an hour, approximately 1.23 mg/kg/hr. The patient was then observed for approximately an hour after the infusion and re-evaluated thereafter.

During the re-evaluation, the patient was found to be resting comfortably in no acute distress. She reported feeling significant symptomatic improvement and said that her suicidal ideation had resolved. The case was discussed with both the patient's personal psychiatrist and a ketamine provider prior to the patient's discharge, with definitive outpatient follow-up plans. She was subsequently discharged from the ED in stable condition.

Two days after the initial ED infusion, she was seen at a ketamine clinic every two days for five repeat infusions treatments over the course of 10 total days. Prior to each infusion, she was evaluated with Patient Health Questionnaire (PHQ-9) and Generalized Anxiety Disorder (GAD-7) surveys, self-reported measures for depression and generalized anxiety, respectively.

The PHQ-9 is a nine-item self-reported survey consistent of criteria for major depression rated on a four-point scale (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day) with a sensitivity of 77 percent and specificity of 85 percent for major depression when using a 10-point cutoff.[7]

The GAD-7 is a seven-item self-reported survey consistent of criteria for generalized anxiety rated on a four-point scale (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day) with a sensitivity of 83 percent and specificity of 84 percent for generalized anxiety disorder when using an eight-point cutoff.[8]

Ketamine infusions were titrated up from 90mg to 115mg of ketamine to be infused over the course of 45 minutes, approximately 1.48mg/kg/hr to 1.89mg/kg/hr. The patient was given ondansetron, metoclopramide, midazolam, and/or phenergan as pre-treatment antiemetics. Her vital signs were monitored and were stable throughout the entirety of each infusion treatment, and no adverse events were noted. During her 10-day treatment course, she was noted to have marked improvement in measures of depression and generalized anxiety, as seen in **Table 1**. After the fifth infusion, the patient was discharged with a prescription for 100mg ketamine lozenges to be taken once a night and instructions to return to the clinic for booster treatments as needed.

DISCUSSION

Ketamine is a N-methyl-D-aspartic acid (NMDA) glutamate receptor antagonist that has a proposed mechanism action of increasing synaptogenesis and elevating levels of brain-derived neurotrophic factor (BDNF), which has shown promise as a potential treatment of acute suicidality and depression.[9] However, recent studies have shown variable dose-dependent effects of ketamine on acute suicidality and depression in weakly powered trials.[10–14] Prior studies have primarily used subanesthetic doses of ketamine ranging from 0.2-0.5mg/kg, with lower doses being less likely

TABLE 1

Days after initial infusion	2	4	6	8	10
PHQ-9	24	3	2	1	2
GAD-7	16	6	3	3	4

Note: PHQ-9 = Patient Health Questionnaire; GAD-7 = Generalized Anxiety Disorder

References available online.

to show statistically significant impact on reducing depression and acute suicidality.[11,13-15] In studies that have shown significant impact, the effects take peak effect after approximately one hour and last from a few hours to a few days with diminishing effects after a few hours.[11,13-15]

While the potential positive impacts of ketamine are of interest in treating acute suicidality and depression, there are multiple contraindications to its use: underlying conditions in which elevated blood pressure may incur complications (e.g., aortic dissection, uncontrolled hypertension, myocardial infarction, and aneurysms); schizophrenia, as it may exacerbate the underlying condition; acute alcohol intoxication, as it may cause additive sedative effects; and pregnancy and breastfeeding, as its effects on fetuses and infants are not clearly elucidated at this time.[9]

Given the limited scale and number of studies looking at the use of ketamine infusion for acute suicidality and depression treatment thus far, there are several limitations for its use in the ED.

First, there has not been a sufficiently powered study that provides optimal dosing and alternatives to ketamine and, similar to other interventions, there is a possibility that patients will not respond to the infusion.10 Some studies suggest that this may be secondary to insufficient dosing and that patients may benefit from a higher-dose infusion.[12,14,15] While there are increased odds of encountering potential adverse effects when using higher doses of ketamine such as laryngospasm, respiratory depression, apnea, and emesis, these were not present in the our case.[9] These effects can be minimized by avoiding rapid IV administrations as done during procedural sedation or rapid sequence intubation, and prolonging it over the course of an hour and closely monitoring patients and intervening as necessary.[9]

Another limitation of ketamine infusion is that it may need to be repeated after a few days or weeks, as its effect diminishes over time.[16] However, similar to other chief complaints like wound care where initial treatment and management of acute exacerbations

are done in the ED, ketamine infusion therapy can be utilized in the ED for acute suicidality and depression during initial encounters and acute exacerbations and can otherwise be deferred and managed in outpatient settings if resources are available.

Finally, as there are multiple potential contraindications for ketamine, it is imperative to complete a comprehensive history and physical prior to infusion administration to minimize potential harm.[17]

While a single case is insufficient to demonstrate a causative relationship between high-dose ketamine infusion and resolution of acute suicidality and depression, the effects appear similar to the lower-dose trials seen thus far, and high-dose ketamine infusion may be useful as a potential treatment during acute exacerbations.[10,13,14]

However, prior to widespread implementation of the practice, further studies should be done in a prospective manner to more clearly delineate the dose-dependent impact of ketamine on acute suicidality and depression, and to minimize the potential for adverse events.

CONCLUSION

Depression and suicidality are common presenting complaints in the ED and require vast resources to fully evaluate, treat, and determine appropriate dispositions for patients. Our case illustrates how subanesthetic-dose ketamine infusion may be used to treat refractory depression and acute suicidality.

As there is a greater risk for adverse events with higher-dose ketamine, patients should be monitored closely and intervened upon in case adverse events occur. After treatment in the acute phase, patients should follow up outpatient with psychiatry and/or ketamine clinics if possible and return to the emergency department as needed for acute exacerbations or inability to follow up on an outpatient basis. ✶

References available online.


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ECMO...The Ultimate Antidote?

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BACKGROUND

Extracorporeal membrane oxygenation (ECMO) is a resuscitative technology that has been gaining in popularity in both intensive care units and emergency departments. The technique, pioneered in the 1950s and adapted in the 1970s by Dr. Solomon Hill, has been applied to the gamut of critically ill patients. There is no shortage of literature supporting the role of ECMO in acute coronary syndrome, sepsis, acute respiratory distress syndrome, cardiac arrest, pulmonary embolism, traumatic pulmonary contusion, and more.

Fortunately, the applications of ECMO extend beyond these somewhat common medical emergencies and into the realm of toxicologic emergencies as well.

Veno-venous (VV) and veno-arterial (VA) ECMO strategies have widespread use in many overdose cases, and as the access to ECMO-capable centers and ED cannulation protocols grows, all emergency physicians should be comfortable knowing when to consider this intervention in medical and toxicologic patients.[1,2]

ECMO MECHANICS

Numerous papers in EM Resident and other publications have described the components of an ECMO circuit in great detail; however, our toxin-specific review would be remiss without a brief overview. Although externally very complex, the mechanics of ECMO can be reduced to two major modes composed of four major components. Circuits are composed of a venous cannula that drains deoxygenated blood from the body to a membrane oxygenator that strips the blood of carbon dioxide and introduces oxygen. This blood is then fed to a pump and heat exchanger that returns it through a return cannula, either arterial or venous. This final detail is where the distinction between VA and VV ECMO is made.[1,2] Prior to initiating transfer to an ECMO center or performing a bedside cannulation, it is imperative to correct intravascular volume and electrolyte disturbances while continuing treatment for the specific ingestion.[3]

WHO IS A CANDIDATE?

The recent North American Congress of Clinical Toxicology provided an expert panel on ECMO in toxicology. In principle, ECMO is a "time-buying measure" for toxicant metabolism and can also be combined with enhanced elimination techniques such as hemodialysis. When assessing who is a candidate for ECMO, there are three major considerations:

1. The patient must have a reversible disease process (e.g., ARDS from hydrocarbon toxicity).
2. The patient's condition is refractory to conventional treatment or antidotal therapy (e.g., refractory hypotension after beta blocker overdose despite treatment).
3. There is a reasonable quality and quantity of life expected after ECMO treatment.

Once a patient meets these criteria, it is important to assess if there are any physiologic contraindications. For example, ingestion of uncoupling agents (salicylates, 2,3-dinitrophenol, etc.), situations causing distributive shock, and refractory dysrhythmias are not improved with ECMO.[3] Further discussion regarding patient suitability for ECMO should be had with the local service that would be managing the patient.

ECMO USE

From 2010-2013, more than 26,000 toxicologic emergencies were reported to the American College of Medical Toxicology (ACMT) Toxicology Consortium, and only 10 patients were placed on ECMO.[4] Overall, ECMO is used in toxicologic emergencies for cardiotoxic drugs causing refractory symptoms with no improvement to conventional treatment. Patients will usually be in

References available online.

When to consider ECMO in a patient with toxicologic exposure

- ARDS
- Persistent hypotension
- Cardiac arrest/cardiac arrhythmia
- Persistent acidosis
- Poor ventilation

shock and may have had cardiac arrest. These are unstable patients who have exhausted conventional toxicologic treatments.[5] ECMO should be considered when a patient has ARDS, persistent hypotension, cardiac arrest/cardiac arrhythmia, persistent acidosis, and poor ventilation associated with a toxicologic exposure.[4]

Table 1 describes multiple toxicologic conditions that may be temporized with ECMO.[4,6]

PROOF OF CONCEPT

As a general rule, toxicologic emergencies requiring ECMO are sparse, but ever present. This makes retrospective data collection tedious and planning for randomized controlled trials even more difficult. Despite this, primary literature still exists, serving as a proof of concept of utilizing ECMO in overdose.

According to studies by Yu et al, ECMO has utility in nitric acid and bromine inhalation overdoses.[7] There is also evidence to suggest that loperamide overdose, most frequently abused when trying to attenuate opioid withdrawal, can be treated with VA ECMO.[8] With the opioid epidemic worsening over time, this is an accidental overdose we could see more frequently in the emergency department.

Furthermore, the ACMT Consortium showed use of ECMO for a variety of overdoses, including multi-med overdoses and common medication overdoses such as calcium channel blocker, beta blocker, carbon monoxide, and cardiac glycoside overdoses.[4] Many of these patients also received aggressive supportive care, including continuous renal replacement therapy (CRRT).[4] Survival rate for patients receiving ECMO in this study was 80%. Moreover, in a 14-year single-center study, VA-ECMO for drug intoxication-induced refractory cardiogenic shock was found to be a feasible therapeutic option with a satisfactory survival rate and acceptable complication rate.[9]

When these patients present, it has been recommended that ECMO should be started as soon as the patient becomes unresponsive to optimal conventional interventions and no contraindications are present. Although evidence of the power of ECMO is still very much based in retrospective studies, case reports, and case series, ECMO has been shown to be a durable, lifesaving bridge to more definitive management in certain clinical settings.

TABLE 1

INGESTION	ECMO TYPE
Calcium Channel Blocker	VA
Beta Blocker	VA
Carbon Monoxide	VA
Cardiac Glycoside	VA
Hydrocarbons	VV
Bupropion	VA

CONCLUSION

ECMO use for toxicologic emergencies is uncommon, and its researched efficacy is based primarily on retrospective case studies. ECMO should be considered when available at your institution for severe cardiopulmonary toxicity refractory to conventional toxicologic interventions. Your institution must have ECMO available, or transfer must be completed quickly, for this to be a viable option. When considered and utilized as a treatment option, ECMO can serve as a bridge to reach definitive medical management or provide enough physiologic support to temporize a patient through an acute ingestion. ✶

References available online.

A Heartfelt Note of Thanks

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THANK YOU to our outgoing committee chairs, chairs-elect, vice chairs, and assistant vice chairs for a 2023-24 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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Caring for LGBTQIA+ Populations in the ED:
A QUICK GUIDE

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Understanding basic terminology, health disparities, and ED-specific concerns relevant to LGBTQIA+ patients is a timely and urgent task for emergency physicians. Studies have shown that provider incompetence and discrimination contribute to ED avoidance and delays in receiving acute care, particularly among transgender and nonbinary patients.

BACKGROUND

According to recent statistics, an estimated 7.1% of the U.S. adult population identifies as lesbian, gay, bisexual, and/or transgender, including one in five adults born after 1997.[1] This is likely an underestimate, as federally mandated, nationally representative data on sexual orientation and gender identity are limited and do not capture the diversity of identities or experiences of individuals who are LGBTQIA+ (lesbian, gay, bisexual, transgender, queer or questioning, intersex, asexual, and more).[2]

A disproportionate number of LGBTQIA+ patients utilize the emergency department (ED), in part due to lower rates of insurance and primary care access.[3,4] While the ED is an important source of care for LGBTQIA+ patients regardless of the presenting issue and can even serve as a touchpoint into primary care, studies have shown that provider incompetence and discrimination contribute to ED avoidance and delays in receiving acute care, particularly among transgender and nonbinary patients.[5]

Utilizing appropriate language is an important step in building trust and rapport with LGBTQIA+ patients and in working to deliver competent, sensitive, and high-quality emergency care to a historically stigmatized community. The LGBTQIA+ acronym generally encompasses those who do not identify as cisgender and/or heterosexual and is not monolithic (i.e., an individual can hold multiple LGBTQIA+ identities, and these identities can change over time).[6,7]

It is important to understand that sex — assigned at birth and based on a binary system — is distinct from gender, which is self-identified and expansive. Sex, gender, and sexual orientation should not be conflated. The language used to describe sexual orientation and gender identity is dynamic, rapidly evolving, and rooted in a deep history of oppression, activism, and reclamation. For example, the formerly derogatory term "queer" is now celebrated and embraced by many members of the LGBTQIA+ community. On the other hand, certain terms — including "transsexual," "transvestite," and "male-to-female"/"female-to-male" — are outdated and should not be used by providers to refer to transgender or nonbinary individuals unless preferred

References available online.

by patients.

Understanding basic terminology, health disparities, and ED-specific concerns relevant to LGBTQIA+ patients is a timely and urgent task, as LGBTQIA+ rights continue to be debated across the United States and proposed anti-transgender legislation threatens to restrict transgender health care.

RISK FACTORS/CLINICAL OUTCOMES

Several health and health-care disparities impact the LGBTQIA+ community. Rates of sexually transmitted infections, including HIV, are disproportionately high among men who have sex with men and transgender women.[8,9] LGBTQIA+ people have higher rates of mental health conditions, including substance use, mood disorders, and suicidal ideation: A 2022 national survey by The Trevor Project found that in the past year, 45% of LGBTQIA+ youth reported suicidal ideation, with one in five transgender and nonbinary youth attempting suicide.[10,11]

Compared to the cisgender and heterosexual population, LGBTQIA+ people experience more negative outcomes related to the screening, prevention, and management of cardiovascular diseases and certain cancers.[12] Transgender women on gender-affirming hormone therapy have a greater risk of venous thromboemboli and ischemic strokes when compared to cisgender men and women.[13] These disparities are all compounded by alarming rates of homophobic and transphobic violence, racism, classism, xenophobia, and homelessness, as well as the lack of accessible comprehensive health services for LGBTQIA+ patients.[14]

BEDSIDE AWARENESS

ED providers can care for, and advocate for, LGBTQIA+ patients at the bedside by:

- Asking all patients for their name(s) and pronoun(s), informing the entire care team, and requesting that the care team use patient-reported identifiers. If you make a mistake, apologize, correct yourself, and move on.
- Correcting team members who misgender patients and speaking up if someone makes derogatory comments or jokes. In doing so, you are helping create an environment that does not tolerate patient discrimination, harassment, or mistreatment.
- Explaining the medical necessity of asking questions about genitals, gender-affirming care, and/or sexual history to patients. Do not ask these questions out of curiosity.
- Minimizing assumptions when taking a sexual history. Avoid using the binary approach of asking "men, women, or both?" Prioritize open-ended questions such as "How many sexual partners do you have?" or "What genders are your partners?"[7]
- Recognizing that gender-affirming therapies are often life-saving and not simply elective or cosmetic. For example, a patient on gender-affirming hormone therapy who is found to have a DVT should not immediately be counseled to stop hormones without further discussion.[15]

KEY ACTIONS

As ED providers, we can address these social/structural determinants of health by:

- Advocating for the inclusion of self-identified names and pronouns within the electronic health record (EHR) system that are clearly visible and accessible by the health-care team.[7] Additionally, incorporating the use of an organ inventory within the EHR can help identify screening opportunities (e.g., pregnancy screening for a transgender man who has a uterus)[7]
- Standardizing sexual orientation and gender identity data collection at triage, preferably via written form rather than verbal disclosure[16]
- For pediatric patients, ensuring sexual orientation and gender identity data are collected confidentially and notes available to parents or guardians are marked as sensitive, to avoid inadvertently outing patients[15]
- Integrating public signage and structural changes to make LGBTQIA+ individuals feel comfortable and safe (e.g., gender-neutral restrooms, non-discrimination placards, gender-neutral language on forms)[5]
- Advocating for standardized training in LGBTQIA+ health for all members of the health-care team, and for formal inclusion of LGBTQIA+ health topics in medical school and residency curricula as well as continuing medical education for attending physicians[5,7] ✶

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

References available online.

Effective and Safe Opioid Dosing for Opioid-Tolerant Patients in the ED

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CASE PRESENTATION

In the middle of a busy evening shift, EMS arrives with a 68-year-old woman complaining of abdominal pain. The patient has a history of non-small cell lung cancer with known liver and adrenal metastases. She is currently on immunotherapy after having difficulty tolerating multiple lines of cytotoxic chemotherapy and radiation due to side effects. She reports that the pain is most focal in the right upper quadrant, characterizing it as dull and gnawing, sometimes with sharp waves that last a few minutes.

The pain has been increasingly difficult to control using her home regimen of oxycodone extended release (ER) 30 mg twice daily (60 mg total), as well as oxycodone immediate release (IR) 15 mg Q4 hours PRN, which the patient had taken 4 times in the past 24 hours for breakthrough pain.

A CT scan of the abdomen and pelvis shows an increase in the size of her liver and adrenal metastases, but no other acute abnormalities.

Looking at her home medication regimen, you start to feel overwhelmed.

"How can I get her pain under control safely?" you ask yourself.

OPIOID DOSE-FINDING

Pain perception is a complex and dynamic process with multiple inputs including the pain stimulus itself, excitatory and inhibitory pathways in the spinal cord, changes in the number and type of opioid receptors expressed on various tissues and in the CNS, and our cognitive and emotional processing of pain.

In patients with advanced cancer, the combination of disease progression over time, as well as habituation to chronic opioids, often leads to the need to increase opioid dosing over the course of illness; this is called opioid tolerance. Patients with chronic opioid use and tolerance will generally require higher doses of opioids for rescue when they present to the ED with an acute pain crisis.

The following strategy can be used in the ED for those patients who present in acute pain while using chronic opioids. It is the most commonly recommended strategy among palliative care clinicians who manage cancer-related pain.

STEP 1: Continue the patient's long-acting opioid

Many patients on chronic opioids will be started on long-acting formulations, which minimize the peaks and valleys of effective analgesia frequently experienced by patients with usage of immediate release opioids. Oral immediate release opioids generally reach peak effect after approximately 1 hour, and then lose effectiveness after 3-4 hours, whereas long-acting formulations provide more stable analgesia for longer periods of time. Despite this, most patients will still have breakthrough pain on long-acting opioids and will require additional immediate release opioids PRN.

Oral long-acting agents are notated

References available online.

by acronyms such as controlled release ("CR"), sustained release ("SR"), and extended release ("XR/ER"); these can indicate slightly different chemical properties and rates of release, but are functionally interchangeable. The common suffix "-contin", is short for "continuous" and indicates a continuous or controlled-release formulation (e.g., Oxycontin, MS Contin). Transdermal agents include fentanyl patches and, increasingly commonly, buprenorphine patches (Butrans). Other infrequently prescribed long-acting oral agents include hydromorphone (Exalgo, Palladone), oxymorphone (Opana ER), tramadol (ConZip), and tapentadol (Nucynta ER). Methadone and sublingual buprenorphine, both commonly used for medication-assisted treatment (MAT) for opioid use disorder (OUD), are also sometimes used as long-acting analgesics; however, their pharmacology is much more complex, and these patients should be discussed with an expert from palliative care, pain management, or addiction medicine. Hospice-enrolled patients also may occasionally present to the ED with home patient-controlled analgesia (PCA) pumps that also have a basal infusion rate, which acts as the long-acting or continuous dose.

STEP 2: Determine the patient's daily opioid use prior to ED presentation

In order to treat your patient's pain crisis, the total daily dose of opioid they have been taking must be calculated; this will allow you to more accurately and safely determine how much IV opioid the patient will require and can safely tolerate. You may need to speak with family or other caregivers to determine this information.

When calculating total daily opioid use, immediate release and controlled or extended release milligrams are counted the same. For example, a patient on 30 mg oxycodone CR twice daily in the past 24 hours (=60 mg), and who has taken oxycodone IR 15 mg four times in the past 24 hours (=60 mg), would be counted as having taken 120 mg oxycodone total. This total should then be converted into a reference standard: oral morphine equivalents (OME), sometimes also called morphine milligram equivalents (MME). Equivalence ratios of commonly used opioids include:

10 mg IV morphine = 30 mg PO morphine (OME)
20 mg PO oxycodone = 30 mg PO morphine (OME)
7.5 mg PO hydromorphone = 30 mg PO morphine (OME)
7.5 mg PO hydromorphone = 1.5 mg IV hydromorphone
Fentanyl patch @ 15 mcg/hr x 24 hours = 30 mg PO morphine (OME)

For these equivalences in table form, see **Table 1**.

For this patient, the conversion of oxycodone IR and ER to OME is shown in Graphic 1.

TABLE 1

DRUG	ORAL (PO)	PARENTERAL (IV, IM)	TRANSDERMAL
Morphine	30 mg = 30 OME (reference standard)	10 mg	-
Hydromorphone	7.5 mg	1.5 mg	-
Oxycodone	20 mg	- (not available in U.S.)	-
Fentanyl	- (rarely prescribed)	150 mcg	15 mcg/hr (24hr total = 30 OME)

STEP 3: Convert 24 total OME into the IV opioid of choice

The most commonly used IV opioids in the United States are morphine, hydromorphone, and fentanyl. All three have advantages and disadvantages that are beyond the scope of this article. However, for some major considerations, see **Table 2**.

The patient tells you that she has had significant nausea with morphine in the past and would prefer to avoid it. You consider fentanyl, but you are worried about its short duration of action. *To optimize tolerability as well as duration of action, you select hydromorphone IV, shown in Graphic 2.*

STEP 4: Give 10-20% of the daily total frequently until pain controlled

The patient's 24-hour total equivalent dose is 9 mg hydromorphone IV, and a 10-20% range is 0.9-1.8 mg/dose. You elect to give 1 mg doses.

Twenty minutes after the initial dose, the patient reports mild pain relief and asks when she may receive more pain medication. As noted in **Table 2**, hydromorphone reaches peak effect at 15-20 minutes; thus your risk of dose stacking is very low if you repeat the dose approximately as often. The peak effect of

GRAPHIC 1

(60 mg/day oxycodone ER) + (60 mg/day oxycodone IR) = 120mg PO oxycodone

$$\frac{\text{120mg PO oxycodone}}{\text{20mg PO oxycodone}} = \frac{\text{Xmg PO morphine (OME)}}{\text{30 OME}} \quad \text{solve for X: X = 180 OME}$$

GRAPHIC 2

$$\frac{\text{180 OME}}{\text{30 OME}} = \frac{\text{Xmg IV hydromorphone}}{\text{1.5mg IV hydromorphone}} \quad \text{solve for X: X = 9mg IV}$$

References available online.

TABLE 2

IV OPIOID	ADVANTAGES	DISADVANTAGES	TIME TO PEAK EFFECT	DURATION OF ACTION
Morphine	- Inexpensive - Easy conversion to multiple formulations - Least euphoria, likely lowest abuse potential	- Causes dysphoria, nausea, other AEs more commonly - AVOID in renal disease, moderate or severe liver disease	20–30 min	2–4 hours
Hydromorphone	- Well tolerated, including in renal and liver disease - Commonly available - High receptor affinity (helpful if on MAT)	- Causes euphoria, may have higher abuse potential	15–20 min	2–4 hours
Fentanyl	- Safest in severe renal or liver disease - Commonly available - Rapid onset/peak - High receptor affinity	- Causes euphoria, may have higher abuse potential - Short duration of action may lead to inadequate analgesia	7–10 min	45–90 min

a dose of an opioid includes the maximal analgesic effect and the maximal sedative/toxic effect, meaning that if the patient is not sedated 10 minutes after a dose of fentanyl, 20 minutes after a dose of hydromorphone, or 30 minutes after a dose of morphine, it is safe to give another dose. Additionally, sedation will reliably occur before clinically significant respiratory depression does, meaning that if the patient is awake, the likelihood of causing dangerous toxicity, specifically respiratory depression, is extremely low. This is the safety mechanism that underlies the use of patient-controlled analgesia (PCA) pumps: As long as each incremental dose is unlikely to cause serious toxicity, the patient will fall asleep and stop pushing the PCA button before clinically significant respiratory depression occurs.

IV and immediate release oral opioids should be dosed q2-4hrs PRN only AFTER the effective dose has been identified using the rapid re-dosing strategy outlined above.

CASE RESOLUTION

The patient is continued on her oxycodone CR 30 mg PO 2 times daily in the ED, and following 3 doses of 1 mg IV hydromorphone Q20 min, reports adequate pain control. Now that you have found an effective PRN dose, you continue the patient's oxycodone ER 30 mg 2 times daily, and write for hydromorphone 3 mg IV q4hrs PRN.

You speak with her oncologist, who thus far has been managing her outpatient pain medications, and review her care in the ED. The oncologist feels that this is a large enough increase in her PRN opioid needs that it would make sense to admit the patient to the oncology service for palliative care consultation and assistance with developing a new opioid regimen. You admit the patient to the oncology service and recommend to the admitting resident that they continue her oxycodone ER 30 mg BID, as well as hydromorphone 3 mg IV q4hrs PRN.

Palliative care is consulted the following morning and further adjusts her oral long-acting and PRN opioid regimen. Thanks to your dose-finding efforts in the ED, the patient's hospital length of stay is decreased by 1-2 days, and 36 hours later she is discharged home, with pain well controlled under her new regimen. ✶

References available online.

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What do I do With This Abnormal Tattoo?

A Focused Guide on Tattoo-Related Complications for the Emergency Physician

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An estimated 10–20% of Americans have tattoos, with the prevalence dramatically increasing among younger generations.[1] Tattoos are typically done in professional settings, but education on best practices regarding hygienic tattooing and after-care varies heavily. Some tattoos are done by amateurs with minimal or no training in these best practices, further increasing the risk of complications.[1]

Some patient populations are at increased risk of tattoo-related complications, particularly those who are immunocompromised, have numerous allergies, or have certain dermatologic conditions.[2]

This article will focus on the appropriate empiric treatments for tattoo-related complications in the emergency department based on an

References available online.

initial skin examination.

NORMAL HEALING

The normal healing process of a tattoo includes symptoms such as pruritus, pain, and paresthesias. Examination findings include bleeding, edema, erythema, tenderness, serous drainage, crusting, and localized lymphadenopathy. These signs and symptoms are limited to the area immediately surrounding the tattoo and persist for 2–3 weeks on average, with gradual improvement following a 2–3 day period of improvement.[3,4]

Discharge recommendations for a patient with a normally healing tattoo are not standardized but should include constant sun protection, avoidance of contact with non-potable water, and covering the skin with a dry cloth dressing.[5] Spreading redness, worsening pain, and increasing edema should prompt re-evaluation.

INFECTIOUS COMPLICATIONS

Infection in the area of a tattoo can be difficult to differentiate from normal healing as described above. Infection typically results in progressively worsening edema, warmth, and erythema over a short period of time (2–3 days). The locus of infection may be a single color of the tattoo in the setting of non-sterile ink or the entire tattoo if contamination of the tattoo needles or skin is the primary source of infection.[3,4] The incubation time of infections is inconsistent, but signs and symptoms generally present within 4–22 days of tattoo placement.[4]

Folliculitis presents with pustules and papules at the base of hair follicles. **Impetigo** presents with papules that progress to vesicles with an erythematous base and rupture to form an adherent honey-colored crust. **Ecthyma** presents with deeper lesions that are "punched-out" with raised violaceous margins. These lesions will typically be clustered within the tattooed area of skin but may affect normal skin close to the tattoo. These lesions are known as superficial pyogenic infections and are typically due to infection with methicillin-sensitive staphylococcus aureus (MSSA).[6] Isolated folliculitis often spontaneously resolves but may be treated with topical mupirocin 2% TID for 5 days. Impetigo and ecthyma can be treated with cephalexin QID for 7 days. Patients with a history of MRSA may be treated with doxycycline 100 mg BID, clindamycin 450 mg QID, or trimethoprim-sulfamethoxazole 160/800 mg BID for up to 14 days with primary care follow-up to ensure resolution.[6]

Tattoo inks are composed of numerous compounds that all act as antigens and provoke an immune response.

Erysipelas and **cellulitis** are defined by an area of warmth, edema, and erythema that spreads more intensely than expected during the normal tattoo healing process. In tattooed skin, these infections will often present as a sudden increase in the erythema and edema after an initial period of improvement following tattoo placement. Antibiotics that cover MSSA and beta-hemolytic streptococci such as cephalexin 500 mg QID for 6 days are appropriate initial treatments.[6,7] Intravenous antibiotics and MRSA coverage with vancomycin 15 mg/kg should be considered in patients with systemic signs of infection, purulent drainage, immunosuppressive conditions, or known MRSA colonization.[6] While official recommendations are limited, a patient who appears systemically well but has the aforementioned risk factors for MRSA could be treated with oral doxycycline 100 mg BID, clindamycin 450 mg QID, or trimethoprim-sulfamethoxazole 160/800 mg BID for 14 days with strict return precautions.

Mycobacteria naturally present in tap water can be introduced into the skin if non-sterile water or improperly stored sterile water is used to dilute ink. Mycobacteria grow slowly and can cause infectious symptoms months after wound healing.[2,4] Mycobacterial infections present with a combination of scattered erythematous papules, nodules, pustules, ulcers, and plaques in multiple stages of healing that are not limited to the area of the tattoo.[8] If a mycobacterial infection is suspected, referral to dermatology for biopsy-guided treatment is required.

Finally, **necrotizing infections** are possible in the setting of tattooing. These present similarly to necrotizing infections from any other source and should be treated with intravenous piperacillin-tazobactam 3.375 g, vancomycin 15 mg/kg, clindamycin 900 mg, and prompt surgical referral.[3]

ALLERGIC COMPLICATIONS

Tattoo inks are composed of numerous compounds that all act as antigens and provoke an immune response. These antigens can cause serious localized reactions in some patients. The most common allergic responses to tattoo ink are contact dermatitis, photodermatitis, and lichenoid reactions.[2,8]

Contact dermatitis is a type IV hypersensitivity reaction to a component of the tattoo ink. Unlike contact dermatitis which results from superficial skin contact, dermatitis resulting from the injection of tattoo ink is typically more severe. Contact dermatitis typically presents within 2 weeks of tattoo placement with erythema, edema, and bullae in the area of the tattoo. This may lead to desquamation of skin, crusting, and increased serous drainage. The most severe symptoms will be present in the area of the tattoo, but mild symptoms may be present in patches surrounding it.[3,4] Topical treatment with triamcinolone 0.1% or clobetasol 0.05% is preferred due to the long courses of systemic steroids that would be required to provide extended relief.[9] Continuing treatment until the patient can seek dermatology follow-up is recommended. Lack of relief with topical therapies or greater than 30% total body surface area involvement should be treated with prednisone 0.5–1 mg/kg tapered by 50% per week for 3 weeks.[9]

Photodermatitis presents with the sudden onset of swelling, pruritus, pain, and erythema in one or more colors of

References available online.

a tattoo with sun exposure. Symptoms may occur in tattoos of any age. Photodermatitis is typically self-limited and improves gradually with the removal of the tattoo from the sun. While typically associated with red tattoos, reactions to black and blue ink are also common.[10] Conservative treatment consists of cool compresses, cetirizine 10 mg qD to BID, and use of mineral sunscreens in the event of future sun exposure.

A **lichenoid reaction** is the most common tattoo-related complication. It can occur within weeks of tattoo placement or years later. A lichenoid reaction typically presents with multiple flat-topped papules or plaques within the area of the tattoo. Most notable is the lack of other exam findings that would suggest an infectious or allergic process. Acute treatment is not required. Follow-up with dermatology for biopsy is necessary to differentiate these lesions from other chronic skin conditions and verrucae from HPV infection.[4]

AUTOIMMUNE COMPLICATIONS

Patients with a history of lichen planus, psoriasis, and eczema may have localized flares of disease in the area of a recently placed tattoo.[11] The skin trauma from tattoos may also induce the Koebner phenomenon, the diffuse spread of skin lesions from a chronic dermatosis in the setting of skin trauma.[12] In the emergency setting, lesions from these conditions are difficult to differentiate from allergic complications. Fortunately, management of these conditions is similar to allergic tattoo reactions: referral to dermatology for consideration of systemic treatment with immunomodulatory medications. If concern for infection is low, topical treatment with triamcinolone 0.1% or clobetasol 0.05% may provide some relief of symptoms.[13]

TAKE-HOME POINTS

- Progressive erythema, edema, and pain after an initial period of improvement are signs of tattoo-related infection.
- Patients with suspected tattoo-related infections who do not have systemic symptoms, histories of MRSA infections, and an absence of purulent production, and who are not immunocompromised, do not require MRSA coverage. They can be safely treated with a 6-day course of cephalexin 500 mg QID.
- A tattoo-related infection associated with systemic symptoms should prompt consideration of admission for intravenous vancomycin (typically 15 mg/kg).
- Allergic reactions to tattoo ink generally present with symptoms localized to the area of the tattoo and are best treated with topical triamcinolone 0.1% or clobetasol 0.05% followed by dermatology referral. ✶

References available online.

A Heartfelt Note of Thanks

EMRA 2023-24 Medical Student Council

We'd like to say ***THANK YOU*** to our outgoing Medical Student Council for a 2023-24 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 would like to extend a big, heartfelt welcome and congratulations to our incoming MSC leaders for 2024-25!

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more info

Cloudy With a Chance of Thyroid Storm: A "Grave" Condition

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CASE

A 42-year-old woman, recently diagnosed with Graves' disease, presents to the emergency department with one day of anxiety, palpitations, and a burning sensation of her skin. She also reports headache, fever at home to 103°F, and watery diarrhea over the past three days. She denies a history of similar episodes or recent illnesses. One month prior, the patient was started on methimazole and atenolol daily; she reports she has been adherent.

Her vitals include: temperature 101.2°F, blood pressure 152/88, heart rate 122, pulse oximetry 100% on room air, and respiratory rate 20. The patient is anxious and diaphoretic with resting bilateral hand tremors and 1+ bilateral lower extremity edema on exam. Workup is notable for thyroid stimulating hormone (TSH) <0.01, T3 233, free T4 1.43, an unremarkable chest X-ray, and sinus tachycardia on ECG.

MAKING THE CLINICAL DIAGNOSIS

Thyrotoxicosis is a clinical syndrome caused by excess circulating thyroid hormone. Thyroid storm (TS) is the extreme clinical presentation of thyrotoxicosis caused by a hypermetabolic and hyperadrenergic state. It can be difficult to recognize, given its presentation mimics other etiologies of altered mental status. The differential diagnosis includes infection/sepsis, toxidrome (notably

References available online.

stimulant use), structural etiologies (e.g., pheochromocytoma), and metabolic derangements (e.g., hypoglycemia).

TS leads to multi-organ dysfunction:

Neurologic: somnolence, coma, lethargy, convulsions, psychosis, restlessness, delirium, agitation

Gastrointestinal and hepatic: nausea, vomiting, diarrhea, abdominal pain, jaundice, elevated serum bilirubin, transaminitis

Cardiac: palpitations, dyspnea, lower extremity edema and fatigue. Tachycardia is common in TS, with higher ventricular rates, atrial tachyarrhythmias being common (atrial fibrillation, atrial flutter, etc). Additionally, high output heart failure is common with widened pulse pressure.

Thermoregulatory: fever (often in excess of 102°F), diaphoresis with evidence of dehydration

DIAGNOSTICS

TS is a clinical diagnosis. Recognition and immediate initiation of treatment are critical to minimize morbidity. Fever and tachycardia are extremely common.

If not considered on the differential diagnosis of altered mental status, this is an easy diagnosis to miss. The Burch and Wartofsky Point Scale is a scoring tool that can aid in the diagnosis of TS. This scale is based on severity of hyperpyrexia, tachycardia, central nervous system involvement, gastrointestinal symptoms, heart failure, presence of atrial fibrillation, and precipitating factors.

Regarding lab findings, low TSH is usually suggestive of TS; however, it is not specific as TSH can be reduced due to chronic hepatic or renal disease, steroid use, and other reasons. High free T3, low TSH, and high/normal free T4 are common findings in patients with TS. Rarely, TSH is elevated due to secondary hyperthyroidism.

Additional diagnostic studies should be performed to evaluate for precipitating causes of TS including infection, acute coronary syndrome (ACS), metabolic disturbances such as diabetic ketoacidosis (DKA), electrolyte disturbances, pregnancy in women of childbearing age, surgery, thromboembolic events, medication changes or nonadherence, and iatrogenic etiologies (such as an iodine load from intravenous [IV] contrast).

CRITICAL INTERVENTIONS

Patients presenting with TS require emergent intervention. Immediate management includes aggressive fluid resuscitation, although providers need to be mindful of comorbid heart failure. In fulminant volume overload, diuresis may be indicated. Acetaminophen and ice packs may aid in defervescence and cooling. Salicylates should not be given, as they increase free T3 and T4.

In addition to addressing any obvious trigger (infection, metabolic abnormality), the following medical management (**Image 1**) should be initiated, in order:

BETA-BLOCKERS

Propranolol: blocks adrenergic effects and inhibits T4 to T3 conversion at increased doses. Non-cardiac specific, comes in IV formulation, cautious use in patients with heart failure. Contraindicated in asthma. Dose: 40-80 mg PO every 4 hours, or 1-2 mg IV every 4 hours.

Esmolol: Reduces symptoms due to increased adrenergic tone. Short acting, titratable, better in patients with heart failure. Dose: 500 ug/g/min over 1 minute and then 50-100 ug/kg/min IV.

THIONAMIDES

Propylthiouracil (PTU): inhibits production of T4 and T3 and blocks peripheral T4 to T3 conversion. FDA advisory for liver toxicity. Safer in first trimester of pregnancy. Dose: 500-1000 mg loading dose and then 250 mg every 4 hours. PO, NG, PR.

Methimazole: Blocks new hormone synthesis. Safer than PTU in second and third trimester of pregnancy. Dose: 60-80 mg/day PO, NG.

IODINE

Potassium iodide and Lugol's solution: Blocks release of hormone from thyroid. Potassium iodine dose:

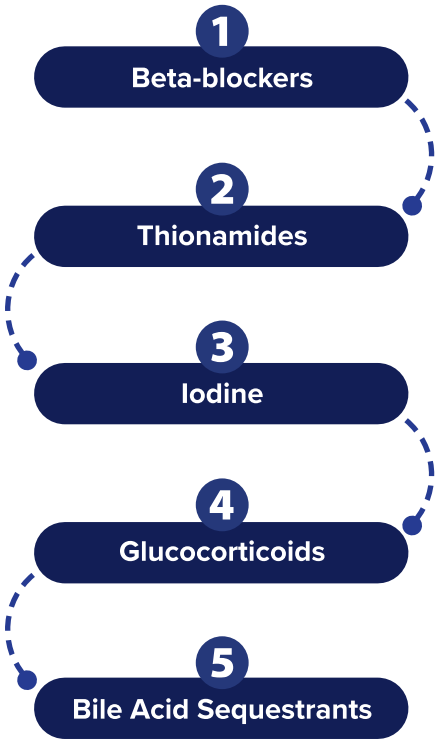

IMAGE 1: MEDICAL MANAGEMENT

250 mg every 6 hours PO or NG. Lugol's solution dose: 4-10 drops every 6-8 hours PO or NG.

Sodium ipodate and iopanoic acid: Blocks release of hormone from thyroid and inhibits T4 to T3 conversion. Sodium ipodate dose: 1-3 g daily PO. Iopanoic acid dose: 1g every 8 hours for 24 hours, then 500 mg every 12 hours PO.

Note: Give at least 1 hour after thionamide therapy is initiated. If given prior to thionamide administration, iodine-containing medications can worsen TS.

GLUCOCORTICOIDS

Mechanism: Inhibits peripheral conversion of T4 to T3, improves adrenal dysfunction and outcomes.

Dexamethasone dose: 2mg IV, PO, NG every 6 hours.

Hydrocortisone dose: 300 mg load, then 100 mg IV every 8 hours until resolution of symptoms.

BILE ACID SEQUESTRANTS

Cholestyramine: reduces reabsorption of metabolized hormone from

References available online.

enterohepatic circulation and facilitates excretion. Dose: 4g orally twice or 4 times daily.

DISCUSSION

The clinical manifestations of TS overlap with many illnesses. Therefore, the diagnosis can be challenging to make. However, prompt recognition and evaluation of those presenting with a hypermetabolic state — especially if febrile — is key to diagnosis and initiation of management. It is critical to begin stepwise therapy and evaluate for precipitating factors. Still, no specific precipitant is identified in up to 30% of cases.

TS commonly occurs in patients with Graves' disease, as in this case. Graves' disease is caused by thyrotropin receptor antibodies that stimulate uncontrolled thyroid hormone synthesis. It is the most common underlying cause of hyperthyroidism in TS and more frequently affects women.

TS has a high mortality rate (8-30%). Prompt diagnosis and treatment are critical. Multi-organ failure and heart failure are the most common causes of mortality. Prompt treatment and escalation of care to intensive care unit settings can be lifesaving. Most patients with TS will begin to show clinical improvement in 24-48 hours. In rare cases, patients may have refractory disease. In conjunction with endocrinology, patients may be eligible for therapeutic plasma exchange or referral for thyroidectomy. Definitive management is radioactive iodine ablation or surgery.

TAKE-HOME POINTS

- Clinical features of thyroid storm include cardiovascular symptoms (tachycardia, congestive heart failure), hyperpyrexia, central nervous system disturbance (agitation, psychosis, coma), and gastrointestinal symptoms (vomiting, diarrhea, abdominal pain).
- Treatment should begin with fluid resuscitation, administration of beta blocker followed by initiation of thionamide and glucocorticoids.
- Common triggers for thyroid storm include infection, metabolic disturbances, ischemic pathology, medication changes or nonadherence, ACS, and pregnancy. Up to 30% of patients may have no obvious trigger. ✶

References available online.

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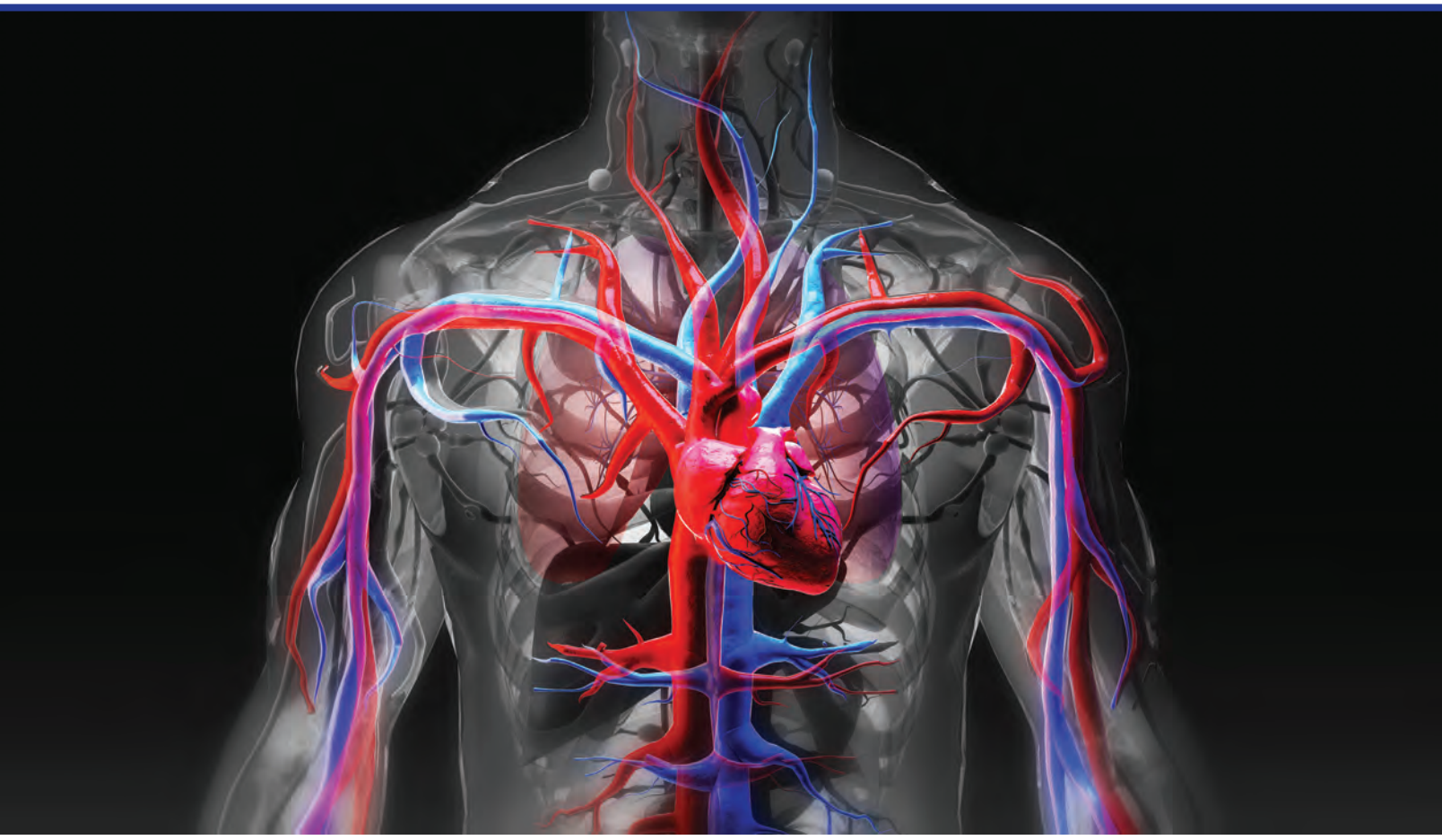

Mechanical Circulatory Support: A Viable Option for Some Patients With Advanced Heart Failure

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PURPOSE OF MCS

A mechanical circulatory support (MCS) device is a surgical option for patients who have had unsuccessful experiences with optimal medical therapies for advanced heart failure. These therapies ideally bridge a patient from acute onset to long-term cardiac transplantation. But for patients ineligible for transplants, MCSs are a lifeline for cardiac support and allow improved quality and functional status for survival.[1]

The Interagency Registry for Mechanically Assisted Circulatory Support (INTERMACS) reports more than 15,000 patients received durable MCSs between June 2006 and December 2014, with a 1-year and 2-year survival rate of 80% and 70%, respectively.[2]

In the acute setting of cardiogenic shock or cardiorespiratory failure secondary to advanced heart failure, short-term and intermediate-term MCS may be used to escalate therapy when optical medical management has failed. These modalities are typically in place for 30 or fewer days. They are widely used during electrophysiology and interventional cardiology procedures.[3]

Temporary MCSs are indicated in patients when recovery is expected (bridge-to-recovery) or more time is needed to decide definitive treatment when an outcome is unknown (bridge-to-decision).[4]

Contraindications generally include patients who would not benefit from a bridging therapy due to severe irreversible end-organ damage, disseminated malignancies, peripheral vascular disease, or any contraindication for anticoagulation.

Each individual device has specific contraindications and specific functions.[5] Three of the most popular modalities include intra-aortic balloon pump (IABP), Impella, and extracorporeal membrane oxygenation (ECMO).

INTRA-AORTIC BALLOON PUMP

IABP counterpulsation is the most

References available online.

commonly used temporary MCS device in patients with cardiogenic shock and myocardial ischemia.[6] About 15-30% of all IABP is used in patients after cardiac surgery requiring cardiopulmonary bypass.

The balloon is inserted into the proximal descending aorta, then rapidly inflates during diastole and deflates during systole. Inflation of the balloon augments diastole by increasing preload, thus increasing perfusion to the coronary arteries and perfusion. Rapid deflation of the balloon causes reduced left ventricle (LV) afterload and LV end-diastolic pressure, therefore decreasing myocardial oxygen consumption and work by decreasing the isovolumic phase of ventricular systole.[7] The resulting increase of the myocardial perfusion, despite not fully increasing systemic blood flow, increases cardiac output (CO) by 20%.[6] The IABC is traditionally placed via the femoral artery; however, it can be placed in the brachial or subclavian arteries as well. In even more rare cases of severe peripheral vascular disease or repaired aortic dissection, the left axillary artery or aortic arch can be accessed.[8]

IMPELLA

The Impella pump works by fully offloading the LV and improving blood flow to the myocardium while reducing oxygen demand on the heart. Commonly, it is used in cases to treat postcardiotomy shock. This improves coronary flow and decreases microvascular resistance.[9] This unloading of the LV is critical, and in pig studies has been found to decrease the baseline infarct size by 5 times in LAD occlusions.[9] If necessary, a right ventricular Impella may be placed.

The Impella requires a constant infusion of heparin directly into the pump at about 25% of the ECMO requirement.[9]

Ideally it is placed via right femoral artery access, as it is the fastest site to obtain. Axillary arterial insertion requires surgical intervention, but is a more permanent solution on patients waiting for transplantation or requiring longer stays.[10]

ECMO

Venous-arterial (VA) extracorporeal membrane oxygenation (ECMO) is the fastest way to improve circulation in a patient with acute cardiogenic shock and prevent end-organ failure. VA ECMO provides support to the heart and lungs; however, it does not unload the work of the left ventricle. ECMO provides a temporary solution to a more definitive intervention by extracting venous blood from a large vein, passing through an oxygenation circuit, and returning through a large artery.[11]

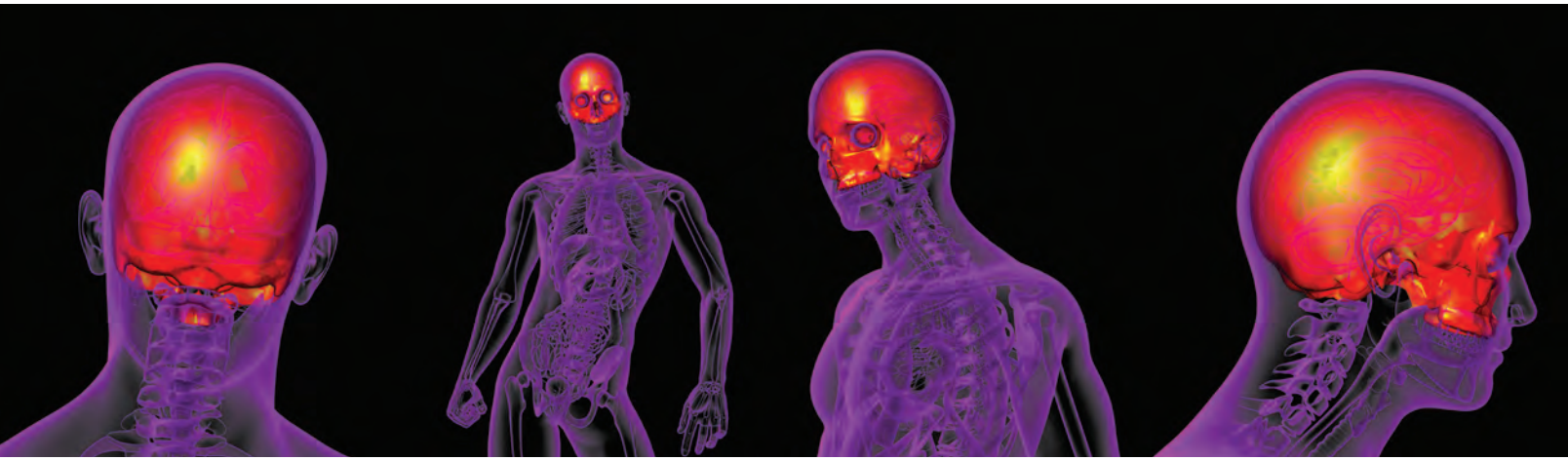
Femoral and internal jugular arteries and veins are the preferred location.

VA ECMO indications for cardiogenic shock include fulminant myocarditis, acute myocardial infarction, post-cardiotomy, and post-heart transplantation. Venous-venous (VV) ECMO, however, only provides lung support and involves 2 large vein cannulations.[12] It serves as a therapeutic notion in patients with severe respiratory failure and supports systemic circulation. Although this system provides oxygenation to patients in cardiac or respiratory failure, it is highly dependent on patients' hemoglobin and blood flow status. Therefore, hemoglobin must be maintained above 12.[13]

TREATMENT CONSIDERATIONS

- All patients receiving these procedures must also receive full anticoagulation with heparin. Therefore, there must be NO contraindications for anticoagulation.
- The practitioner must be mindful of where intravenous lines are being placed prior to initiation of MCS, to not cause hematomas or excessive damage to large vessels required for cannulation or placement of device.
- Multiple devices may be inserted to be used simultaneously by an electrocardiologist.
- Most hospitals do not have these modalities and require the patient to be transferred to a tertiary care center. Consultation calls should be made to specialists early on in the course of patient stay, even during cardiac arrest in specific cases such as ventricular storm. ✶

References available online.



Neurosyphilis: Keep it in Mind When Symptoms Align

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CASE INTRODUCTION

We present the case of a patient with a rash, uveitis, and neurosyphilis.

Our patient, a 37-year-old male with a history of Crohn's disease, presented to the emergency department with a headache, uveitis recognized during an outpatient ophthalmology appointment, and a recent diagnosis of syphilis.

The patient previously had complained of a rash for several months that initially was attributed to a drug reaction; however, when it failed to improve, further testing was performed, and he was found to have syphilis. The patient had a positive rapid plasma reagin (RPR) during an outpatient visit 1 week prior to presentation to the ED and had been treated with 1 dose of intramuscular penicillin.

In the ED, non-contrast CT of the head was performed with no evidence of acute abnormality of the brain. A lumbar puncture was performed; grossly clear fluid was obtained and sent for further testing. The decision was made to start intravenous penicillin with concern for neurosyphilis, given the constellation of symptoms.

DISCUSSION

According to the CDC, cases of syphilis nationwide have been on the rise since 2000. In 2020, 133,945 cases were reported, approximately one-third of which were primary and secondary syphilis, the most infectious stages of the disease.

Syphilis is more commonly seen in men than women, and 38% of reported cases are in men who have sex with men (MSM).[1] The highest rates of primary and secondary syphilis occur in the 25-29 year old age group.[1] People at highest risk include the MSM population, and men or women living with HIV. Syphilis has often been called "The Great Masquerader" because the symptoms are nonspecific at times, and it is likely that syphilis is underdiagnosed because of this.[2]

Primary syphilis classically presents as a painless genital ulcer that appears approximately 2-3 weeks after exposure, and patients often develop regional firm lymphadenopathy.[3] Without treatment, these symptoms typically resolve in 3-8 weeks; however, if untreated, hematogenous spread of treponema pallidum can occur, leading to secondary syphilis.[3]

Symptoms of secondary syphilis can be rather non-specific and include general malaise, fevers, and a widely variable body rash. The rash is typically nonpruritic in any combination of macular, papular, or pustular lesions involving the chest, back, palms, and soles; alopecia; or mucus patches.[2]

Tertiary syphilis is the rarest form because of screening and treatment for earlier stages. It most often includes gummatous lesions, cardiovascular syphilis, and late neurosyphilis, and may present as general paresis, tabes dorsalis, or with psychiatric manifestations.[3]

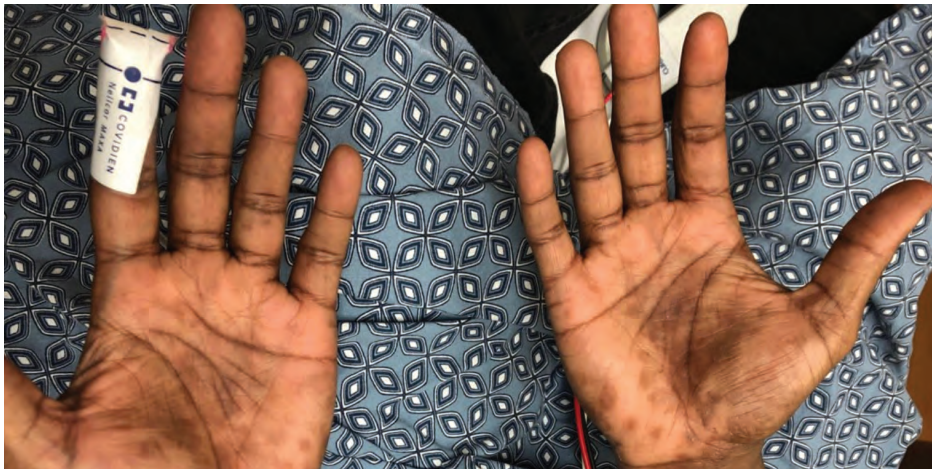
Neurosyphilis can occur at any stage of syphilis and can be characterized as early or late neurosyphilis, and ocular and otic involvement may occur in either early or late infection.[3] Ocular

References available online.

syphilis most commonly presents as uveitis in any form, but you may also find episcleritis, retinitis or optic neuritis.[4] Otosyphilis usually presents with hearing loss, tinnitus, or vertigo. In patients with suspected ocular or otosyphilis, examination by the respective specialist should be performed, and lumbar puncture should be considered if there is any concern for neurosyphilis.[5] Additionally, lumbar puncture should be performed if there is any cranial nerve abnormality. The diagnostic test is the venereal disease research laboratory (VDRL) test in the cerebrospinal fluid (CSF).[3]

Parenteral penicillin G is recommended and efficacious for primary and secondary syphilis, and for preventing late sequelae. The recommended regimen among adults is a single dose of benzathine penicillin G 2.[4] million units IM.[6]

In patients with neurosyphilis, ocular syphilis, and/or otosyphilis, the recommended treatment regimen is aqueous crystalline penicillin G 18-24 million units per day, administered as 3-4 million units IV every 4 hours or continuous infusion for 10-14 days.[6] A proposed alternative treatment can be considered if compliance with therapy can be ensured: procaine penicillin G 2.4 million units IM once daily plus probenecid 500 mg orally 4 times per day, each for 10-14 days.[6]



CASE CONCLUSION

The patient was diagnosed with tertiary syphilis with CSF VDRL that was positive in the hospital and continued on IV penicillin. During his hospital stay, he was also found to have chlamydia and subsequently completed a course of doxycycline. ✶

References available online.

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Is That Really What They Want?

Ways Your Code Status Conversations can Make or Break Getting to the Heart of a Patient's Care Goals

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Delivering serious news and exploring a patient's wishes during a medical crisis are among the most challenging things we do as emergency physicians.

As a palliative care and EM physician, I frequently have these types of conversations with patients and families, both in the rapid context of ED care and in methodical detail as an inpatient palliative consultant. Despite our best intentions when approaching a patient or their family, subtle aspects of our communication can dramatically influence these conversations and our conclusions regarding the patient's care. These conversations are essential in providing appropriate acute care in the context of a patient's overall goals and can be tremendously beneficial, even in the limited time available for discussions and decision-making in a busy ED.

The following pearls, based on strategies described in medical communication literature and applicable in a variety of situations, can aid effective and time-sensitive ED goals-of-care discussions. In an ideal world, we would have ample time to make decisions and conduct thorough and exclusively face-to-face conversations. Unfortunately, in the ED, we have to balance time sensitivity with the goal to provide critical care in line with patients' wishes. Therefore, strategies are described that foster improved communication within the context of these constraints.

References available online.

PEARL #1: IF POSSIBLE, DIVE INTO THE CHART BEFORE DIVING INTO THE CONVERSATION.

Sometimes a quick chart dive is not possible (e.g., when patients are registered under an alternative ID for emergency purposes). However, when feasible, even a brief moment of review can be extremely helpful. A review can provide information such as getting a sense for whom the immediate next-of-kin may be, whether there is any prior documented code status, or if there is an advanced directive on file such as a Physician Orders for Life-Sustaining Treatment (POLST) form or an equivalent type of form. This is especially important for patients coming from care facilities, as they may have prior documentation of their wishes and relatives may not be immediately available or aware that the patient has been sent to the ED.

PEARL #2: GIVE A WARNING SHOT BEFORE GIVING BAD NEWS.

Keep in mind that, for us, the chaos of the ED and the potential for patients to suffer a life-altering or life-ending event are routine. However, for most of our patients and their families, this is the worst day imaginable. As obvious as it may be to us that a patient is critically ill, a patient's family or loved ones may not be as aware of the situation's seriousness. A warning shot before giving them details can be extremely helpful, as a mind braced for bad news is more likely to hear it compared to someone who is completely blindsided.

PEARL #3: ENSURE YOU HAVE THE RIGHT PEOPLE AND THE RIGHT PLACE.

Sometimes we truly can't get a hold of anyone else, but keep in mind that the person standing nearby may not be the only — or even the primary — person who should be aware of what's going on, is able to speak for the patient, or can help with decisions. There also may be strong feelings about whether to discuss serious issues in front of a disoriented or unconscious patient.

Sometimes taking a moment for a brief assessment of who's there and who needs to be aware of what's going on can be combined with a warning shot to promptly set up a conversation for success: "Hello, I'm Dr. Jones. I need to discuss Mrs. Smith's condition. How are you connected with/related to Mrs. Smith?... Unfortunately, I am very concerned about Mrs. Smith right now, and I need to discuss her condition further. Would that be okay, and is there anyone else with you here who should be involved in our discussion, or whom we need to include on the phone?"

Ideally, conversations occur in person, but unfortunately, we may only have minutes to determine next steps. Offering to include an essential person by phone allows for their involvement while also emphasizing the time urgency of the situation. Often, in urgent ED goals-of-care discussion scenarios, the patient is too ill to participate in the conversation. If another space is available to talk with your decision-maker, see if that is preferred over speaking in front of the patient, if the patient is unable to participate.

PEARL #4: GIVE THE BIG PICTURE AND KEEP IT VERY SIMPLE.

In the medical field, we are used to conveying complex and comprehensive medical information in brief verbal summaries. This does not work well when communicating with families or loved ones in regards to very ill patients. They are more likely to get lost in the depth of details we provide rather than seeing the big picture, so that is what we need to give them. "Your mother has developed bleeding inside her brain, which is extremely serious, and I'm even concerned that she may not survive this." They will ask for more specific information as they are ready, but often the big picture of the problem can get lost in conversations full of jargon. With a straightforward statement, they immediately are on the same big-picture page, and that becomes the context for the remaining details of the discussion.

PEARL #5: ASK THEM ABOUT THE PERSON, NOT THE PROCEDURES.

Along with providing too much medical jargon and details, it is easy to move directly to questions about choosing a particular intervention or procedure. Understanding the patient and their goals is necessary before it is clear which course of action will make sense in each case. Ask about how the patient has been doing prior to their acute event. Some may have been functioning independently beforehand. Others may not have, and their acute illness may be coming on the heels of a long decline, which can affect how decision-makers feel about their present condition.

Ask about prior conversations regarding serious illness and what the patient may have previously stated they would want if they were seriously ill. Did they ever discuss their opinions on life-support measures or other aspects of care if they were to become seriously ill? Was there anything in their life of particular importance, such as their independence, mobility, mental capacity, being able to participate in a specific activity, spending time with friends and family, etc.?

PEARL #6: BRIEFLY OUTLINE THEIR OPTIONS.

Instead of running through a laundry list of options, try to distill down potential courses of action in basic terms and outline two or, at most, three. For example, in a seriously ill patient with a life-threatening event, the treatment could be potentially invasive life-sustaining care versus comfort measures, if a middle ground approach isn't feasible. In many cases, such as a patient with septic shock, care could range from full code to limited interventions, to comfort measures.

Medical decision-makers want to ensure that "help" is provided to the patient, but what constitutes help will vary across the continuum of illness, and it is up to the medical team to help define what may be beneficial in a given context. Some treatments — such as aggressive life-support measures in patients with advanced terminal illness — may represent a greater burden than benefit. In many cases, however, beneficial and life-prolonging treatments can still be provided while simultaneously avoiding the initiation of measures that merely temporize the dying process without moving patients closer toward a longer-

References available online.

term recovery.

PEARL #7: DETERMINE WHAT OPTIONS MIGHT FIT OR NOT FIT WITH THE PATIENT'S DESIRES.

Describe the likely outcomes of a particular course of action, and see if the potential outcomes of a course of treatment would conflict with a patient's underlying goals. For example: "It's possible that your mother may survive this depending on what we do next, but it's also very likely that her condition is going to be very different if she survives. I suspect that she would likely need long-term nursing care, potentially for the rest of her life, and she will likely not be able to do many of the things she was able to do previously."

Reference specific items of importance from learning about the patient, which may be relevant to medical decision-making. For example, some patients are adamant about not wanting to lose function to the degree that they would require long-term nursing care. Determining if the expected trajectory of different care options may lead to unacceptable outcomes is essential in providing goal-aligned care.

PEARL #8: MAKE RECOMMENDATIONS THAT ALIGN MEDICAL OPTIONS WITH THE PATIENT'S GOALS AND VALUES.

Based on the discussion, recommend a course of action that seems to fit best with the patient's condition and previously expressed care goals. It can be helpful to emphasize that all decisions at this point are difficult, so it's not about deciding on something that feels like a wonderful choice, but to determine the best decision in the interests of the patient for a difficult situation. For example, if a patient expressed a desire to live longer but also expressed a desire to avoid life support or similar measures, it may be reasonable to suggest treatments that could be useful to address the acute issue, while simultaneously setting limits on what happens if the patient's condition deteriorates. For example: "Based on what you told me about your father, I think it would make sense to start him on antibiotics for his infection to see if he can get better. At the same time, it sounds like he did not want to be on life support if he ever became very ill, and he would not want to live through a serious illness if it rendered him unable to care for himself independently. If he continues to get worse while he is in the hospital to the point that his heart or breathing stopped, he would not only need CPR, but he would also likely be on life support for at least a period of time. I would expect that his condition, if he recovered, would be serious enough to require long-term nursing care. In this case, I think it would make more sense to do the things that we think may get him better, such as IV medications and fluids, while also not initiating interventions that may go beyond what he would want, such as putting him on

References available online.

a breathing machine or starting chest compressions if his heart stops. I am hopeful that the treatments we can offer him will help, and if they do not, it would make sense to consider potentially focusing on his comfort and aggressively treating any distressing symptoms he may be experiencing, rather than starting interventions he would not want and would not likely get him to a condition he would find acceptable."

PEARL #9: PROVIDE SUPPORT TO THE DECISION-MAKER.

Substituted judgment is the process of a decision-maker articulating the decision of another, rather than making the decision themselves. It is helpful to ask a decision-maker to tell you what they think the patient would want, or what they would say under a given circumstance if they could be involved in the discussion. This helps to offload the weight of potential guilt the decision-maker may have in the situation, while achieving the ultimate aim of treatment in accordance with the patient's wishes.

Regardless of decisions made, acknowledge the importance of the decision-maker's help to the care team on behalf of the patient. Also thank them for the effort needed to engage in difficult conversations. Highlight the goal of following the patient's wishes to clarify the necessity of such discussions and help prime the decision-maker for future conversations regarding the patient's ongoing care.

There are countless ways to conduct difficult discussions in the ED. The information and examples above can help you align your care with a patient's wishes, and can help you provide guidance to families and loved ones who need details about an acute illness translated into layman's terms. Such discussions can be extremely difficult and stressful, but you may also find it incredibly rewarding to help families dealing with these difficult decisions. Your sincere effort to show regard for what is important to the patient and their family can be tremendously impactful, regardless of the outcome of the conversation or the illness involved. ✶

PEARLS

The pearls in this article are outlined in the mnemonic AID GOALS: alert, invite, describe, goals, options, acceptable outcomes, lead, and support. This is available in a mobile format for easy reference at PalliEM.org.

Pearl #1: If possible, dive into the chart before diving into the conversation.

Pearl #2: Give a warning shot before giving bad news.

Pearl #3: Ensure you have the right people and the right place.

Pearl #4: Give the big picture and keep it very simple.

Pearl #5: Ask them about the person, not the procedures.

Pearl #6: Briefly outline their options.

Pearl #7: Determine what options might fit or not fit with the patient's desires.

Pearl #8: Make recommendations that align medical options with the patient's goals and values.

Pearl #9: Provide support to the decision-maker.

ADDITIONAL RESOURCES

Additional resources are listed below to provide further guidance on dealing with serious illness conversations in the ED.

- "Managing Code Status Conversations for Seriously Ill Older Adults in Respiratory Failure" by Ouchi K, Lawton AJ, Bowman J, Bernacki R, and George N, published in Annals of Emergency Medicine.
- "United States Best Practice Guidelines for Primary Palliative Care in the Emergency Department" by Loffredo AJ, Chan GK, and Wang DH, et al, published in Annals of Emergency Medicine.
- EPEC: Education in Palliative and End-of-Life Care. Northwestern Medicine Northwestern University Feinberg School of Medicine. https://www.bioethics.northwestern.edu/programs/epec/
- VitalTalk Evidence-Based Communication Trainings. VitalTalk.org. https://www.vitaltalk.org/resources/
- "PalliEM Pocket Pals: Goals of Care" by Brooten J and Markwalter D, on PalliEM.org. https://palliem.org/home/palliem-pocket-pals-goals-of-care/
- "PalliEM 5 Minute Consult: AID GOALS – Goals of Care Discussion Guide" by Brooten J and Markwalter D, on PalliEM.org. https://palliem.org/home/palliem-5-minute-consult-aid-goals/

References available online.

Post-Intubation Sedation in the ED: The Basics

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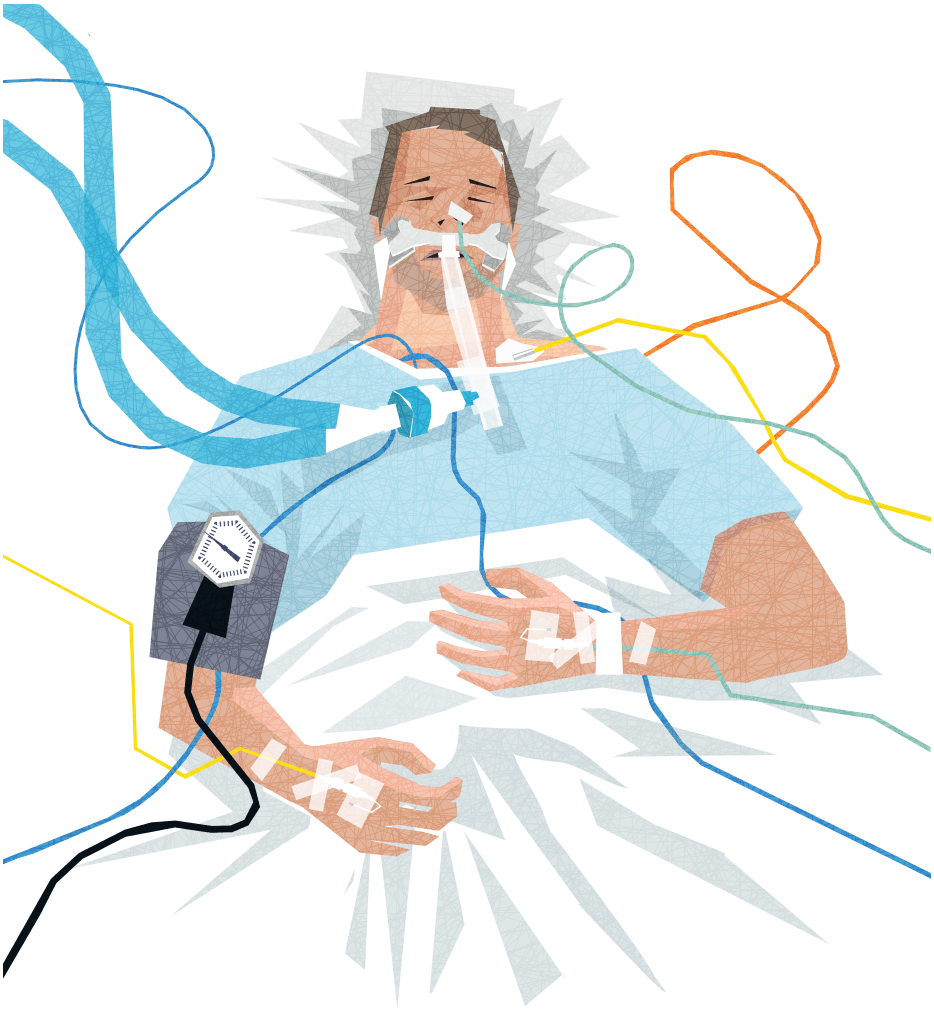

Emergent intubation requires critical thinking and precision. The same level of care should be extended to managing post-intubation sedation. This paper explores the most commonly used analgesics and sedatives and examines how to pick the best post-intubation strategy for your patient.

Preparing for and performing an emergent intubation in the emergency department requires critical thinking and precision. Once the endotracheal tube is secured and the stress of impending respiratory failure subsides, the post-intubation period may seem trivial. However, there is a growing body of literature demonstrating the importance of post-intubation care in the ED. It is therefore imperative that emergency physicians be adept at managing the sedation and analgesic needs of intubated patients in the ED.

Post-intubation care has been shown to have a major impact on hospital mortality and length of stay. As demonstrated in the 2012 SPICE trial, deep early sedation within the first four hours of intubation was found to be an independent predictor for delayed extubation and increased hospital mortality.[1] Oversedation has also been shown to increase length of ICU stay.[2] Various studies have demonstrated the negative effects of prolonged deep sedation, including increased incidence of hospital delirium and higher six-month mortality.[3]

The Richmond Agitation-Sedation Scale (RASS) is the most widely used tool in the ICU setting to objectively characterize the depth of sedation in the mechanically ventilated and critically ill patient. For patients who do not require deep sedation (e.g., patients receiving neuromuscular blockade, open abdomens, status epilepticus, etc.) the goal is to titrate analgesia and sedation to a RASS between -1 to 0.[4] In a cohort study of mechanically ventilated patients, a majority of patients (64 percent) were overly sedated in the ED with a median RASS of -3.[1] The Society of Critical Care Medicine (SCCM) guidelines recommend an "analgesia-first sedation" approach when managing sedation needs of the mechanically ventilated patients. This is

References available online.

the concept of optimizing pain control prior to implementation of sedation medications. The overall goal is to minimize pain while keeping the patient at a light sedation.

Analgesic treatment should be started immediately post-intubation, as patients treated with long-acting paralytics are unable to exhibit signs of discomfort. The two most common neuromuscular blocking agents used during rapid sequence intubation (RSI) are rocuronium and succinylcholine. Although both produce a similar paralytic effect, their durations of action are markedly different. Succinylcholine typically lasts 4-6 minutes, and rocuronium lasts an average of 30-90 minutes, depending on dosage used.[6] In contrast, sedatives used in RSI have a much shorter duration of action. For example, etomidate is a commonly used sedative that has a duration of action lasting only 3-5 minutes.[5] This can unfortunately create a situation where a patient remains paralyzed without receiving adequate analgesia and sedation.

This paper explores the most commonly used analgesics and sedatives and examines how to pick the best post-intubation strategy for your patient.

Analgesic Summary Table

	MECHANISM	INFUSION DOSING	PRO	CON
Fentanyl	Synthetic Mμ selective opioid agonist	25–500 mcg/hr	• Rapid onset • No histamine release • Good in ESRD patients	• Risk of exacerbating serotonin syndrome
Morphine	Mμ selective opioid agonist	2–30 mg/hr	• Has a longer half life (may be better suited as bolus dosing)	• Histamine release can lead to vasodilation • Caution in patients with ESRD
Hydromorphone	Mμ selective opioid agonist	0.4–4 mg/hr	• Good option with opioid-tolerant patients	• Caution in patients with concurrent psychiatric disease as it is euphorigenic
Ketamine	NMDA receptor antagonist	1–5 mg/kg/hr	• Good options for patients with hypotension • Useful for status asthmaticus	• Use cautiously in patients with severe liver dysfunction • Avoid in patients with TBI
Remifentanil	Ultra-short-acting synthetic mu-opioid receptor agonist	0.25–0.5 mcg/kg/min	• Does not accumulate in organ failure • Useful for peri-extubation period	

HOW TO CHOOSE A SEDATION STRATEGY

A few pearls when picking your sedation strategy:

- RASS targets may vary depending on clinical indication for sedation. Determine your post-intubation RASS goal while preparing for intubation.
- While preparing medications for intubation, discuss post-intubation analgesia and sedation with the bedside nurses/pharmacist, and have analgesia and sedation ready to be started post-intubation.
- Recheck your patient's level of sedation at 30 minutes, 60 minutes, and 90 minutes afterward to determine if any changes are necessary.
- Prepare a plan for breakthrough pain and agitation post-intubation, and talk to the bedside nurse about it. Consider ordering as-needed medications after intubation to prevent delays in patient care.
- Place soft restraints on patients after intubation as a precautionary measure while titrating analgesia and sedation.

ANALGESICS

Fentanyl

Common dosages
- Bolus: 50-100 mcg q30-60min
- Infusion: 25-100 mcg/hr

Mechanism
- Synthetic Mu-selective opioid agonist (but can potentially activate delta and kappa-receptors)
- 50-100x more potent analgesia when compared to morphine
- Increased dopamine transmission
- Low affinity for postsynaptic 5-HT1A and 2A serotonin receptors
- Metabolized hepatically via the CYP450 system with 3-7 hour half-life
- Highly lipophilic

Pros
- Rapid onset, which allows for rapid dose titration
- No histamine release, therefore less hemodynamically disruptive
- No toxic metabolites that accumulate in cases of renal failure

Cons
- Constipation
- Respiratory depression
- Accumulates in fat, causing delayed awakening due to increased half-life
- Be wary of patients on CYP450 inhibitors or inducers as that can affect metabolism

Cautions
- Patients with liver failure: can be used, but cautiously as metabolism is prolonged
- Patients with gastrointestinal obstruction: may compound gut motility issues
- Patients actively in serotonin syndrome: avoid completely

Morphine

Common dosages
- Bolus: 4-8 mg q1-2hr
- Infusion: 2-30 mg/hr

Mechanism
- Mu-selective opioid agonist (but can potentially activate delta and kappa-receptors)

References available online.

- Glucuronidation to two metabolites in the liver
  - Morphine-6-glucuronide (M6G)
    - A μ-opioid agonist
  - Morphine-3-glucuronide (M3G)
    - No analgesic effect

Pros
- Longer half-life than other opioid agents
- Less euphoria with decreased abuse/addiction potential

Cons
- Histamine release can lead to pruritus and vasodilation (can contribute more to hypotension and bradycardia)
- Constipation
- Respiratory depression

Cautions
- Patients with liver failure: can be used, but cautiously as metabolism is prolonged
- Patients with gastrointestinal obstruction: may compound gut motility issues
- Avoid in patients with renal failure
- Avoid in patients with concurrent use of monoamine oxidase inhibitors (MAOIs): can lead to hypotension, serotonin syndrome, increased respiratory depression

Hydromorphone

Common dosages
- Bolus: 0.4-1 mg q1-2hr
- Infusion: 0.4-4 mg/hr

Mechanism
- Mu-selective opioid agonist (but can potentially activate delta and kappa-receptors)
- Glucuronidation to hydromorphone-3-glucuronide in the liver (no analgesic effect)

Pros
- Longer half-life than fentanyl
- An effective option in patients tolerant of morphine or fentanyl

Cons
- Very euphorigenic and can lead to inappropriate use for anxiety or agitation
- Constipation
- Respiratory depression

Cautions
- Patients with liver failure: can be used, but cautiously as metabolism is prolonged
- Patients with gastrointestinal obstruction: may compound gut motility issues
- Patients with renal failure: cautiously monitor as HM3G can accumulate and cause seizure, myoclonus, or agitation

Remifentanil

Common dosages
- Bolus: 0.5-1 mcg/kg q2-5min
- Infusion: 0.25-0.5 mcg/kg/min

Mechanism
- Ultra-short-acting synthetic mu-opioid receptor agonist

Pros
- Organ-independent metabolism (widespread extravascular metabolism by extrahepatic, nonspecific blood and tissue esterases)
- Rapid offset of action
  - Allows for fast and predictable extubation

Cons
- Constipation

Cautions
- Patients with gastrointestinal obstruction: may compound gut motility issues
- Not widely available for use outside of the operating room

Ketamine

Common dosages
- Bolus: 0.25 to 0.5mg/kg
- Infusion: 1-5mg/kg/hr

Mechanism
- NMDA antagonist (receptor for glutamate - the primary excitatory neurotransmitter of the brain)
- Hepatic metabolism

Pros
- Hemodynamically stable drug, although may cause mild elevation in blood pressure at higher doses
- Bronchodilator, may be helpful in status asthmaticus
- Anticonvulsant properties
- Amnestic
- Treats agitation refractory to other drugs

Cons
- Hypertension
- Bronchorrhea
- Re-emergent phenomenon

Cautions
- Patients with uncontrolled hypertension
- Pregnant patients
- Severe liver dysfunction
- Active psychosis or delirium
- Avoid in patients with traumatic

References available online.

Sedatives Summary Table

	MECHANISM	INFUSION DOSING	PRO	CON
Propofol	Exact mechanism of action unknown	5–50 mcg/kg/min IV, titrate in 5 mcg/kg/min increments to goal	• Rapid onset • Rapid offset	• Hypotension • Hypertriglyceridemia • Propofol Infusion Syndrome
Dexmedetomidine	Alpha-2 agonist	0.2–1.5 mcg/kg/hr	• Minimal respiratory depression • Can use in non-intubated patients	• Hypotension • Bradycardia
Midazolam	Binds to GABA-A receptor complex	Loading dose: 0.01–0.05 mg/kg (0.5–4 mg) Infusion: 0.02–0.1 mg/kg/hr Intermittent bolus doses of 0.5–4 mg	• Dose-dependent • No hemodynamic effect • Immediate onset • Short duration • Treatment for seizures and alcohol withdrawal • Amnestic effects	• Prolonged sedation, increases delirium • Paradoxical agitation • Withdrawal potential
Lorazepam	Binds to GABA-A receptor complex	Loading dose: 0.02-0.04 mg/kg (1–2 mg) Infusion: 0.01–0.1 mg/kg/hr (max < 10 mg/hr) Maintenance bolus: 0.92–0.06 mg/kg q2-6hrs (1-4 mg)	• Long-term sedation • Can use in patients with mild to moderate hepatic and renal impairment • Treatment for seizures, alcohol	• Propylene glycol toxicity • Respiratory depression • Delirium • Slow onset • Prolonged sedation • Risk for PTSD • Paradoxical agitation, withdrawal potential
Diazepam	Binds to GABA-A receptor complex, specific allosteric binding in the limbic system, and binds to a2 receptors in the spinal cord	Loading dose: 0.05–0.2 mg/kg (5–10 mg) Continuous infusion not recommended Maintenance dose: 0.03–0.1 mg/kg every 0.5–6 hrs	• Rapid onset • Muscle relaxant • Treatment for seizures and alcohol withdrawal • Amnestic effects	• Respiratory depression • Delirium • Propylene glycol toxicity • Prolonged sedation • Risk of dependence • Prolonged duration for patients with renal repair • Risk for PTSD • Paradoxical agitation, withdrawal potential

brain injuries - increases intracranial pressure

SEDATIVES

Propofol

Common dosages

- Bolus: Generally not recommended, but can consider giving 10-20 mg boluses based on hemodynamic stability
- Infusion: 5-50 mcg/kg/min IV, titrate in 5-10 mcg/kg/min increments

Mechanism

- Exact mechanism of action unknown
- Effects the GABA-mediated chloride channels in the brain. Decreases the dissociation of GABA from receptors resulting in hyper-polarization of the membrane, decreasing further successful action potentials.

Pros

- Rapid onset and offset of action - use for short procedures, patients that require frequent neurological assessment
- Shown to have a lower mortality, earlier discharge, and earlier discontinuation from mechanical ventilation compared with midazolam and lorazepam[10]
- Anticonvulsant properties
- Bronchodilator
- Patients do not typically develop tolerance or withdrawal
- Treats alcohol withdrawal

Cautions

- Use caution with patients with depressed blood pressures, albeit can augment with vasopressor support
- Use caution with patients with pulmonary hypertension
- Avoid in patients with severe heart failure, heart block, and bradycardia

Dexmedetomidine

Common dosage

- Infusion: 0.2-1.5 mcg/kg/hr

Mechanism

- Alpha-agonist with preferential alpha-2 receptor selectivity of 1600 to 1
- Activates presynaptic alpha-2 receptors in the brainstem which provide negative feedback for neurotransmitter release
- Mechanism on peripheral nerves (peripheral nerve block) unknown but suspected to be perineural

Pros

- Provides sedation and without significant respiratory depression. Can be used in patients who are not intubated (e.g., NIPPV).
- Provides sedation and anxiolysis that improves patient comfort and allows patient cooperation (e.g., agitated patients, patients being weaned from mechanical ventilation

Cons

- May precipitate and exacerbate hypotension and bradycardia
- Prolonged use may cause tolerance and precipitate withdrawal if suddenly discontinued. May transition to oral clonidine.
- Difficult to provide deep sedation (RASS < -2)

Cautions

- Use caution for patients with depressed blood pressures, albeit can augment with vasopressor support
- Use caution with patients with pulmonary hypertension
- Avoid in patients with severe heart failure, heart block, and bradycardia

Note: Use of benzodiazepines for sedation in patients in the ICU has been shown to exacerbate ICU delirium and increase mortality.[20] However, benzodiazepines should be used judiciously and are utilized in specific patient populations (e.g., treatment of alcohol withdrawal syndrome, status epilepticus).

Midazolam

Common dosages

- Loading dose: 0.01 to 0.05 mg/kg

References available online.

SCORE	TERM	DESCRIPTION
+4	Combative	Overtly combative or violent ➔ **IMMEDIATE DANGER TO STAFF**
+3	Very agitated	Pulls on or removes tubes/catheters ➔ Aggressive behavior toward staff
+2	Agitated	Frequent nonpurposeful movement or patient-ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert; sustained (>10 seconds) awakening, eye contact to voice
-2	Light sedation	Briefly (<10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice
-4	Deep sedation	No response to voice, any movement to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

Sessler C, Gosnell M, Grap MJ, et al. The Richmond agitation-sedation scale. Validity and reliability in adult intensive care unit patients. *Am J Respir Crit Care Med.* 2002;166:1338.

(0.5 to 4 mg)
- Maintenance infusion rate: 0.02 to 0.1 mg/kg/hr
- Intermittent bolus dose: 0.5 - 4 mg

Mechanism
- Binds to GABA-A receptor complex inducing conformational change in chloride channel. Enhances chloride channel opening frequency resulting in neuronal inhibition.
- Acts on glycine receptors and produces a muscle-relaxing effect
- Onset: 2-5 min
- Duration: 1-4 hrs

Pros
- Dose-dependent, hemodynamically stable medication
- Immediate onset of action
- Anticonvulsant properties
- Amnestic
- Treats alcohol withdrawal syndrome and sympathomimetic intoxication (i.e., cocaine)

Cons
- Metabolizes to active metabolites which may cause prolonged sedation
- Deliriogenic
- Risk factor for post-traumatic stress disorder
- May cause paradoxical agitation
- Prone to causing withdrawal

Cautions
- Use caution with elderly patients, due to risk of delirium

Lorazepam

Common dosages
- Loading dose: 0.02-0.04 mg/kg (1-2 mg)
- Maintenance bolus: 0.92 - 0.06 mg/kg q2-6hrs (1-4 mg)
- Infusion rate: 0.01-0.1 mg/kg/hr (max less than 10 mg/hr)

Mechanism
- Binds to GABA-A receptor complex inducing conformational change in chloride channel. Enhances chloride-channel opening frequency resulting in neuronal inhibition
- Onset: 15-20 min
- Duration 6-8 hrs

Pros
- Relatively safe in patients with mild to moderate hepatic and renal impairment
- Anticonvulsant properties
- Amnestic
- Treats alcohol withdrawal syndrome and sympathomimetic intoxication (i.e., cocaine)

Cons
- Propylene glycol toxicity
- Deliriogenic
- Relatively slow onset
- Risk of prolonged sedation
- Risk factor for post-traumatic stress disorder
- May cause paradoxical agitation
- Prone to causing withdrawal

Cautions
- Use caution with elderly patients, due to risk of delirium

Diazepam

Common dosages
- Loading dose: 0.05-0.2 mg/kg (5-10 mg)
- Maintenance dose: 0.03-0.1 mg/kg every 0.5-6 hrs
- Continuous infusion not recommended

Mechanism
- Binds to GABA-A receptor complex inducing conformational change in chloride channel. Enhances chloride channel opening frequency resulting in neuronal inhibition.
- sAdditional specific allosteric binding in the limbic system
- Binds to alpha-2 receptors in the spinal cord
- Onset: IV 2-5 min
- Duration: 20-60 min

Pros
- Rapid onset
- Muscle-relaxant
- Anticonvulsant properties
- Amnestic
- Treats alcohol withdrawal syndrome and sympathomimetic intoxication (i.e., cocaine)

Cons
- Deliriogenic
- Propylene glycol toxicity
- Risk of prolonged sedation
- May cause increased prolonged duration for patients with renal impairment
- Risk factor for post-traumatic stress disorder
- May cause paradoxical agitation
- Prone to causing withdrawal

Cautions
- Not typically used in critically ill patients
- Use caution with elderly patients, due to risk of delirium ✶

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References available online.

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The Dangers of Delta-8

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Marijuana, THC (tetrahydrocannabinol), and CBD (cannabidiol) products are becoming increasingly popularized and legalized in our society. With the proliferation of these products' use also comes accidental ingestion and fraudulent product distribution. In the new world of synthetic and man-made illicit substances, emergency physicians truly need to be more astute than ever to properly diagnose, treat, and educate their patients.

Marijuana, THC (tetrahydrocannabinol), and CBD (cannabidiol) products are becoming increasingly popularized and legalized in our society. With the proliferation of these products' use also comes accidental ingestion and fraudulent product distribution.

Types of THCs widely used are THC-A, THC-V, Delta-8 THC, and Delta-9 THC (most common form). All these variations have different intended effects when ingested and have different natural concentrations in the cannabis sativa plant. Delta-8 THC and Delta-9 THCs' effects include euphoria (feeling "high"), relaxation, and pain relief by binding to the cannabinoid receptor (CB1). These effects are highly desired by cannabis consumers. Delta-9 THC is in higher concentration than Delta-8 THC in naturally grown cannabis. However, hemp-derived CBD can be manufactured to isolate and concentrate Delta-8 THC.[1] This manufacturing process can be dangerous, and emergency physicians need to know the risks this substance poses.

Because these Delta-8 THC products are synthesized from hemp products and not the cannabis plant, they can be manufactured and sold in states where marijuana is still illegal. The 2018 Farm Bill legalized hemp products containing less than 0.3% Delta-9 THC. This means

References available online.

there is ambiguity at the federal level for products containing higher amounts of Delta-8 THC, as long as they don't have more than 0.3% Delta-9 THC based on dry weight. It is claimed that Delta-8 THC is legal at the federal level due to this chemical loophole.[2] Manufacturers have become savvy in that they can synthesize hemp with the maximum legal amount of Delta-9 THC and dramatically increase the amount of Delta-8 THC. This makes for a product that has very potent effects. Manufacturers can also isolate Delta-8 THC and make very potent products, as there are no laws limiting the quantity of Delta-8 THC a product can have. The Drug Enforcement Administration (DEA) has proposed a new rule to indirectly classify Delta-8 THC as a Schedule 1 drug, which would make it illegal. This has yet to be finalized.[1]

According to the U.S. Cannabis Council, manufacturing of Delta-8 THC can occur in uncontrolled or unsanitary settings, which leads to potential contamination. Some contaminants include other cannabinoids, Delta-9 THC, heavy metals, lead, and mercury.[3] These Delta-8 THC products can be purchased easily online or in gas stations where the age limits on products may not be fully enforced. Delta-8 THC is also packaged into candies, brownies, and gummies where the final colors can be made from unsafe household chemicals.[3] These treats look innocent and enticing to children and pets, which leads to accidental ingestion and overdose. These Delta-8 THC products can cause tachycardia, anxiety, dizziness, vomiting, hallucinations, discoordination, memory loss, delayed reaction time, loss of consciousness, or even death. Additional research is needed to determine long-term health consequences of these products.

Emergency physicians should be aware of many things regarding Delta-8 THC.

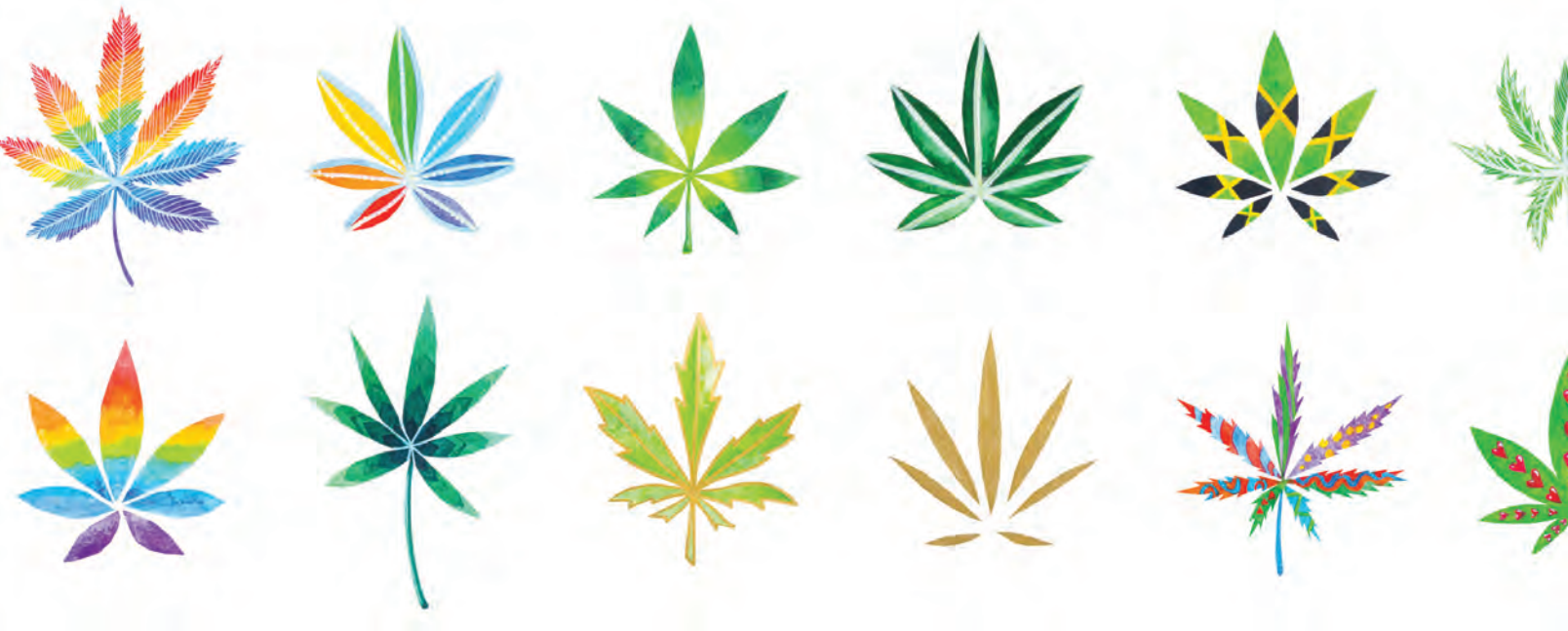
Delta-8 THC has not been evaluated or approved by the Food and Drug Administration (FDA). For this reason, varying amounts of the substance may be present in a product being purchased. Some products are labeled as therapeutic or medicinal. This is entirely unsubstantiated by any research or data and is problematic for many reasons. People who prefer homeopathic remedies for serious diseases may choose to use these non-FDA-approved products instead of prescribed pharmaceuticals, which puts them at risk of morbidity or mortality from their disease. This deceptive marketing is illegal and a public health crisis.

Emergency physicians should be aware of many things regarding Delta-8 THC. Cannabis detected in a standard urine drug screen looks for Delta-9 THC. Delta-8 THC by itself will not generate a positive UDS. It is also indeterminate how long Delta-8 THC remains in urine, hair, or blood for analysis.

Also, emergency physicians need to be aware of Delta-8 THC when assessing an undifferentiated comatose patient. According to the National Poison Control Center, there were 2,362 Delta-8 THC exposures between Jan. 1, 2021, and Feb. 28, 2022. Of these exposures, 40% were unintentional ingestions. Of those, 82% were in the pediatric population. Eight percent required admission to a critical care unit. In one pediatric case, the patient coded and died.[3]

In the new world of synthetic and man-made illicit substances, emergency physicians truly need to be more astute than ever to properly diagnose, treat, and educate their patients. ✶

*To learn even more about Delta-8 THC, head over to EMRA*Cast for Dr. Brittany Ladson's podcast interview with Dr. Kyle Duke.*



References available online.

Advice to Senior EM Residents (Actually, *all* Residents and Fellows)

Gus M. Garmel, MD, FACEP, FAAEM
Adjunct Professor of Emergency Medicine, Stanford University Department of EM
Former Co-Program Director, Stanford/Kaiser EM Residency
Faculty Advisor, Embark: Career Planning, EMRA.org

TO SENIOR RESIDENTS IN EM:

Congratulations on making it to your final year of training! This is certain to be an exciting time. It will also be challenging and stressful. Never forget that the work you do is important to the lives, health, and wellness of so many people, their families, and friends.

There is a great deal to learn and to crystallize during your final year of training, whether you are in your third or fourth year of residency, or in fellowship. To assist with your transition, I share several observations and describe five actions that can increase the likelihood of your success and happiness. There will also be a tremendous amount of information to process after graduating, some of which I address. As much of this information is universal, it will have value for medical students, interns, residents at any stage of training in any discipline, fellows, and junior faculty. A commitment to lifelong learning in health care (especially in EM) has never been more imperative.

Given how changes in the EM landscape are continuous and rapid, my first suggestion is to be present and pay attention. Be present in your interactions with your patients and colleagues. Pay attention to the political climate in EM (at national and state levels), to organizations in EM, and to the business of EM (nationally and locally). Give intentional attention to these areas, in addition to scientific advances in our field. This knowledge will prove relevant throughout your career, which, despite its challenges, will hopefully be productive, lengthy, and satisfying. As the safety net for health care and for the public, the demands placed on EM and EPs are difficult to meet. Attention to these challenges increased during the pandemic, when the general public and public officials correctly labeled first responders and emergency personnel as "heroes." Sadly, much of this favorable attention has waned. However, an

References available online.

important opportunity remains for us to rebrand ourselves and our specialty, of which we should take advantage.[1]
Given EM's intersection with so many stakeholders, my next suggestion is to become familiar with the individuals and organizations that influence your career. For EM to thrive while continuing to provide the best possible care to anyone, at any time, for any reason,[2] hospital and political leaders (with our input and assistance) must focus their efforts on improving key elements of EM practice. These include, but are not limited to, soaring boarding rates,[3,4] lengthy admission times, limited bed availability (in the ED and the hospital), problems impacting ED throughput and efficiency, lack of specialty consultant access, widespread and escalating workplace violence,[5,6] increasing mental and substance use-related illnesses, and the difficulties our patients face scheduling necessary follow-up care. Interhospital relationships and relations with EM and non-EM colleagues, as well as respect for EM within hospital systems, are fundamental to personal and overall success. These relationships must be valued and reinforced. When they are strong, individual EPs and EDs tend to receive greater support from the medical and administrative staff. Our patients, their families, and members of the community also have an important role. They should be encouraged to share their stories with administrators and politicians, through letters, phone calls, surveys, or on social media.

Additional internal and external influences to give careful attention include inherent nuances of the ED and the hospital where you work. Clinical and administrative support in EM and in the ED, as well as diversity, equity, and fairness, are significant factors to consider during your transition to attending staff. Hiring and promotion practices, advancement opportunities, objective pay, equitable scheduling, staffing, and assignments or responsibilities that include activities unrelated to direct patient care greatly impact your work environment. Changes in the leadership of EDs, ED groups, and hospitals relate to income and job security, which may produce stress and anxiety, which likely impact career satisfaction. The corporatization of EM,[7,8] hospital and/or group consolidations, health-care worker burnout and attrition, and workplace safety are getting national notice. Fortunately for EM, national fee structures have started to increase, and surprise billing has received political attention as well. My hope is that attention to these vital aspects of EM will translate to enhanced health-care outcomes for patients, consistently excellent patient care experiences in better ED environments, upgraded safety for everyone in the ED, increased job security, more EM positions, and improved career satisfaction.

Given my expertise with and passion for career planning[9] and mentoring,[10,11] I'd like to share **five major areas** which often create problems for graduates in their new positions. Consider these during your final year of training and strive to further develop them. Seek guidance in these areas while EM faculty at your program are available to assist you.

1. **Conflict resolution/conflict management** (i.e., interpersonal relations) — How well or how poorly do you handle a disagreement or conflict with a patient, family member, colleague, consultant, tech, nurse, director, or administrator? How does your ability to handle conflict impact your responsibility serving as your patients' advocate? How skillfully can you handle a disagreement with a colleague or consultant that directly relates to patient care (for example, disagreeing with their clinical recommendation after you've sought their opinion)? How healthy are your pre-existing relationships, and how well do you establish new (first-time) relationships, particularly during an intense or time-sensitive moment? How well do you negotiate? How well do you "play" with others in the health-care "sandbox"? Communication is key, including verbal and nonverbal (such as body posture, positioning, and gaze), writing or messaging, active listening, and collaborating. EM textbook chapters on conflict resolution and conflict management offer additional background and much-needed tools.[12,13]

2. **Efficiency** — Metrics matter to many people, particularly administrators and hospital leaders.[14] I strongly recommend that you find out which tool and/or company is used for patient satisfaction surveys as early as possible, including the logistics surrounding their delivery and statistical analysis. It is also important to identify which other metrics are measured at your new facility and ED. Commonly collected, monitored, and used metrics include physician time to patient, time to disposition, patient complaints, number of return visits (even though this may be positive due to detailed discharge instructions that are followed), number of labs or imaging tests ordered, number and "appropriateness" of consultants called (which may have nothing to do with your clinical skills), and number or percentage of patients admitted. To some extent, these metrics relate to efficiency and throughput, as does the metric of how frequently the ED "backs up" when you are working (often a gestalt made by others, such as a charge nurse, which may also have nothing to do with your skills). These metrics and perceptions answer the question, "How smoothly does the ED run while you are working?" Hospital administrators and ED leaders pay attention to this and to any patterns that emerge.

3. **Billing/coding/documentation** — These may not matter to you now (or ever), although they should since they matter to people at your new hospital. Despite their significance, billing, coding, and documentation are frequently not taught well during residency (possibly because many faculty aren't comfortable with this knowledge or aren't coding and billing themselves).[15] I encourage everyone to become familiar with and learn the electronic medical record (EMR) system at your new hospital prior to providing direct patient care. Within the EMR, it is critical to accurately record and correctly document those things you are doing and the care you are providing,

References available online.

Senior residents in EM, congratulations on making it to your final year of training! This is certain to be an exciting time. It will also be challenging and stressful. Never forget that the work you do is important to the lives, health, and wellness of so many people, their families, and friends. There is a great deal to learn and to crystallize during your final year of training, whether you are in your third or fourth year of residency, or in fellowship. To assist with your transition, I share several observations and describe five actions that can increase the likelihood of your success and happiness.

including necessary interpretations. This generates revenue for your group, for your hospital, and possibly for you (directly or indirectly). Furthermore, appropriate documentation, coding, and billing should improve your job security. If your group depends on revenue generated from patient care that is reimbursed as the result of documentation, coding, and billing, why wouldn't they also pay attention to individual metrics related to reimbursement? This is especially true if an ED is losing money, or if you are an outlier compared to your colleagues with respect to billing (and generating revenue). Despite these pressures, do not bill for things you haven't done, which is illegal. Nor should you perform procedures or order tests that are unnecessary for extra revenue, which is unethical. Granted, documentation, coding, and billing are difficult topics. Gain as much exposure as possible during your training and prior to your new position. I also strongly recommend meeting with the billing company at your new position early on (preferably before you start) and more than once, soliciting feedback about how you are doing and how you can improve.[16]

4. **Wellness, especially resilience** — How are you taking care of your own health and needs? How well are you sleeping? How often are you pursuing hobbies and relationships outside of work?[17] Are you exercising regularly and eating well? Are you smoking, drinking, or relying on medications to help you deal with stress, anxiety, or sleep?[18] Are you comfortable seeking professional help for struggles you might be facing? Resilience is also a significant part of wellness. How well do you bounce back from a tough case, a bad outcome, an error, a lawsuit, a stretch of shifts, an overnight shift, a personal or family problem, any conflict, or financial stress?[19] Wellness is central to your resilience, and resilience is central to your wellness. Both are essential to your general health and for your overall performance. It's wise to pay close attention to them at all times, not only when things become challenging. Consider developing a consistent mindfulness practice you can rely on during work and during personal time. Many studies by numerous authors have demonstrated the benefit of keeping a gratitude journal, although I urge you to avoid using social media as your "journal."

5. **Mentorship** — Mentors and mentorship have proven to be critical to the development and advancement of professionals at all levels. Seek mentorship. It isn't necessary to have mentors with similar backgrounds, or shared gender or ethnic characteristics. It is quite reasonable to have more than one mentor, even someone from outside of EM. However, it is best to find mentors who share similar values and desire to help you achieve your goals (not their own). Make and take time to reach out to mentors for advice, wisdom, and help supporting your growth. A mentoring relationship increases the likelihood of success and improves performance outcomes. Greater job satisfaction, faster promotions, higher salaries, and increased productivity are only a few outcomes of having (and working with) a strong mentor or mentors. Discuss with your mentor the best ways to maintain joy and meaning in your work. Gain their advice about work-life harmony (a term I prefer over the phrase "work-life balance").[20-22]

I wish you the very best during the remainder of your training and throughout your career. It is always beneficial to develop new skills, to invest time learning more about topics you might not know as well as you could, to improve efficiency and communication, and to actively pursue mentorship. There is no weakness in focusing on your own health and wellness, seeking advice, understanding your limitations, and being dedicated to continuous learning and improvement.

I have great respect for what you are doing and all that you've accomplished so far in your careers. I hope you are proud of your triumphs and achievements as well. ✶

References available online.

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

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EMRA ECG Challenge

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Jeremy Berberian, MD
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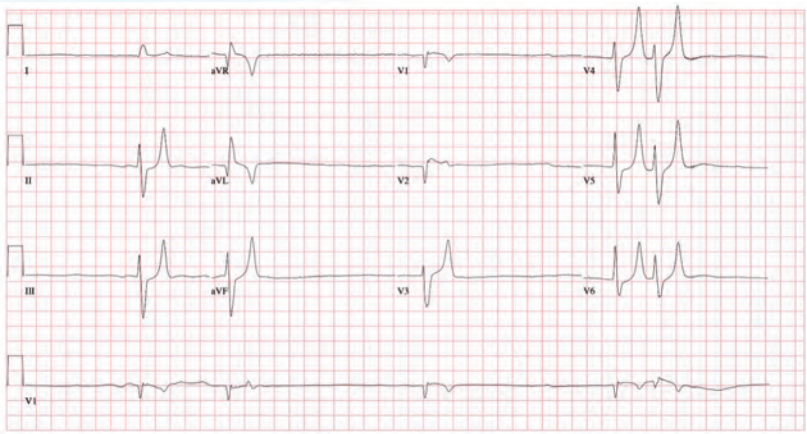
ChristianaCare

CASE

A 74-year-old male with a PMH of HTN, CKD, and HFpEF presents with exertional weakness and near-syncope for the past 2 days.

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



References available online.

ECG Challenge

ANSWER

This ECG shows and irregularly irregular bradycardia with a ventricular rate of 30 bpm, near-absent P-waves, left axis deviation, prolonged QRS complex duration, STE in leads in V1-V2, and peaked T-waves in leads II, III, aVF, and V3-V6.

Possible etiologies of an irregular bradycardia include atrial fibrillation with slow ventricular response, atrial flutter/tachycardia with slow ventricular response, wandering atrial pacemaker, 2nd degree AV block Mobitz types I and II, variable high-grade AV block, and sinus bradycardia or junctional rhythm/bradycardia with regular/irregular pattern of PAC, PJC, and/or PVC. The rhythm in this ECG does not meet the criteria for any of these rhythms, and the findings of severe bradycardia, bizarre rhythm, peaked T-waves, and prolonged QRS complex duration are concerning for hyperkalemia.

Hyperkalemia typically causes ECG changes when the serum potassium level reaches approximately 6 mEq/L, however there is poor correlation between ECG features and the degree of hyperkalemia.[1] Although the most severe cardiac manifestations of hyperkalemia have been shown to regularly occur with potassium concentrations greater than 9 mEq/L, ECG abnormalities do not always correlate reliably with serum potassium levels and clinical decompensation can occur without profound changes in potassium concentration. In other words, the ECG has poor sensitivity and specificity for hyperkalemia and cardiac death due to hyperkalemia. Hyperkalemia can also mimic STEMI (typically anterior), Brugada syndrome, and DeWinter's T-waves.[1,4,5]

The pathophysiology behind the ECG changes seen with hyperkalemia relates to the importance of extracellular potassium in regulating the cardiac membrane potential. Initially, the increased extracellular potassium leads to increases in myocardial excitability and conduction velocity, resulting in peaked T-waves and increased risk of tachydysrhythmias.[1,2,5] As potassium levels rise further, the opposite happens- the conduction velocity decreases and the refractory period increases. The decreasing conduction velocity manifests on a 12-lead ECG as if the entire P-QRS-T complex were being pulled at both ends like a string, eventually leading to the classic sine wave pattern. The increase in refractory period can precipitate development of bradydysrhythmias such as sinus bradycardia, high grade AV blocks, and atrial fibrillation with slow ventricular response. These pro-arrhythmogenic effects can lead to ventricular tachycardia/fibrillation, PEA, or asystole.[2,3,4,5]

The initial treatment for hyperkalemia includes calcium gluconate or calcium chloride. It is important to understand how calcium stabilizes the membrane in order to monitor its effect on the EKG to guide treatment. Calcium hyperpolarizes the cardiac membrane which is why hypercalcemia can lead to a short

The initial treatment for hyperkalemia includes calcium gluconate or calcium chloride.

QT interval with STE that mimics an AMI. When hyperkalemia is severe enough to hypopolarize the cardiac membrane (ie, everything on the ECG is prolonged), calcium counteracts this affect and brings the resting membrane potential back to normal, thus mitigating the risk of bradydysrhythmias and subsequent decompensation. The effect of calcium should be evident on the ECG if appropriately dosed. It's important to note that this may not be the case if the ECG only shows peaked T-waves since this is a hyperpolarized state. That said, it is still reasonable to give calcium if there are only peaked T-waves in anticipation of worsening hyperkalemia and the associated hypopolarized state.

CASE CONCLUSION

The patient's initial labs were notable for a potassium of 8.4 mEq/L thought to be secondary to acute kidney injury in the setting of recement initiation of ACE-I therapy. He was taken for emergent dialysis for definitive treatment.

HYPERKALEMIA LEARNING POINTS

- ECG is specific but not sensitive for hyperkalemia
- ECG changes are not always sequential/progressive and include:
  - Tall, narrow, peaked T-waves (best seen in precordial leads)
  - P-wave flattening and PR interval prolongation
  - Prolonged QRS complex duration, ranging from minimal to maximal
  - Conduction abnormalities (AV blocks, fascicular and bundle branch blocks)
  - Bradycardia
  - Sino-ventricular rhythm (loss of P-waves, extremely widened QRS) with normal or slow rate
  - Ventricular dysrhythmias
- Can cause STE (common in leads V1-V2 and aVR) that mimics STEMI or Brugada pattern
- Can occur simultaneously with hyperacute T-waves and obscure early changes seen in an anterior or anteroseptal AMI
- The "syphilis of ECG abnormalities," meaning that a broad range of abnormalities can be encountered with hyperkalemia[6]

References available online.

Board Review Questions

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1. When a Sengstaken-Blakemore tube is used in the management of variceal bleeding, which measure is taken to avoid esophageal perforation?

A. Decreasing esophageal balloon pressure by 5 mm Hg every 3 hours
B. Inflating the esophageal balloon before the gastric balloon
C. Inflating the esophageal balloon to a pressure of 100 mm Hg
D. Nasogastric suctioning of stomach contents before tube placement

2. A 7-year-old boy presents for evaluation of a rash that developed after he was sick with a fever and sore throat. His mother first noticed the rash on his face and became worried when it spread to his neck. The physical examination reveals a red rash that feels like sandpaper on the child's face, neck, and upper trunk. Which pharmacotherapy should be administered?

A. Diphenhydramine
B. Doxycycline
C. Penicillin
D. Sulfamethoxazole-trimethoprim

3. A 23-year-old woman presents with wrist, knee, and ankle pain of 4 days' duration. The pain started in her left wrist and ankle, but the pain in her right knee has progressively worsened over the past 24 hours. Small, diffuse papules are noted, including on her palms. She denies trauma. On examination, the right knee is diffusely hot, red, and swollen; no deformities are noted, and other joints appear normal. Arthrocentesis is performed, and the synovial fluid is sent for culture, Gram stain, crystals, and cell count. What additional testing is needed to confirm the diagnosis?

A. Cultures of joint fluid from surgical irrigation
B. Cultures of the pharynx and vagina
C. Lyme titers
D. Serum uric acid level

4. Which patient characteristic is considered to be the greatest risk factor for suicide completion?

A. Age >75 years
B. Female sex
C. Married
D. Urban living

5. A 24-year-old man presents with a red and painful eye. An examination reveals what appears to be a foreign body in the cornea. What is the best next step in management?

A. Attempt to remove the object with a moistened cotton applicator
B. Discharge the patient home with instructions to use erythromycin ointment
C. Patch the eye closed, and arrange ophthalmology follow-up in 48 hours
D. Use a burr drill to remove the rust ring

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ANSWERS
1) A. 2) C. 3) B. 4) A. 5) A.

References available online.

NEWS & NOTES IN EMERGENCY MEDICINE

EMRA@ACEP23

EMRA had a productive and successful week of programming at ACEP SA in Philadelphia in October 2023. EMRA events included a full day of workshops for medical students (run by residents and faculty); the well-attended Residency Fair; the always in-demand Job & Fellowship Fair; meetings and programming organized by EMRA committees; Rep Council (during which five new EMRA board members were elected); a number of competitive events including SimWars and MedWAR; Airway Stories; and, of course, the ever-popular EMRA Party.

Event winners included:

CASE-CON

Residents
1st Place: Katie Lebold, MD, PhD, Stanford University Emergency Medicine
2nd Place: Trent Williams, DO, Garnet Health Medical Center
3rd Place: Eileen Francis, MD, MS, Abrazo Health

Medical Students
1st Place: Amanda Dahl, Georgetown University School of Medicine
2nd Place: Aliza Siddiqui, Chicago Medical School at Rosalind Franklin University
3rd Place: Haleigh Ferro, Johns Hopkins University School of Medicine

SIMWARS

HCA Aventura Hospital (Amit Boukai, MD, Elise Clark, MD, Townsend Reeves, MD, and Christian Ryckeley, MD)

20 IN 6

Best Lecturer: Ochan Kwon, MD, St. Barnabas Hospital Health System Bronx, for "Hit the Target: Diagnosing Pediatric Appendicitis in the Emergency Department"

Runner-Up: Travis Odom, DO, Baylor University Medical Center, for "Misoprostol — Providing Safe, Legal Healthcare During Miscarriage"

People's Choice: Anis Adnani, MD, University of Illinois - Chicago, for "Profit over Patients — Corporate Influence in Emergency Medicine"

MEDWAR

Top 3 teams: Straight Outta Yosemite from UCSF Fresno, Codebusters from Allegheny General Hospital, and Feral Guinea Pigs from Augusta University

Paul Auerbach Spirit Award: Codebusters from Allegheny General Hospital

Start making plans now to join EMRA this fall, Sept. 28-Oct. 3, in Las Vegas at ACEP24 for all our awesome EMRA events and EMRA's 50th Anniversary celebration!

ANNALS RESIDENT FELLOW ANNOUNCED

KATIE LEBOLD
MD, PHD

Annals of Emergency Medicine has selected Katie Lebold, MD, PhD, of Stanford University to serve on its editorial board as the resident fellow for the coming year. Dr. Lebold received her graduate degrees from the Oregon Health & Science University in Portland.

Each year, Annals selects a new resident fellow to serve on the editorial board. Anita Knopov, MD, of Brown University, is the immediate past resident fellow for the journal. Dr. Knopov began her term in October 2022, and her service concluded in October 2023.

ABEM MEDICAL TOX CERTIFICATION UPDATES

The American Board of Emergency Medicine (ABEM) has announced important updates to the medical toxicology continuing certification process.

Beginning in February, medical toxicology continuing certification will move to a module-based process similar to emergency medicine's MyEMCert. MyToxCert modules will emphasize relevant content, save you time, and better accommodate your schedule by administering modules that you can take anytime from anywhere. Modules will be available in February, but you will not be able to see the new requirements in your portal until late this year.

For more information, visit abem.org.

ABEM RECEIVES DEI AWARD

The American Board of Emergency Medicine (ABEM) has been selected as a recipient of the 2024 Accreditation Council for Graduate Medical Education (ACGME) Barbara Ross-Lee, DO, Diversity, Equity, and Inclusion Award, which recognizes efforts to achieve diversity, equity, and inclusion in the graduate medical education community.

"It is a tremendous honor to be recognized for our efforts to build a pathway for developing future physicians from backgrounds that are underrepresented in medicine," said ABEM President Ramon W. Johnson, MD, MBA. "This furthers our goal of setting the highest standard in emergency medicine by increasing the diversity of our physician workforce to better care for the diverse communities in which we work."

The ACGME recognizes ABEM's Dr. Leon L. Haley, Jr., Bridge to the Future of Emergency Medicine Academy for its innovation and excellence in mentoring pre-resident learners into the fields of medicine and biomedical research. The

References available online.

Haley Academy provides under-represented in medicine (URiM) rising second-year medical students the opportunity to learn about the specialty of emergency medicine and participate in a two-week mentorship program at ABEM's headquarters. Selected students join didactic lectures on topics such as health care disparities, physician diversity, and residency program applications. Students connect with thought leaders and complete a short portfolio project at the end of the experience. In addition, students travel to two nearby emergency medicine residency programs for hands-on simulation and education.

APPLICATIONS OPEN FOR HALEY ACADEMY

Applications are now open for the June 2024 Dr. Leon L. Haley, Jr., Bridge to the Future of Emergency Medicine Academy, an award-winning program that provides under-represented in medicine (URiM) medical students the opportunity to participate in an in-person, two-week mentorship session at ABEM's headquarters in East Lansing, Mich.

Interested students should submit their applications along with a personal statement, current resume or CV, and dean's letter of support. A brief virtual interview is required prior to the selection of the finalists. Deadline to submit applications is Feb. 20. More information is available on ABEM's website.

EMRA IPP INTRODUCES AMA RESOLUTION

JESSICA ADKINS MURPHY, MD

EMRA Immediate Past President Jessica Adkins Murphy, MD, introduced a resolution to the American Medical Association (AMA) voicing the importance of bereavement leave for medical students and physicians. The resolution, now adopted as official policy of the AMA, urges medical schools, hospitals, and medical practices to implement certain guidelines protecting leave for events impacting family planning, pregnancy, or fertility (including pregnancy loss, an unsuccessful round of intrauterine insemination or of an assisted reproductive technology procedure, a failed adoption arrangement, or a failed surrogacy arrangement). The resolution has garnered widespread support among residents and medical students. ✶

References available online.

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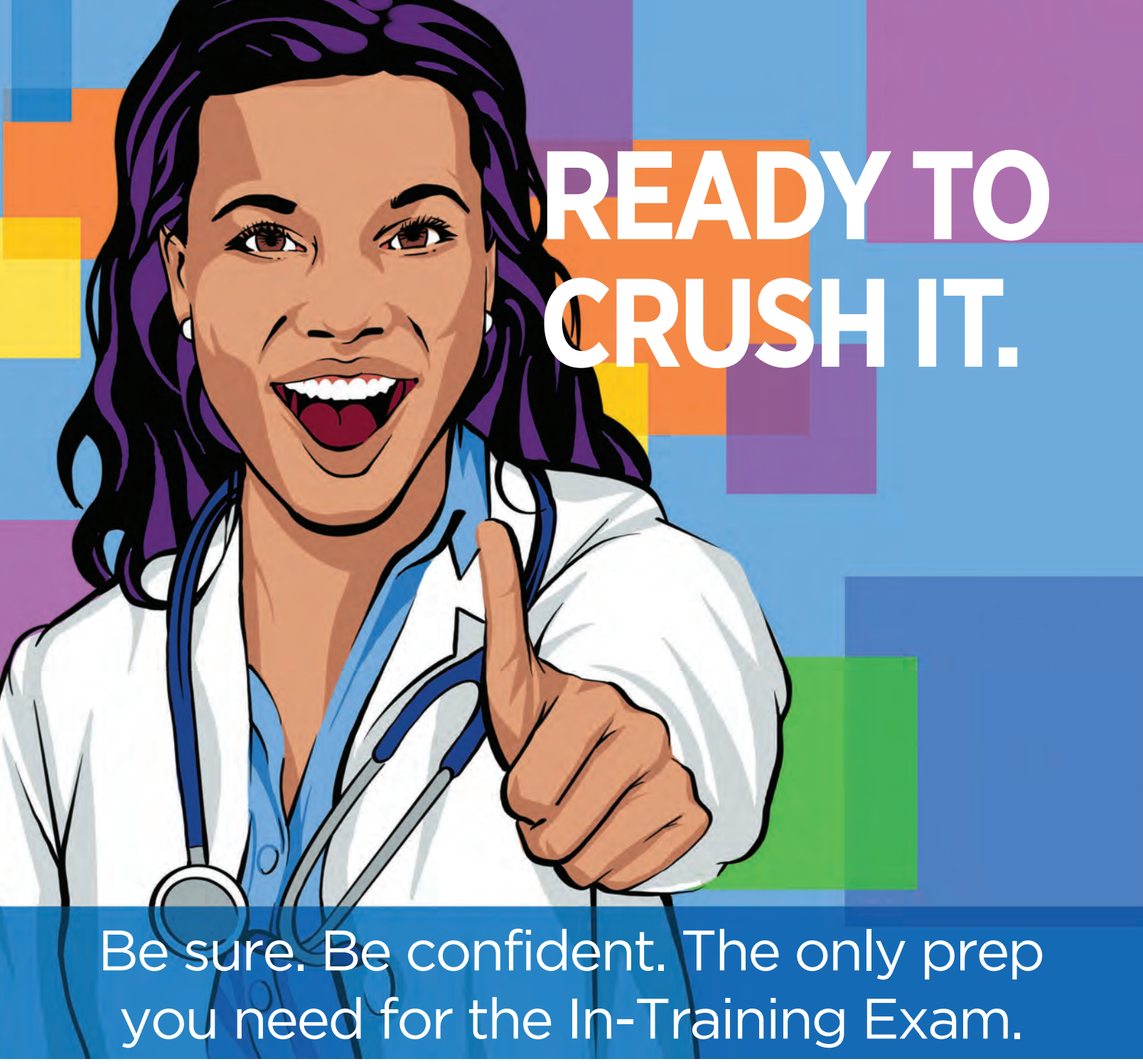

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#CORDAA24

March 25th - 28th, 2024

35th Anniversary

CORD

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