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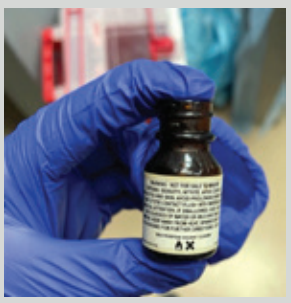

CASE REPORT

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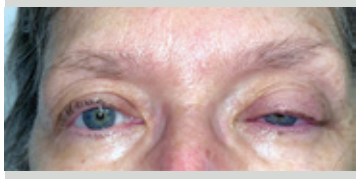

CASE REPORT

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JIM WATSON/AFP VIA GETTY IMAGES

Dr. Lorna Breen's sister, Jennifer Feist (right), and her husband, Corey, cofounders of the Dr. Lorna Breen Heroes Foundation, walk with family members to President Biden's signing of the Dr. Lorna Breen Health Care Provider Protection Act on March 18, 2022.

From Legislation to Law

AFTER TWO YEARS OF TIRELESS ADVOCACY, THE DR. LORNA BREEN BILL IS SIGNED INTO LAW

by JORDAN GRANTHAM & RYAN MCBRIDE

When President Biden signed the Dr. Lorna Breen Health Care Provider Protection Act on March 18, it was a bittersweet moment for all involved. It marked the culmination of two years of persistent advocacy to prioritize physician mental health, but the triumph of passing the bill is impossible to separate from the tragedy of losing Dr. Breen—a sister, a daughter, a friend, and an emergency physician colleague. Still, this law that carries her name is an important step to protect emergency physicians

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Importance of System-Level Wellness

by HEIDI J. LEVINE, DO, & NIDHI GARG, MD

One of the most important lessons learned during the COVID-19 pandemic is the critical nature of strong, well-established organizational systems that provide academic, emotional, spiritual, environmental, social and financial well-being supports. Research into the topic of organizational systems reveals that multiple factors are involved in making these systems successful and effective.[1,2] When looking at networks as systems, strong and effective leadership is critical, networks must be fluent, and how communication is dispensed is of the utmost importance.[1] Top-level organizational support and leadership involvement are indispensable to the perception of organizational support.[2] Multiple research articles document the need for broad change in the area of emotional wellness for physicians, especially those on the front lines.[3,4]

The Medscape Physician Burnout & Depression Report for 2022 showed that 60 percent of emergency physicians surveyed were burnt out.[5,6] More females were affected, and almost half of the physicians surveyed admitted to using isolation as a

CONTINUED *on page 7*

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NEWS FROM THE COLLEGE

UPDATES AND ALERTS FROM ACEP

ACEP Board of Directors Election Slate Finalized

ACEP's Nominating Committee has selected the slate of candidates for 2022. Elections will occur during the Council meeting on Friday, Sep. 30, in advance of ACEP22 in San Francisco.

During this election cycle, there are four Board of Directors positions to be filled. ACEP Council elected two officers at the 2021 Council Meeting and has no open positions this year.

President-Elect

- Aisha T. Terry, MD, MPH, FACEP (DC)–unopposed

Board of Directors Candidates

- William B. Felegi, DO, FACEP (NJ)
- Jeffrey M. Goodloe, MD, FACEP (incumbent–OK)
- Gabor D. Kelen, MD, FACEP (incumbent–MD)
- Jeffrey F. Linzer, Sr., MD, FACEP (GA)
- Kristen McCabe-Kline, MD, FACEP (FL)
- Henry Z. Pitzele, MD, FACEP (IL)
- Ryan Stanton, MD, FACEP (incumbent–KY)

Visit acep.org/board-nominations to learn more about the selection process and floor candidates.

Participate in EM Wellness Week

May is Mental Health Awareness Month, and ACEP's Wellness Section is marking the occasion by hosting its annual Emergency Medicine Wellness Week from May 22–28. The section has developed a different point of focus for each day during Wellness Week:

- **May 22:** Boost those endorphins and connect with your peers by joining the #BikERdoc Peloton group ride.
- **May 23:** Schedule a morning or afternoon, now or later, to do something you truly enjoy.
- **May 24:** Try a self-guided meditation to manage moral injury.
- **May 25:** Seek cardio and connections during the #BikERdoc Peloton run.
- **May 26:** Check your physical and financial vitals.
- **May 27:** Make time for an act of forgiveness and/or gratitude.
- **May 28:** Self-reflect. Why are you in EM? Share your why.

Learn more about ACEP's physician wellness support at acep.org/wellness-hub.

New 988 Suicide Prevention Lifeline Goes Live in July

Starting July 16, 9-8-8 will be the new direct, three-digit line to trained National Suicide Prevention Lifeline counselors, opening the door for millions of Americans to seek the help they need. Those who call or text 9-8-8 will be connected to trained counselors through the National Suicide Prevention Lifeline's network. To better understand how this change affects emergency medicine, watch the on-demand webinar in ACEP's Online Learning Collaborative (acep.org/olc) featuring Emmy Betz, MD, MPH, a leading suicide prevention researcher, John Draper, PhD, executive director of the National Suicide Prevention Lifeline, and Tony Ng, MD, chair of the Coalition of Psychiatric Emergencies.

Award Honors Innovations in Suicide Prevention

Every year, ACEP partners with the American Foundation for Suicide Prevention to bestow the Innovation in Suicide Prevention Award. This honor recognizes promising and innovative acute care activities in the area of suicide prevention, that improve patient outcomes and lives of patients and/or clinicians. Nominations are being accepted through June 30.

Last year's winner was Emergency Psychiatric Intervention (EPI), a unique conceptual framework to improve the emergency department care of patients with mental health emergencies. Utilizing the same principles that improved ED care for patients with critical medical illnesses—early risk stratification, eliminating over-processing, immediate treatment, and proactive staff education—EPI decreases the risk of suicide in patients with mental health crises who seek care in the ED. Learn more about past winners and nominate a deserving suicide prevention initiative at www.acep.org/innovation-in-acute-care-suicide-prevention.

Member Benefit Offers Counseling, Legal Support

Your job has always been challenging, and the past two years of pandemic concerns have not alleviated your stress. The ACEP Wellness & Assistance Program offers ACEP members exclusive access to three FREE counseling or wellness sessions in partnership with Mines & Associates. For $15 a year, ACEP members can receive additional legal and financial support, including services related to:

- Business legal services
- Financial matters
- IRS matters
- Real estate & estate planning law
- Immigration and naturalization
- Personal/family legal services
- Civil/consumer issues

This program is strictly confidential and FREE with your ACEP membership. Learn more at acep.org/support.

SEND YOUR THOUGHTS AND COMMENTS TO ACEPNOW@ACEP.ORG

THE BREAK ROOM

"We Dissent!"

Letter to the Editor

The thoughtful article by Dr. Gaddis about significant occurrences of reasoned dissent in the history of emergency medicine omitted one important mention. In 1971, Gail V. Anderson, Sr., MD, became America's (and perhaps the world's) first professor and chair of an academic department of emergency medicine at the University of Southern California. At the time, he was a widely respected obstetrician, gynecologist, and an examiner for the American Board of Obstetrics and Gynecology. When he informed colleagues of his decision to accept the dean's offer, he was told by many that he was committing "professional suicide." He dissented, saying that the birth of emergency medicine as an academic specialty needed to happen and proceeded to organize the new department by recruiting faculty members and three initial residents.

The description of the overturning of the "Fifth Vital Sign" by Dr. Gaddis was quite apt. I was ACEP's representative on an advisory committee to The Joint Commission when the move to make "Pain as the Fifth Vital Sign" was introduced. Despite a number of committee members expressing objections (I recall facetiously suggesting that nausea and vomiting be the sixth vital sign), the flawed concept was instituted. It was gratifying to see that the dissenting efforts of ACEP and others finally bore fruit a few years ago.

—Gail V. Anderson, Jr., MD, MBA, FACEP

CORRECTION

A previous version of Dr. Jamie Kuo's article, "If Not Me, Then Who?" ran an abridged version of the opening paragraph leading to some confusion. The correct version is, "It was a bill that would grant full practice authority to advanced practice registered nurses, who would no longer need to collaborate with a supervising physician when treating patients."

Honoring Your Excellence: 2022 Leadership and Council Award Winners

The ACEP Awards Program strives to celebrate leaders in emergency medicine across all career stages and practice environments. The program recognizes members for significant professional contributions, as well as service to the College. These awards will be presented at various venues during ACEP22 in San Francisco. Congratulations to all of the honorees!

2022 ACEP Leadership Awards

- John G. Wiegenstein Leadership Award: **Rebecca B. Parker, MD, FACEP**
- James D. Mills Outstanding Contribution to Emergency Medicine Award: **Richard C. Hunt, MD, FACEP**
- Judith E. Tintinalli Award for Outstanding Contribution in Education: **Peter M. DeBlieux, MD, FACEP**
- Outstanding Contribution in Research Award: **Deborah B. Diercks, MD, MSc, FACEP** and **Kevin Ward, MD, FACEP**
- Outstanding Contribution in EMS Award: **Ronald M. Roth, MD, FACEP**
- Colin C. Rorrie, Jr. Award for Excellence in Health Policy: **Jennifer L. Wiler, MD, MBA, FACEP**
- Policy Pioneer Award: **Zachary J. Jarou, MD, MBA**
- John A. Rupke Legacy Award: **Louis J. Ling, MD, FACEP**
- Honorary Membership Award: **Brad Gruehn; Margaret Montgomery, RN, MSN; John "Jack" Rozel, MD, MSL, DFAPA;** and **William Todd Thomas, CPC, CCS-P**
- Pamela P. Bensen Trailblazer Award: **Michael L. Callaham, MD, FACEP**
- Diane K. Bollman Chapter Advocate Award: **Sue Barnhart and Colleen Kochanek**
- Disaster Medical Sciences Award: **Roy L. Alson, MD, PhD, FACEP**

2022 Council Awards

- Council Meritorious Service Award: **James B. Aiken, MD, FACEP**
- Teamwork Award: **Louisiana Chapter**
- Horizon Award: **Scott Pasichow, MD, MPH,** and **Michael Ruzek, DO, FACEP**
- Champion of Diversity & Inclusion: **Ramon W. Johnson, MD, FACEP**
- Curmudgeon Award: **Marsha D. Ford, MD, FACEP**

whose emotional health and wellbeing suffered even before this prolonged pandemic, and it helps preserve the memory and legacy of Dr. Breen and other health care physicians who have suffered in silence.

From start to finish, ACEP was deeply involved in the process—helping develop the legislative language, pushing it through the legislative process, hosting hundreds of meetings with legislators during ACEP's 2021 Leadership & Advocacy Conference (LAC21), persistent grassroots outreach by ACEP members, and collaborative efforts with other health care groups and the Dr. Lorna Breen Heroes' Foundation—this legislative victory is a testament to our collective voice. Throughout this bill's journey, your voices were heard.

Now that the bill crossed the finish line, let's retrace its path to victory.

MARCH 2020

ACEP began working with Rep. Raja Krishnamoorthi (D-IL) on efforts to address stress, anxiety, and burnout among health care workers exacerbated by the COVID-19 pandemic. This initial effort centered around establishing a grant program within the U.S. Department of Health and Human Services (HHS) to increase access to confidential mental health assessment and treatment options for health care workers, as well as funding a comprehensive study on health care worker mental health, including a particular focus on the impacts of the COVID-19 pandemic.

APRIL 2020

When Dr. Breen died by suicide on April 26, 2020, ACEP accelerated the effort to draft legislation aiming to reduce and prevent suicide, burnout, and mental and behavioral health conditions among health care professionals.

MAY 6, 2020

Rep. Krishnamoorthi led a bipartisan letter signed by 90 members of the House of Representatives asking Congress to establish the HHS grant program for health care workers and conduct the study on health care workers mental health and burnout. ACEP and more than 50 other physician and health care associations supported the letter, with ACEP President William Jaquis, MD, FACEP, quoted in the Congressman's press release on the letter.

JUNE 18, 2020

Reps. Krishnamoorthi, John Katko (R-NY), and Frederica Wilson (D-FL) introduced the *ACEP-supported bipartisan Coronavirus Health Care Worker Wellness Act* (H.R. 7255) to carry out those aforementioned priorities. Dr. Jaquis was again quoted in the press release.

JUNE 20, 2020

ACEP and other leading medical associations, academics, and psychiatry experts issued a joint statement outlining necessary steps to support the mental health of emergency physicians and other health care professionals on the front lines of the pandemic.

During this time, ACEP also began working with Senator Tim Kaine (D-VA) on the issue. Senator Kaine had taken a particular interest as not only had Dr. Breen's story resonated on a national level, but her family members were his constituents and she was in Virginia when she died. ACEP worked with the Senator and his staff to help fill out their vision for legislation to provide short-, medium-, and long-term solutions to help address the myriad challenges and hurdles specific to mental health for physicians.

JULY 29, 2020

The *Dr. Lorna Breen Health Care Provider Protection Act* (S. 4349) was introduced in the Senate of the 116th Congress by Sens. Tim Kaine (D-VA), Todd Young (R-IN), Jack Reed (D-RI), and Bill Cassidy (R-LA). ACEP staff helped secure specific legislative language to ensure health professional organizations (like ACEP) were eligible for grants to promote mental health among the health care professional workforce.

AUGUST 22, 2020

The *Dr. Lorna Breen Health Care Provider Protection Act* (H.R. 8094) was introduced in the House by Reps. Max Rose (D-NY), David McKinley (R-WV), Anthony Brindisi (D-NY), Denver Riggleman (R-VA), Gil Cisneros (D-CA), Morgan Griffith (R-VA), and Fred Upton (R-MI).

Ultimately, the legislation was not considered by the relevant committees, nor was it included in any of the COVID-19 relief packages or any other legislation that passed during the remainder of the 116th Congress.

MARCH 4, 2021

The *Dr. Lorna Breen Health Care Provider Protection Act* (S. 610) was reintroduced in the Senate of the 117th Congress by Sens. Tim Kaine (D-VA), Todd Young (R-IN), Jack Reed (D-RI), Bill Cassidy (R-LA), and others.

MARCH 8, 2021

The *Dr. Lorna Breen Health Care Provider Protection Act* (H.R. 1667) was reintroduced in the House by Reps. Susan Wild (D-PA), David McKinley (R-WV), Raja Krishnamoorthi (D-IL), Fred Upton (R-MI), Judy Chu (D-CA), Morgan Griffith (R-VA), Haley Stevens (D-MI), John Katko (R-NY), and others.

MARCH 11, 2021

In a very unique development, the *American Rescue Plan Act of 2021* (P.L. 117-2), a $1.9 trillion COVID-19 relief package passed by Congress through the "budget reconciliation" process, appropriated $140 million for clinician mental health grants and education campaign funding under the Breen bill framework.

Why was this unusual? Congress typically passes authorizing legislation and *then* appropriates funding afterward. In this case, funding came first, but ACEP continued working to get the authorizing legislation passed that would provide additional guidance and clarity on how the funds should be distributed. Plus, the bill included a study regarding health care professional mental health, burnout, and barriers in seeking appropriate care—provisions that were not eligible to be included under the budget reconciliation rules.

MAY 25, 2021

The Senate Health, Education, Labor, and Pension (HELP) Committee passed a committee markup by a unanimous voice vote. Sen. Kaine specifically thanked ACEP for our efforts during the committee hearing.

JULY 16, 2021

The Health Resources & Services Administration (HRSA) opened the grant application process for health care worker mental health programs via the funding provided by the *American Rescue Plan Act*.

JULY 25-28, 2021

ACEP hosted LAC21, bringing members together in-person for the first time since the beginning of the pandemic. Generating support for both the House and Senate versions of the Breen bill (H.R. 1667 and S. 610) was a primary focus of our meetings with legislators. ACEP members conducted 287 meetings with legislators and staff from 44 states, giving firsthand perspectives on physician mental health concerns. These testimonials are so important; they remind legislators and staffers that this issue is not just political—it's a real problem that affects real people. And just days later ...

AUGUST 6, 2021

The full Senate approves S. 610 under unanimous consent! This was a huge step, generating a lot of momentum for the legislation.

ACEP then turned its focus to pushing for the House to take up S. 610. This is where it got tricky—(in most cases) the exact same bill needs to be approved by both the House and the Senate. Because the Senate bill underwent some carefully-negotiated, but relatively minor changes before its unanimous approval, ACEP encouraged the House to consider the Senate version to ease its pathway toward enactment. However, the House Committee on Energy and Commerce had their own considerations they wanted to address and chose to consider the House version of the bill, H.R. 1667, instead. Unfortunately, this meant that even if passed by the House with minor changes, H.R. 1667 would still need to go back to the Senate for approval.

NOVEMBER 4, 2021

The House Committee on Energy and Commerce held a legislative markup of nine health care bills, including the House version of the Lorna Breen Act (H.R. 1667). The Committee made some slight changes to the legislation to help align it with the Senate bill and incorporated some minor technical changes.

DECEMBER 7, 2021

As the end of the year approached, Congress was faced with a number of significant, time-sensitive priorities all colliding at the same time, including the need to avert a nearly 10 percent cut to Medicare payments. Needing a legislative vehicle to help clear some wonky procedural hurdles, the House used the Senate-passed S. 610 bill, amending it by stripping out the entirety of the text of the Lorna Breen Act and replacing it with the Medicare fix (and some other provisions). They renamed the legislation the *Protecting Medicare and American Farmers from Sequester Cuts Act*, approved it, and sent it back over to the Senate for approval. Thankfully, the House bill was still in play.

DECEMBER 9, 2021

The full House of Representatives passed H.R. 1667 in a bipartisan 392-36 vote. As a result of the changes made by the House to H.R. 1667, the Senate was then required to vote on the House-passed bill one final time.

FEBRUARY 17, 2021

The Senate approved H.R. 1667 by unanimous consent, clearing the measure to be sent to the President for his signature.

MARCH 18, 2021

President Biden signed H.R. 1667 into law.

WHAT NOW?

ACEP continues to work on the issue of mental health for patients and for health care workers alike on both the legislative and regulatory fronts. We are working with Senator Kaine on what he envisions as "Breen 2.0" to address some of the other lingering challenges affecting health care workers and how they seek and access mental health care treatment, and we continue working with various congressional committees that have recently turned their focus to the nation's mental health crisis as well.

Join ACEP's 911 Grassroots Network (acep.org/911grassrootsnetwork) to receive weekly progress updates from our legislative and regulatory teams.

How Can They Refuse?

Approach to psychiatric patients who wish to refuse treatment in the emergency department

by EILEEN F. BAKER, MD, PHD, FACEP; JAY BRENNER, MD, FACEP; SAMANTHA CHAO, MD; ARTHUR DERSE, MD, JD, FACEP; CATHERINE MARCO, MD, FACEP; AND LAURA VEARRIER, MD, DBE, FACEP, HEC-C

Case Presentation

A 28-year-old man is brought to the emergency department (ED) by his partner. He regularly drinks alcohol and has a history of depression but stopped taking his medications a month ago. He told his partner he was going to hang himself with a rope or belt and has threatened suicide in the past. Upon arrival, the patient appears inebriated and emotional. As you examine him, he becomes agitated and attempts to strike the nurse and leave the emergency department.

You notify hospital security to help subdue the patient and treat him with intramuscular haloperidol and lorazepam. Vital signs are temperature 98.8 degrees F, blood pressure 130/84, pulse 102, respiratory rate 18 and oxygen saturation 98 percent on room air. His electrocardiogram (ECG), liver function tests and other labs are normal. Toxicology screen is positive for cannabinoids, benzodiazepines, and serum ethyl alcohol (EtOH) is 281 mg/dL. The county's hospital psychiatric consultation service agrees to see the patient after waiting for his EtOH level to diminish. In speaking with the patient, the psychiatric assessor determines that he has access to lethal means of harm, including firearms at home. She initiates a psychiatric hold, which you sign, and attempts to place the patient in a psychiatric inpatient unit; no beds are available currently, but one is expected to open soon. The patient's financial status precludes private psychiatric hospital admission. After 30 hours in your emergency department, the patient becomes restless. He wants to go out to smoke and demands to leave. His nurse asks, "Can we just sign him out against medical advice so he can go have his cigarette?"

Decisional Capacity and Informed Consent

Decisional capacity requires (1) the ability of the patient to understand the information relevant to the medical decision at hand, including reasonable alternatives and no treatment; (2) the ability to evaluate the consequences and make a decision consistent with the patient's own goals and values; and (3) the ability to communicate the decision.[1] This may be determined using the Aid to Capacity Evaluation (ACE).[2]

Seeking and obtaining informed consent for, or refusal of, treatment is a routine part of the physician-patient interaction. In 1914, Supreme Court Justice Benjamin Cardozo stated that "[e]very human being of adult years and sound mind has a right to determine what shall be done with his own body."[3] In the second half of the 20th century, court rulings asserted that patient consent to treatment must be "informed"—that is, it must be based on provision of information to patients about their diagnoses, the nature of the proposed treatments, the potential risks (common and severe) of those treatments, alternative treatments and the expected disease course in the absence of treatment.[4] Despite legal and ethical guidance, cultural, social, educational, health, and mental status factors pose ongoing challenges in understanding and honoring patient rights to informed consent.

TABLE 1: Informed Consent and Decisional Capacity

Component of Informed Consent	Component Elements	Ethical Challenges
Information	• Nature of the proposed treatment • Alternative treatments • Expected disease course with/without treatment • Physician's professional recommendation	• What level of descriptive detail is necessary/sufficient • Inherent uncertainties in medical treatment • Separating personal values from professional opinion • Being efficient and effective
Voluntariness in Decision Making	• Decision is made without force or coercion • Physician uses appropriate language and tone and corrects any misunderstanding • Conversation tailored to patient needs	• Difficulties in promoting voluntariness within an involuntary state • How to know when decisions are voluntary • Nudging to influence choice architecture
Decisional Capacity	• The patient must possess a reasonably stable framework of values and goals to guide personal decisions and have the ability to receive and understand information, the ability to make deliberative decisions, and the ability to articulate and communicate that decision	• When patient goals/values fluctuate • When faulty decision making fails to promote patient's personal goals/values • When adherence to personal values is detrimental to health • How and to what extent comprehension should be assessed • How to overcome barriers to communication

Refusal of Treatment

Intoxication

There is broad consensus that intoxicated patients lack decisional capacity and therefore do not have the ability to consent to or refuse treatment. There is, however, a lack of consensus about what constitutes intoxication or what level of decision making about one's health is affected by intoxication. Many psychiatrists request medical screening necessitating a serum EtOH less than 80 mg/dL or 100 mg/dL for admission, though many emergency physicians think that the determination of intoxication is a clinical one. Intoxicated patients, regardless of how this is defined, may not refuse life-sustaining treatment, such as a mental health evaluation, but may refuse interventions without life-threatening consequences, such as sutures placed for cosmesis.

Psychiatric Emergency

The original court ruling in the Massachusetts case *Rogers v. Okin* narrowly defined a psychiatric emergency as a situation that poses, "the substantial likelihood of physical harm."[5] The definition was eventually broadened to include both, "occurrence or serious threat of extreme violence, personal injury or attempted suicide" as well as the "necessity of preventing immediate, substantial and irreversible deterioration of a serious mental illness ... in which even the smallest of delays would be intolerable."[6] One can see that this interpretation leaves broad scope to the judgment of the emergency physician.

Determination of Danger to Self and/or Others

To assess a patient's risk of suicide and harm to self, emergency physicians can use validated screening tools, including ICAR2E and ED-SAFE, which consider factors such as a patient's preexisting psychiatric illnesses, history of prior attempts, and access to lethal means.[7]

Tools that have been developed to screen for violent and harmful behavior toward others in both the health care and criminal justice fields have variable predictive validity, so clinical judgment is required.[8,9] Emergency physicians should be wary of how implicit biases may impact their assessment of patients' risk to self or others.

Project BETA (Best Practices in the Evaluation and Treatment of Agitation) provides consensus guidelines on managing patients with acute agitation in the emergency department and recommends a first-line approach of verbal de-escalation and identifying and treating contributing underlying or psychiatric conditions.[10] Physical restraints should always be a last resort. Further, physicians should not use pharmacological tools with the goal of sedating patients long term. Finally, if a patient is believed to pose a reasonable threat to an identifiable target, observance of the Tarasoff Duty to Warn obliges physicians in most states to prioritize safety of others over patient confidentiality.[11,12] The justification for this is that the benefit of mitigating foreseeable and significant harm to a third party outweighs encroachment on the patient's confidentiality and autonomy.

Emergency Detention Statutes and Regulations

All 50 states have emergency hold laws that allow involuntary admission to a health care facility for persons with an acute mental illness that may result in danger to self or others. There is significant variation regarding the duration of the hold, who can initiate the hold, and rights of patients. Nearly all states specify rights of patients, which may include the right to phone calls, access to an attorney, right to appeal, written notification of the reason for the hold, and discharge transportation.[13]

Conclusion and Case Resolution

Tools for assessing capacity as well as suicide risk are available to the emergency physician. The patient described does not have the right to refuse treatment due to his acute intoxication and to the emergency physician's determination that he poses a threat to himself or others. Every effort should be made to use verbal de-escalation techniques and patient education to intervene on the patient's behavior. Allowing family or friends to visit may help orient and educate the patient during extended wait times for placement in a psychiatric facility. Although physical or pharmacological means of treating agitation may be employed, emergency physicians must keep in mind issues of safety for themselves and the ED staff.

In this specific case outlined earlier, the physician judges that the patient continues to pose a threat to himself and medications are used to sedate him until a psychiatric transfer is possible. He is also offered a nicotine patch.

References

1. Derse AR, Schiedermayer DL. *Practical Ethics for Students, Interns, and Residents*. 4th ed. Hagerstown, MD: University Publishing Group; 2015.
2. Aid to capacity evaluation (ACE). Joint Centre for Bioethics. http://www.jcb.utoronto.ca/tools/ace_download.shtml.
3. *Schloendorff v Society of New York Hospital*, 211 NY 125, 105 NE 92 (1914).
4. *Salgo v Leland Stanford Jr. University Board of Trustees*, 154 Cal App 2d 560, 317 P 2d 170 (1957).
5. *Rogers v Okin*, 478 F Supp 1342 (D Mass 1979).
6. *Rogers v Commissioner of Department of Mental Health*, 458 NE 2d 308 (Mass 1983).
7. Brenner JM, Marco CA, Kluesner NH, et al. Assessing psychiatric safety in suicidal emergency department patients. *J Am Coll Emerg Physicians Open*. 2020;1(1):30-37.
8. ACEP Public Health and Injury Prevention Committee. Risk assessment and tools for identifying patients at high risk for violence and self-harm in the ED. ACEP. 2015. https://www.acep.org/globalassets/sites/acep/media/public-health/risk-assessment-violence_self-harm.pdf.
9. Singh J, Grann M, Fazel S. A comparative study of violence risk assessment tools: a systematic review and metaregression analysis of 68 studies involving 25,980 participants. *Clin Psychol Review*. 2011;31(3):499-513.
10. Roppolo L, Klinger L, Leaf J. Hostile workplace: emergency management of the agitated patient. *Crit Decis Emerg Med*. 2019;33(2):3-10.
11. *Tarasoff v Regents of University of California*, 17 Cal 3d 425, 551 P 2d 334, 131 Cal Rptr 14 (Cal 1976).
12. Mental health professionals' duty to warn. National Conference of State Legislatures. 2018.
13. https://www.ncsl.org/research/health/mental-health-professionals-duty-to-warn.aspx.
14. Hedman LC, Petrila J, Fisher WH, et al. State laws on emergency holds for mental health stabilization. *Psychiatr Serv*. 2016;67(5):529-535.

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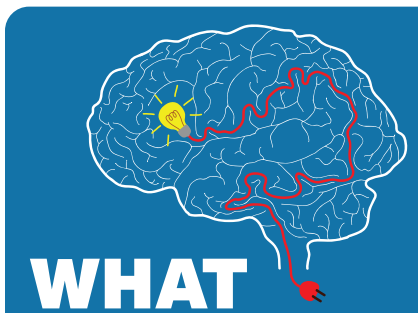
WELLNESS | CONTINUED FROM PAGE 1

coping technique.[5] Our own study of emergency physicians within the Northwell Health system showed that the COVID-19 pandemic had a greater impact on the well-being of female physicians and those with less than 11 years of practice.[7] Prior studies have also concluded that female physicians and those in practice less than 20 years are at higher risk for burnout.[8]

To maintain the well-being of our physicians, the walls of stoicism that health care has built must be torn down. Long-term organizational support is critical in dealing with the crisis in health care workers' mental health that has resulted from the COVID-19 pandemic. Resources should be shared throughout organizations, with the focus on evidence-based interventions.[9] This especially applies to building staff resilience. Organizational systems must promote open discussion and support for emotional wellness, with administrators leading by example.

Prior to the pandemic, the Northwell Health system offered multiple wellness offerings that encompassed many well-being categories. An Employee Assistance Program and Physician Resource Network that offered emotional support for employees was in place prior to the pandemic. Options like WW (formerly known as Weight Watchers) and smoking cessation support were also available. For years, a health risk assessment tool has been offered to employees as an incentive to receive financial credit on paychecks. Various support groups also have been available, long before the pandemic ever started. Northwell also had a Center for Integrative Medicine, where employees could partake in yoga, Pilates and guided meditation classes at a discount.

During the pandemic, Northwell's Wellness division expanded its services. An emotional support call center was established with 24-hour support available. On-site and telephone access to spiritual leaders was created. Tranquility tents were constructed to create a space where hospital staff could decompress and obtain information on emotional resources. The Center for Traumatic Stress, Resilience and Recovery was created. It offers therapy and resilience skill building for both the individual and groups. The Center for Integrative Medicine offered free online classes, and access to multiple exercise videos was available to all employees. Multiple free or discounted apps like the Clinician Experience Project and Headspace were also



WHAT ARE YOU THINKING?

If you have a story idea or drafted article, e-mail the word document file to Editor Danielle Galian or Medical Editor in Chief Cedric Dark, MD, MPH, FACEP. We'll review your article submission and update you on next steps.

SEND EMAIL TO ACEPNOW@ACEP.ORG; LETTERS TO *ACEP NOW*, P.O. BOX 619911, DALLAS, TX 75261-9911; AND FAXES TO 972-580-2816, ATTENTION *ACEP NOW*.

offered. Several days of childcare were paid for by the system for those with young children. A well-being support survey was sent out to all employees to determine what services were needed and what barriers, if any, existed in relation to accessing those services. The Governor's Board Physician Well-Being group made calls to almost all physician partners to check in and see if they needed any information on available supports. An easy-to-access Well-Being Resources page was created to facilitate access to multiple wellness platforms, including the Virgin Pulse app. The last wellness survey showed an 80 percent gain in awareness of benefits, and there has been an increase in the use of Northwell's Employee and Family Assistance program since 2020. Of equal importance to our wellness support was the open stream of information with the latest data regarding the treatment of COVID-19 patients.

One of the most important things to mitigate stress during the pandemic was having enough personal protective equipment. We never were placed in the situation that our colleagues in New York City experienced. We had gowns, gloves and shields to help protect us. We had access to free coffee, healthy snacks were delivered to our departments, and scrubs were accessible around the clock. In the cafeteria, a mini market was put into place with fresh produce, small take-home meals and vital supplies like toilet paper that the local stores did not always have in stock. Without strong organizational and local support systems to promote wellness, the resilience needed to survive the COVID-19 pandemic would not have been possible. Organizational wellness systems must continue to grow as emergency physicians prepare to tackle the next pandemic.

References

1. Best A, Berland A, Greenhalgh T, et al. Networks as systems. *J Health Organ Manag.* 2018;32(1):9-24.
2. Grossmeier J, Castle PH, Pitts JS, et al. Workplace well-being factors that predict employee participation, health and medical cost impact, and perceived support. *Am J Health Promot.* 2020;34(4):349-358.
3. Hendrickson R, Hoerster K, Neville T. Health care workers' suffering goes far beyond burnout. Self-care isn't the cure. *Stat.* 2021 Dec. https://www.statnews.com/2021/12/16/health-care-workers-suffering-goes-far-beyond-burnout-self-care-isnt-the-cure.
4. Shanafelt TD, Noseworthy JH. Executive leadership and physician well-being: nine organizational strategies to promote engagement and reduce burnout. *Mayo Clin Proc.* 2017;92(1):129-146.
5. Kane L. Medscape physician burnout & depression report for 2022: stress, anxiety and anger. Medscape. 2022 Jan. https://www.medscape.com/slideshow/2022-lifestyle-burnout-6014664.
6. Chesak SS, Cutshall S, Anderson A, et al. Burnout among women physicians: a call to action. *Curr Cardiol Rep.* 2020;22(7):45.
7. Levine H, Baranchuk N, Li T, et al. An emergency

medicine physician well-being survey focusing on gender differences and years of practice during the COVID-19 pandemic. *Am J Emerg Med.* 2022;55:84-88.
9. Linzer M, Stillman M, Brown R, et al. Preliminary report: US physician stress during the early days of the COVID-19 pandemic. *Mayo Clin Proc Innov Qual Outcomes.* 2021;5(1):127-136.
10. Søvold LE, Naslund JA, Kousoulis AA, et al. Prioritizing the mental health and well-being of healthcare workers: an urgent global public health priority. *Front Public Health.* 2021;9:679397.

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NORTHWELL HEALTH

Bohlsen family emergency department entrance.

By the Numbers

Mental Health, Young People, and Your Patients

15.2%
INCREASE IN ED ADMISSIONS FOR DEPRESSION[1]

OVER 40%
teens felt persistently sad or hopeless[2]

DURING PANDEMIC 1 IN 3
students experienced poor mental health[2]

SUICIDE 20%
SERIOUSLY CONSIDERED[2]

9%
ATTEMPTED

SOURCES

1. Dana L. Sacco MD, MSc, *JACEP Open*, in press.
2. Jones SE, Ethier KA, Hertz M, et al. Mental Health, Suicidality, and Connectedness Among High School Students During the COVID-19 Pandemic — Adolescent Behaviors and Experiences Survey, United States, January–June 2021. MMWR Suppl 2022;71(Suppl-3):16–21.

THE GREAT OUTDOORS

ACEP MEMBERS FIND WELLNESS IN THE WILDERNESS

Down south in Gainesville, Florida, emergency physicians Giuliano De Portu, MD, FACEP, and Henry Young II, MD, are surrounded by rivers, lakes, and swamps that are inhabited by local and migratory birds. When they aren't working in the emergency department (ED), they love to explore the outdoors, cameras in hand, capturing stunning portraits of the birds and other wildlife they encounter.

Dr. De Portu was a full-time photojournalist before going to medical school when he was 33, but he had never photographed wildlife until the pandemic started. He and Dr. Young were both residents when they discovered their shared interest in photography and started exploring nature with their cameras as a way to destress.

"Taking time off from the ED during the pandemic was a must for me," Dr. De Portu said. "... I can go on a peaceful walk, take some photographs and connect with art and nature. It also really brings happiness to be able to share my work, and it clears my mind."

Dr. De Portu is not the only one finding joy and clarity in the great outdoors. In this photo essay, emergency physicians and medical students reflect on their favorite moments in Mother Nature.

GAINESVILLE, FL

GIULIANO DE PORTU

BOUNDARY WATERS, MINN

MICHAEL PAJOR

This past summer, my brother and I went canoeing in the Boundary Waters of northern Minnesota. We were 60 miles from the nearest town, 55 miles from the nearest cell service and five miles away from any other human. The only sounds audible were the waves on the lake and the calls of an occasional loon flying by. The following quote from *The Power of Silence* by Robert Cardinal Sarah echoed true:

"Silence is not an absence. On the contrary, it is the manifestation of a presence, the most intense of all presences. ... The real questions of life are posed in silence. Our blood flows through our veins without making any noise, and we can hear our heartbeats only in silence."

Michael Pajor, MD, PGY-II
Washington University School of Medicine, St. Louis

KAZBEGI, REPUBLIC OF GEORGIA

BRIAN HILANDS

During lockdown, I began exploring film photography and the city I grew up in. I started spending more time in nature, hiking and hanging from trees. These past years have been tough on us. We live in a society that is fast-paced; society often goes on without us. We are told that time is precious and limited, so we should make the most of it and accomplish as much as we can. But in doing so, many of us lose sight of the importance of being present. So, this past year, I learned the importance of slowing down.

Jeannie Kuang-Nguyen, MS4
University of Arkansas for Medical Sciences, Little Rock

EMERALD PARK, LITTLE ROCK, AR

JEANNIE KUANG-NGUYEN

Wellness and mental health come from achieving balance in life. In the emergency department, having to make critical decisions on patients' life-threatening conditions places you on one extreme of the spectrum. The wilderness is my way of finding the antidote to this stress and the harmony needed to feel balanced. The outdoors allows me to reset and to just *be*. It gives me the opportunity to connect to a cosmic perspective and to be at peace with existing in the world. Because of this, I can proceed without self-criticism and be okay with the flow of nature and life itself. Once I find this harmony, I am refreshed and grounded and am better able to treat my patients holistically.

Brian Hilands, DO, PGY-III
Inspira Health Network, New Jersey

APPALACHIAN TRAIL, VA

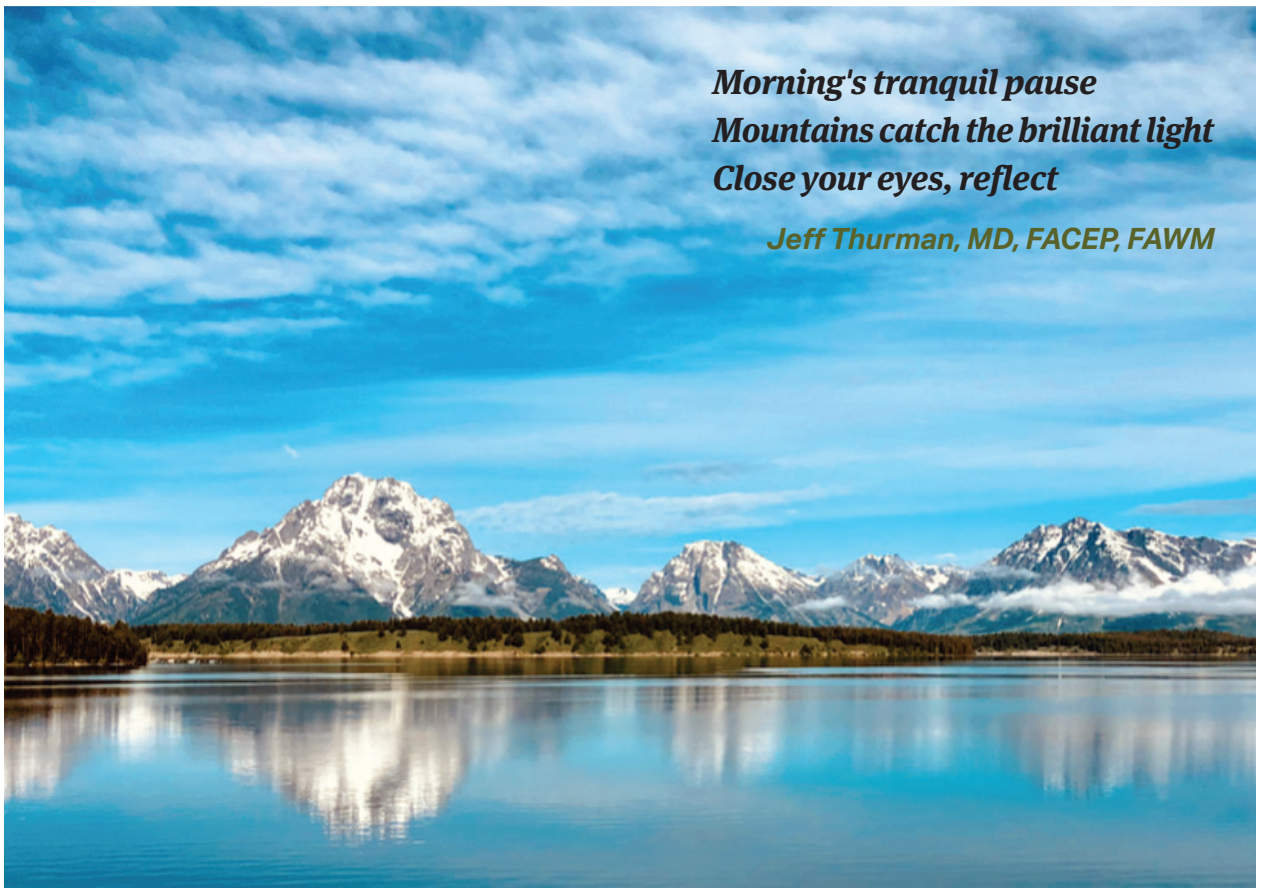
TAYLOR HASTON

I think it is important to remember how strong we are as emergency physicians, feeling everything there is to feel on that front line, while also remembering how strong we are as human beings. We stand tall, chin up with eyes wide open in order to even be aware of our surroundings. This naturally leads to countless opportunities that make it easier for us to recognize just how much exists in this big, beautiful world that has the ability to spark happiness and leaves us truly feeling alive. Perhaps then, the most challenging part is remembering how that spark of happiness felt. We must hold tight to that memory and feed that spark often so it does not extinguish.

Thankfully, the wilderness gives us millions of potential sparks each and every day. Tiny details and inexplicable miracles we see in the sky, the landscapes and mountains that leave us in awe, the rhythmic vibration felt when a herd of elephants cross a riverbed together in the evening that makes us think it was actually a well-choreographed dance, and the simple act of the ocean greeting the sand at sunrise that triggers the smell of saltwater and reminds you of the vastness of the ocean and how beautifully complex its marine life is, just below the surface. This is the wilderness.

These feelings and experiences are our life fuel. They pick us up, they keep us going, they ground us and they keep us feeling as "normal" as possible during very abnormal times. They keep us childlike in the best way, they pique our curiosities and help connect us with others as well as ourselves. The wilderness gives us hope and strength, and gives us a reason to keep fighting through hard times and hard shifts; it ultimately brings us back "home."

Taylor Haston, DO
Chair, ACEP Wilderness Medicine Section



GRAND TETON NATIONAL PARK, WY

JEFF THURMAN

ARCHES NATIONAL PARK, UT

MEGAN BARTHELS

Exploring the outdoors serves as a lens to focus the chaos in life for me; it allows me to return my focus to what is important in life. Similarly to this picture (above), where the landscape goes for miles and miles but the rocks allow you to focus in on one specific area to explore, I find that spending time in the outdoors allows me to break away from many of the excess thoughts and worries that plague me on certain days and focus on the things in life that bring me joy and peace. Like the rocks in the picture, the outdoors center my attention on the things that I value.

Megan Barthels, MS4
Medical College of Wisconsin–Green Bay

I was in the mountains of the Peruvian Andes, two days into the Salkantay Trek. We had woken early that morning to begin the short day hike up to Humantay Lake, and I was thinking about my grandmother. Thousands of miles away from my family, it was difficult to comprehend that this fierce, independent, fiery woman, who had made a life out of saying no to gender roles and yes to adventure, was no longer here.

As we came over the crest of the mountain and the lagoon opened up in front of us, bounded on either side by the towering peaks of Salkantay and Humantay, I was struck by the sensation of togetherness. My grandmother had been here, in this exact spot, decades earlier—I had grown up admiring the photos on her wall. She had climbed these same hills, scrambled over these same boulders, stopped and stared at this same stunning view. Though we were not together at the moment her soul left her body, we were here together now, across time, linked by the permanence of this wonderful wilderness and our love for it. I built a small cairn next to the lake, one of many along the rocky bank, and I left it there as a crude statue to my grandmother and to the power of this place to connect our spirits. Whatever happened, wherever I might be in whatever time, we were always here together.

Sophie Karwoska Kligler, MS4
Icahn School of Medicine at Mount Sinai, New York

PERUVIAN ANDES

SOPHIE KARWOSKA KLIGLER

OCEAN CITY, NJ

AMY ONDEYKA

I think one overlooked treatment for burnout is animals. My dog, Sawyer, has the uncanny ability to wipe the slate clean after a horrible shift. He is a constant reminder to live in the moment and enjoy life to the fullest. We should be so lucky to have even an ounce of that attitude.

Amy Ondeyka, MD, FACEP
Inspira Health Network, Vineland, New Jersey

I always forget how happy I am when I'm outside. It can feel hard to plan, to pack, to get moving. But once I'm out, that always changes. My worries melt away as I give myself permission to be here and in this moment. Being out in nature and seeing the beauty of the world just reminds me of how lucky we are to be here and how full of wonder the world is.

Adrian A. Palmer, MS4
Marian University College of Osteopathic Medicine, Indianapolis

WILLOW LAKE, CO

ADRIAN A. PALMER

INTERESTED IN WILDERNESS PHOTOGRAPHY?

Every year, **ACEP's Wilderness Medicine Section** hosts a photo contest. Learn more about the section and admire the beautiful submissions from the past few years at **www.acep.org/wilderness**.

The Beauty of a Break

Two emergency physician moms reflect on how they found peace through the pause

"Healing must feel something like this."

—Janienne Kondrich, MD, Weill Cornell Medicine, NY

I'm cooking dinner while my nine-year-old daughter fills me in on the day's highlights. She and her older sister recently returned to in-person school in New York City. Without reprieve from COVID fears or return of a remote learning option, I had homeschooled them most of the second year of the pandemic. Despite the obvious challenges that accompany acting as a fourth and sixth grade educator within the confines of a two-bedroom apartment, all while working full-time as a pediatric emergency physician, I absolutely loved it. Although there are countless things the pandemic has taken from us, it has given me the gift of time with my girls.

My older daughter was only six weeks old when I returned to my final year of residency. My husband and I welcomed a second child less than three years later while I was in fellowship; this time I had eight weeks at home. After the birth of both girls, the demand was at first physical: sleep a few hours per night, remain on your feet while you recover from growing and delivering a human, maintain your milk supply because at least— *at least*—it's one way you can still nurture your baby.

As they grew older, the challenge morphed into a psychological one. The following years brought a tension between dedication to my career and the knowledge I was missing key moments of their childhoods. I continued riding on the merry-go-round familiar to many that next week will be better, less busy.

The pandemic brought all of it to an abrupt halt—no more sports practices, birthday parties, or playdates. Previously, in the brief pockets of time when I was home, they were out. Now, I had more time with my girls than I ever had before. And somehow, amid the fear and uncertainty, and the increased and changing demands at work, I found the peace at home I had been looking for.

Over the last couple years, we baked many loaves of banana bread, went on nighttime walks to see the illuminated Manhattan skyline, watched movies, and played board games. Interspersed among it all were conversations about friendship, life, and predictions for the fourth season of *Stranger Things*. I am involved in what they are learning, and we cuddle at bedtime most nights. We are more connected now than ever before.

The world steamrolls ahead to return to "normal" pre-pandemic life, a delusive ideal. I refuse to ignore the lessons of the last two years. As my daughters grow, so do I. We can never get time lost returned to us; all we have is now. Healing must feel something like this.

JANIENNE KONDRICH

Dr. Janienne Kondrich smiles with her husband, Erik Jensen, and their daughters Ella and Evangeline.

NICOLE GERBER

Dr. Nicole Gerber poses with her daughter Eliana, son Max, husband Jon, and baby Hannah.

"We learned to just sit"

—Nicole Gerber, MD, Weill Cornell Medicine, NY

I was a busy working mom of two young kids, and I didn't know how to have unscheduled time. Weekends when I wasn't working were spent going to museums or parks—going somewhere, never just sitting at home. And then, we couldn't go anywhere. I felt trapped.

I made schedules and tried to come up with activities, nothing taking as long as I planned. When you are two years old, it only takes two minutes to color a picture, not the 30 minutes I tried to allot to the task. A week went by. Every minute at home felt like an hour; at work, every minute felt like a war zone. The patients just kept coming in—COVID-like illness, cough with hypoxia, fever and cough. When would it be my turn? Would I leave my children motherless? Would I bring it home and sicken my family? I had obsessive personal protective equipment and decontamination rituals before returning home. At home, the drag of time.

Until one day, time began to move normally again. We settled into a routine. A little fresh air. Reading some books. Play time. Unscheduled play time. (And let's not lie, lots of TV and iPad time). And we grew comfortable with each other and the lack of plans. I came to relish the opportunity to spend time with my children.

I was so relieved when schools and daycares reopened. I fervently hope they never close again. But as the world began to re-open, we realized we didn't have to go somewhere. We learned to just sit with ourselves. For that, I will always be grateful.

MIPS 2023: Prepare Now to Avoid Financial Penalties

by MICHELLE P. LIN, MD, MPH, FACEP and BILL MALCOM, MS, MBA, PMP

The Medicare Access and CHIP Reauthorization Act (MACRA), passed in 2015, was a transformational law. It eliminated the flawed sustainable growth rate formula (SGR) that was used to set Medicare physician payments and created a new quality performance program in Medicare called the Quality Reporting Program (QPP). The QPP includes two participation tracks, the Merit-based Incentive Payment System (MIPS) and Advanced Alternative Payment Models (AAPMS). Most emergency physicians are in the first track, MIPS, as they do not meaningfully participate in an AAPM, like an accountable care organization (ACO) initiative. MIPS includes four performance categories: quality, cost, improvement activities, and promoting interoperability (formerly meaningful use). Performance on these four categories (which are weighted) roll up into an overall score that translates to an upward, downward, or neutral payment adjustment that providers receive two years after the performance period. MIPS was designed to be budget neutral, and as result of this, the program requires imposing financial penalties on low-performing clinicians' Medicare reimbursement to pay for incentives for high-performing clinicians.

What's Happening with MIPS in 2023?

Because of the COVID-19 pandemic, CMS delayed the penalty phase-in and substantive bonus payments, resulting in neutral payment adjustments for the 2020 and 2021 performance years. CMS also approved the Extreme and Uncontrollable Circumstances exclusion for clinicians impacted by COVID-19 for 2022. But, in 2023, the MIPS program likely will resume with full implementation, with up to 9 percent penalties and bonuses for up to half of eligible clinicians.

By design, the 2023 performance year will determine clinicians' 2025 Medicare Part B payments. In 2025 (payment year), the MIPS program is scheduled to penalize half of the eligible clinicians and reward the other half with bonuses, based on a MIPS score (zero to 100) calculated from the annual submission of 2023 performance data. Implementing a qualified MIPS reporting process can take several weeks, so now is the time to prepare.

The maximum penalty for the 2023 performance year is 9 percent, which is scaled based on the clinician's MIPS score. Based on the 2021 Final Rule, clinicians will need to score at least 75 (median score) in 2023 to avoid a penalty, with scores above this mark resulting in bonuses. Simply put, CMS expects about half of all clinicians to fall below 75 and receive a penalty.

Will My Group and I Receive a Penalty or a Bonus?

Eligible emergency physicians face several challenges because of an unbalanced playing field in the MIPS program compared to other specialties. First, the most common method for MIPS participation is through a Qualified Registry using CMS-approved, public domain quality measures. However, the public quality measures are more applicable to primary care and require near-perfect performance to obtain even a nominal score. Further, starting in 2022, 30 percent of the MIPS score will be calculated internally by CMS from a "cost score" based on submitted claims. To date, CMS has not provided any insight into how this "cost score" is calculated, so how you and your group will score is impossible to predict. Groups can estimate their total scores by incorporating "cost scores" from a prior year's performance and combine that with the estimated quality measure scores from the QR or QCDR; however, given the unknown methodology, this approach may not be accurate. Thus, it will not only be harder to score well, but also more challenging to anticipate how your Medicare payments will be impacted.

Should We Report as a Group or as Individuals?

Under MIPS, clinicians may submit as individuals or groups under the same Tax Identification Number (TIN). When reporting as an individual, the MIPS score received only applies to the individual reporting clinician. When reporting as a group, all clinicians who use that TIN receive the same score and payment adjustment based on the entire group's performance.

Historically, group submissions score higher than individual submissions, so most groups opt for this method to improve their score. Having advance insight into individual and group MIPS scores (whether they are above or below 75) can be used strategically to minimize penalties or maximize bonuses.

However, given the lack of insight into the 30 percent accounted for by the cost score, it becomes higher risk to report as a group in 2023. For example, suppose a group estimates their MIPS score is above 75 and submits as a group, but ultimately (because of the cost score or other factors) receives a MIPS score below 75. In that case, every clinician in the group receives a penalty in the 2025 payment year.

Conversely, suppose a group estimates their MIPS score to be below 75. They may choose to submit as individuals so only the eligible clinicians take the penalty and non-eligible clinicians receive a neutral adjustment. However, if they later discover they would have scored above 75 had they filed as a group, the group effectively "opted out" of bonuses for non-eligible clinicians (under the TIN) and likely secured lower scores at the individual level for the eligible clinicians.

Are There Other Options to Participate in QPP Outside of MIPS?

Participation in the QPP is mandatory for all clinicians receiving Medicare reimbursement.

1. Clinician groups can participate in QPP as part of an advanced alternative payment model track—for example, by reporting as a member of an ACO, since AAPMs are not subject to the same financial penalties as MIPS. Historically, many emergency physicians have been excluded from APMs or ACOs. In addition, reporting as an advanced APM requires advanced planning, time, and resources.
2. Groups might also participate using their hospital's Value-Based Purchasing (VBP) program scores. Historically, some EM groups do well through this program, but how the VBP score translates into a MIPS score is not revealed by CMS until after MIPS submissions.

QR/QCDR Participation is Costly. What Can I Do to Minimize Losses?

Emergency physician groups have several complex considerations in the 2023 performance year to minimize financial loss or maximize financial bonuses in 2025. For example, groups with fewer eligible clinicians may have less exposure to both penalties or bonuses, which may not outweigh the substantial resources needed for quality measurement and reporting.

If a group's objective is to simply minimize financial losses (including time and resources invested into QR/ QCDR reporting), they might choose to merely submit "improvement activities" directly to CMS for eligible clinicians and not report any quality measures as individuals. Eligible clinicians would likely receive a penalty for 2025, but it would probably be less than the 9 percent maximum penalty.

In addition, some EM billing companies offer quality registry reporting as part of their service. QRs may be less resource intensive; however, QR reporting is limited to public domain quality measures which are less applicable to EM. Therefore, reporting through QRs may not offer confidence for a bonus-eligible score given competition with clinicians from other specialties on non-emergency medicine measures. However, reporting of measures through the QR may reduce the penalty exposure of a group.

How Can We Maximize Payments and Bonuses?

If a group's objective is to maximize financial gain, the MIPS score and resulting bonus payment must exceed the cost of the reporting mechanism used. Groups can submit data via third party intermediaries such as a Quality Registry (QR) or a Qualified Clinical Data Registry (QCDR). While QRs may be less resource-intensive, groups would need to achieve near-perfect performance relative to all clinicians participating in MIPS (across specialties) to avoid a penalty or receive a bonus. Alternately, groups may invest in reporting through a QCDR, which offers EM-specific measures as an alternative to the generic public domain measures. ACEP's Clinical Emergency Data Registry (CEDR) is one commonly used QCDRs offering custom emergency medicine focused QCDR quality measures. Historically, EM groups participating in MIPS outside of QCDRs have some of the lowest scores among MIPS-eligible clinicians.

Targeting an estimated MIPS score well above 75 would provide confidence in avoiding penalties, as well as offsetting the cost of reporting by the bonus payments received for both eligible and not eligible clinicians.

Bottom Line

We recommend group leaders carefully consider their approach to 2023 MIPS reporting *now*, well ahead of January 1, 2023. CMS is not expected to release final rule updates for the 2023 reporting year until November 2022 (proposals are released during the summer), so emergency physician groups should explore options and be prepared to act quickly. Given the recent challenges for our specialty, it will be especially important to preserve future Medicare reimbursement and avoid MIPS penalties moving forward.

DR. MICHELLE LIN serves as the current Chair of the ACEP Clinical Emergency Data Registry (CEDR) Committee. **BILL MALCOM** serves as the Program Director, Data Sciences and Quality for ACEP.

Merit-based Incentive Payment System (MIPS) Summary

- Full effect likely to occur in 2023
- 2023 reporting year will result in up to 9 percent bonuses and penalties applied to 2025 Medicare payments
- Higher threshold to avoid penalty
- 30 percent cost score remains a black box
- Implementing MIPS reporting can take several weeks—start now to be ready for 2023
- Explore options now to be ready for CMS's final rules in November 2022
- ACEP's CEDR offers a comprehensive solution for MIPS reporting

LEARN MORE

ACEP's Clinical Emergency Data Registry (CEDR) was established as a Qualified Clinical Data Registry (QCDR) in 2015 and provides a comprehensive solution for MIPS reporting at acep.org/cedr. It also provides Physician Quality Reporting System (PQRS) data, Quality Payment Program (QPP) data, Maintenance of Certification, Ongoing Professional Practice Evaluation, outcome data, and other related quality and patient safety data to meet quality improvement and regulatory requirements.

Case Report: Unintentional Ingestion of Isobutyl Nitrite Causes Nearly Fatal Consequences

Ingestion of these colloquially termed "poppers" can lead to death

by KEROLLOS SHAKER, MD; NANCY ONISKO, DO; AND KAPIL SHARMA, MD

Introduction

Isobutyl nitrite, commonly known as "poppers," is inhaled recreationally to elicit euphoria and sexual arousal. It is readily available in adult novelty shops, in video stores, and online. It is commonly advertised as "liquid air freshener" or "incense."[1] It is sold under the brand names of Rush, Super Rush, Iron Horse, Locker Room, among others.[2] When inhaled, this substance results in smooth muscle relaxation, vasodilation, and tachycardia. Ingestion, however, can be deadly.

Case Description

A 56-year-old male with past medical history of hypertension, gastroesophageal reflux disease, and alcohol use disorder presented to the emergency department with altered mental status, cyanosis, respiratory failure and hypotension. He had mistakenly ingested (rather than inhaled) 10 mL of isobutyl nitrite (Photo 1) at a nightclub and immediately collapsed. On presentation to the emergency department, his vitals were:

- Heart rate 119 bpm
- Blood pressure 86/47 mmHg
- Pulse oximetry 77 percent on nonrebreather
- Respiratory rate 20
- Temperature 34.2 degrees C

He required endotracheal intubation and dual pressor support with norepinephrine and vasopressin.

Arterial blood draw revealed a classic chocolate-brown appearance (Photo 2). An arterial blood gas revealed pH 7.08, partial pressure of carbon dioxide 41, partial pressure of oxygen 73, bicarbonate 12 and oxygen saturation of 89 percent. Additionally, his labs were significant for creatinine kinase level of 1,077 units/L, anion gap of 21 mmol/L and lactate level of 12.1 mmol/L. He had an ethanol level of 63 mg/dL, with a negative quantitative volatile screen for methanol, isopropanol, and ethylene glycol. Urine drug screen was positive for amphetamine and cocaine. His methemoglobin level on arrival was more than 31 percent (greater than the laboratory's maximum detectible level).

Three doses of methylene blue were given intravenously at a total of 2 mg/kg, and post-treatment methemoglobin level decreased to 0.7 percent. The patient developed green urine as is common after administration of methylene blue (Photo 3). Complete blood count with differential did not reveal evidence of hemolysis. The patient was extubated on hospital day three and made a full recovery.

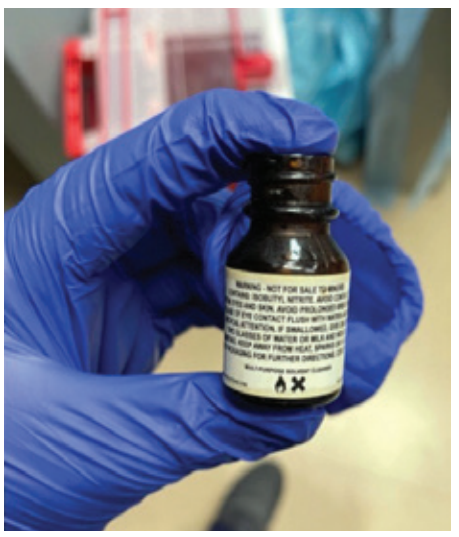


Photo 1: Isobutyl nitrite 10 mL bottle

Photo 2: Chocolate-brown blood color

NANCY ONISKO; KEROLLOS SHAKER

Photo 3: Post methylene green urine

Discussion

In 1859, amyl nitrite was reported to cause flushing of the skin on the neck and face after inhalation.[3] It was then prescribed therapeutically for managing angina in 1867.[3] Nitrites originally were available in crushable mesh-enclosed glass capsules called pearls, and when they were crushed with the fingers, a popping sound was made and they were subsequently inhaled by the patient.[3] This sound is thought to be the reason nitrites are referred to as poppers.[3]

Nitrite use enhances sexual arousal and pleasure. Inhaled nitrites are absorbed rapidly in the bloodstream, with onset of effects in seconds.[3] Metabolism is primarily hepatic via glutathione-organic nitrate reductase.[3] Given their vasodilatory effect, they relax the involuntary muscles of the vasculature, causing facial flushing, warm sensations, hypotension, tachycardia, lightheadedness and headache. Nitrite abuse is more common among homosexual men, as it is believed to dilate the anal sphincter and facilitate anal intercourse.[4] A potential life-threatening effect of large nitrite exposure is methemoglobinemia, which occurs when iron is oxidized from the ferrous (Fe^{2+}) to ferric (Fe^{3+}) state. This ferric state does not bind to oxygen and is unable to transport oxygen to the tissue, thereby leading to tissue hypoxia manifested by cyanosis, headache, weakness, central nervous system depression, seizures, coma, and death.

The mainstay therapy for treating methemoglobinemia is methylene blue, which is converted to leucomethylene blue in the presence of NADPH and NADPH methemoglobinemia reductase.[5] The leucomethylene facilitates the reduction of ferric to ferrous iron state through the NADPH reductase pathway.[5] Methylene blue is administered at one to two mg/kg of body weight intravenously over five minutes. It is important to note that methylene blue will display a spurious pulse oximeter reading owing to its blue color absorbance at 660 nm.[6] Cautious use of methylene blue in patients with G6PD deficiency should be noted as the treatment can lead to hemolysis. Alternative or adjunctive treatments include ascorbic acid and exchange transfusion.

Conclusion

Oral ingestion of isobutyl nitrite leads to life-threatening hemodynamic instability and methemoglobinemia due to its vasodilatory and oxidizing effects, respectively. Methylene blue is the mainstay treatment of symptomatic methemoglobinemia. ⊕

References

1. Nitrite "poppers." FDA. https://www.fda.gov/consumers/consumer-updates/nitrite-poppers.
2. Elgendy F, Del Rio-Pertuz G, Nguyen D, et al. "Popper" induced methemoglobinemia [published online Feb. 2, 2022]. *Proc (Bayl Univ Med Cent).*
3. Romanelli F, Smith KM, Thornton AC, et al. Poppers: epidemiology and clinical management of inhaled nitrite abuse. *Pharmacotherapy*. 2004;24(1):69-78.
4. Vaccher SJ, Hammoud MA, Bourne A, et al. Prevalence, frequency, and motivations for alkyl nitrite use among gay, bisexual and other men who have sex with men in Australia. *Int J Drug Policy.* 2020;76:102659.
5. Taylor GM, Avera RS, Strachan CC, et al. Severe methemoglobinemia secondary to isobutyl nitrite toxicity: the case of the 'Gold Rush.' *Oxf Med Case Reports.* 2021;2021(2):omaa136.
6. Kirlangitis JJ, Middaugh RE, Zablocki A, et al. False indication of arterial oxygen desaturation and methemoglobinemia following injection of methylene blue in urological surgery. *Mil Med.* 1990;155(6):260-262.

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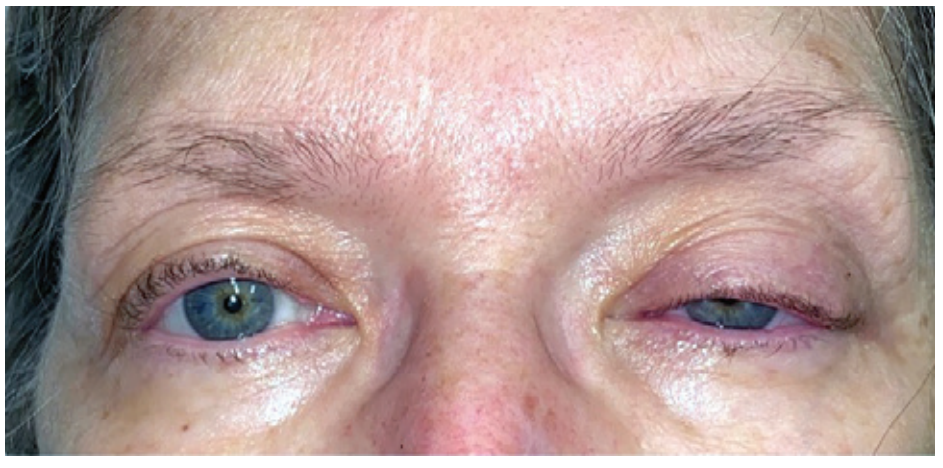

DAVID EFFRON

Patient showing signs of ptosis.

Ptosis: Opening an Eye to All Options in Patients With This Sign

by RYAN YAVORSKY, DO, AND DAVID EFFRON, MD

A 67-year-old female presented to a community emergency department with headache and left-sided ptosis. Her headache started two weeks ago and was gradual in onset. She described it as her typical migraine: a sharp pain that was worse with light and associated with nausea and vomiting. She used sumatriptan, which improved her symptoms after several days. Three days prior to her presentation to the emergency department, she developed recurrence of this headache with left-sided ptosis and left-sided facial numbness. *Scan the QR code to read the full case report online.*

DOGMA FEELS RIGHT UNTIL YOU STEP IN IT

SKEPTICS' GUIDE TO EMERGENCY MEDICINE

DR. MILNE is chief of emergency medicine and chief of staff at South Huron Hospital, Ontario, Canada. He is on the Best Evidence in Emergency Medicine faculty and is creator of the knowledge translation project the Skeptics' Guide to Emergency Medicine (www.TheSGEM.com).

EmPATH Unit for Patients Presenting with Suicidal Attempts or Ideation

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Working with your hospital's psychiatric department may help manage this population

by KEN MILNE, MD

Case: You bring up the issue *again* of boarding mental health patients for hours to days in the emergency department (ED) monthly meeting. Multiple members at the meeting confirm your concern that these patients are not getting appropriate care in a timely fashion. You wonder if there could be a way to improve access to acute mental health care.

Clinical Question: Can an emergency psychiatric assessment, treatment, and healing (EmPATH) unit decrease hospital admission and boarding time for patients presenting with suicidal ideation or after a suicide attempt?

Background: There has been a 44 percent increase in ED visits for mental health conditions between 2006 and 2014.[1] In one decade, ED visits for suicide attempts have almost doubled.[2] The mortality rate by suicide is greater in this population than the rate of mortality for patients presenting with any other ED complaint.[3]

Inadequately resourced provision for emergency mental health care is familiar to health care professionals in multiple jurisdictions, and patients can spend days in the emergency department waiting for inpatient admission.[4] Lack of access to care can have several consequences for the individual and also adds to the overcrowding issue in the emergency department.[5]

Reference: Kim AK, Vakkalanka JP, Van Heukelom P, et al. Emergency psychiatric assessment, treatment, and healing (EmPATH) unit decreases hospital admission for patients presenting with suicidal ideation in rural America. *Acad Emerg Med*. 2022;29(2):142-149.

- **Population:** Adult patients presenting to the emergency department with suicidal ideation or after a suicide attempt
  - » **Excluded:** Patients who were medically unstable, in need of co-management of a medical condition, incarcerated, actively violent or determined by the physician to be intoxicated; patients with mental health conditions other than suicidal ideation or attempt
- **Intervention:** After the implementation of an EmPATH unit
- **Comparison:** Before the implementation of an EmPATH unit
- **Outcomes:**
  - » **Primary Outcome:** Proportion of patients admitted to inpatient psychiatric unit
  - » **Secondary Outcomes:** Any admission including psychiatry, intensive care or medicine; complete versus incomplete psychiatric admission; hospital length of stay for patients with psychiatric bed requested; ED length of stay (LOS); use of restraints in emergency department; scheduled follow-up; 30-day ED return; restraint use.
- **Study Design:** Before-and-after observational study

Authors' Conclusions: *"The introduction of the EmPATH unit has improved management of patients presenting to the ED with suicidal attempts/ideation by reducing ED boarding and unnecessary admissions and establishing post-ED follow-up care."*

Results: There were 435 patients included before the establishment of an EmPATH stage and 527 patients included after. The median age was 32 years, with an almost a 50/50 male/female split. Close to two-thirds arrived as walk-ins, with the rest being brought by EMS or police, and 13 percent were identified as homeless.

Key Result: The EmPATH unit was associated with a significant reduction in psychiatric admissions.

- **Primary Outcome:** Proportion of patients admitted to inpatient psychiatric unit (direct from emergency department, via EmPath unit or by transfer)
  - » 57.1 percent before versus 27.3 percent after EmPATH implementation
  - » Absolute difference of 29.8 percent and relative ratio of 0.48 (95 percent CI; 0.40–0.56)
- **Secondary Outcomes:**There were multiple secondary outcomes. One that stood out was the reduction in ED boarding time from a mean of 16 hours to five hours.

EBM Commentary

1. **Before-and-After Study:** This was an uncontrolled before-and-after observational study.[6] An editorial by Dr. Goodacre cautions against these types of studies. One way to address this limitation of uncontrolled before-and-after study design would be to perform a stepped wedge design. This would provide more robust information.[7]
2. **Single Center:** This was a single center study done at an academic tertiary referral emergency department in Iowa and may lack external validity to other nonacademic sites in other parts of the United States.
3. **Length of Stay:** There was an observed decrease in ED LOS from 16 hours to five hours. If confirmed, this could make a significant impact on ED flow. However, the total hospital LOS for patients who had a psychiatric bed request placed did not change with the implementation of EmPATH. Although this might just be shifting the boarding problem from the emergency department to EmPATH, patients will at least be getting the benefit of a wider scope of care provided in the EmPATH unit.

SGEM Bottom Line: The implementation of an EmPATH unit has been associated with a reduction in ED LOS and psychiatric admissions in this single Iowa hospital.

Case Resolution: You suggest that emergency department leadership should start a dialog with the psychiatric department and explore the idea of implementing an EmPATH unit at your hospital.

Remember to be skeptical of anything you learn, even if you heard it on the Skeptics' Guide to Emergency Medicine.

Thank you to Dr. Kirsty Challen, who is a consultant in emergency medicine and emergency medicine research lead at Lancashire Teaching Hospitals NHS Foundation Trust, for her help with this review.

References

1. Moore B, Stocks C, Owens PL. Trends in emergency department visits, 2006-2014. HCUP Statistical Brief #227. Healthcare Cost and Utilization Project; 2017.
2. Ting SA, Sullivan AF, Boudreaux ED, Miller I, Camargo CA Jr. Trends in US emergency department visits for attempted suicide and self- inflicted injury, 1993–2008. *Gen Hosp Psychiatry*. 2012;34(5):557- 565. doi:10.1016/j.genhosppsych.2012.03.020
3. Crandall C, Fullerton-Gleason L, Aguero R, LaValley J. Subsequent suicide mortality among emergency department patients seen for suicidal behavior. *Acad Emerg Med*. 2006;13(4):435-442. doi:10.1197/j.aem.2005.11.072
4. Appelbaum PS. "Boarding" psychiatric patients in emergency rooms: one court says "no more". *Psychiatr Serv*. 2015;66(7):668- 670. doi:10.1176/appi.ps.660707
5. Nicks BA, Manthey DM. The impact of psychiatric patient board- ing in emergency departments. *Emerg Med Int*. 2012;2012:360308. doi:10.1155/2012/360308
6. Goodacre S. Uncontrolled before-after studies: discouraged by Cochrane and the EMJ. Emerg Med J. 2015 Jul;32(7):507-8. doi: 10.1136/emermed-2015-204761. Epub 2015 Mar 27. PMID: 25820301.
7. Hemming K, Haines TP, Chilton PJ, Girling AJ, Lilford RJ. The stepped wedge cluster randomised trial: rationale, design, analysis, and reporting. BMJ. 2015 Feb 6;350:h391. doi: 10.1136/bmj.h391. PMID: 25662947.

RESIDENCY SPOTLIGHT

VIRGINIA TECH CARILION SCHOOL OF MEDICINE EMERGENCY MEDICINE RESIDENCY

Twitter/Instagram:
@vtcemergencymedicine

Location:
Roanoke, VA

Year founded:
2011

Number of residents:
35

Program length:
3 years

BRENDA MACLEAN, EM RESIDENCY PROGRAM MANAGER

VTCSOM residents strike a pose before SIM lab.

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

Experience in community, academic, and rural practices. The faculty at Carilion Clinic Emergency Medicine provide care across six emergency departments in Southwest Virginia. We have the only level 1 trauma center and pediatric emergency department (ED) in the region. Carilion Roanoke Memorial Hospital is the tertiary/quaternary referral hospital for a catchment area of 6,000 square miles with a population of 1.5 million. The hospital sees more than 90,000 annual ED visits and more than 2,000 annual trauma activations. A longitudinal pediatrics curriculum with pediatric ED shifts interspersed into ED rotations ensures residents are exposed to all seasonal variations of pediatric emergency care.

Residents also train at two other locations: Carilion New River Valley Medical Center, a community ED that sees 40,000 patients a year, and Carilion Franklin Memorial Hospital, a rural ED with 20,000 patient visits a year.

How would you describe the culture of your program?

We are committed to using the latest technology, research, and advanced medical practices to lead the region in emergency care. The combination of serving such a large community and the program's desire to serve has produces a passion and culture of education and learning. The feeling of family and camaraderie develops within the first year and grows.

Where do most graduating residents go after they complete the program?

Our mission has always been to provide residents with training opportunities they need to pursue the career path of their choice. Whether a resident wants to pursue a fellowship in critical care medicine, addiction medicine, wilderness medicine, ultrasound, or work in a small, rural hospital after graduation, we can prepare them for that.

—Timothy J. Fortuna, DO, FACEP, program director, Department of Emergency Medicine, Virginia Tech Carilion School of Medicine

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Decoding Pulmonary Embolism Evaluation in Pregnancy

How the use of D-dimer and YEARS algorithm may help pregnant patients rule out PE

by LAUREN WESTAFER, DO, MPH, MS, FACEP

Pulmonary embolism (PE) in pregnancy is quite uncommon, estimated to occur in 0.02–0.1 percent of pregnancies and accounting for approximately 0.02 percent of pregnancy-related hospitalizations.[1–3] Historically, the evaluation of pregnant patients for potential PE has been challenging. Signs and symptoms of PE can be nonspecific and may overlap with normal symptoms of pregnancy. Although we have several validated risk stratification tools for use in nonpregnant patients—such as the Wells Score, the PE Rule Out Criteria (PERC), the age-adjusted D-dimer threshold and, more recently, risk-adjusted D-dimer approaches such as the YEARS algorithm—these tools remained largely untested in pregnant patients. A 2017 review of international guidelines found that none recommended the use of risk stratification tools in pregnant patients.[4]

Further, the use of the D-dimer in pregnant patients has been controversial. It is well-established that D-dimer levels increase throughout normal pregnancies such that by the third trimester few, if any, individuals have a D-dimer below standard thresholds.[5,6] While trimester-adjusted D-dimer thresholds have been recommended by some experts, these cutoffs have not yet undergone validation.[7] Others have argued that a D-dimer is not sensitive enough in pregnancy. For example, the DiPEP study reported that the D-dimer had a sensitivity of 88.4 percent. In that study, however, more than 70 percent of patients received anticoagulation with a low-molecular-weight heparin prior to the D-dimer, which could contribute to false-negative results.[8,9] Additionally, the administration of anticoagulation prior to the diagnosis of PE is not standard practice in the United States for patients appropriate for D-dimer testing (ie, at low to intermediate risk of PE).

Given these limitations to risk-stratifying patients with potential PE, CT pulmonary angiogram (CTPA) and ventilation-perfusion scans (V/Q scans) have been the only way of excluding PE. While both of these imaging modalities are safe in pregnancy, they impart ionizing radiation to both the pregnant individual and the fetus. Further, both imaging modalities are imperfect in pregnancy and may yield indeterminate results.

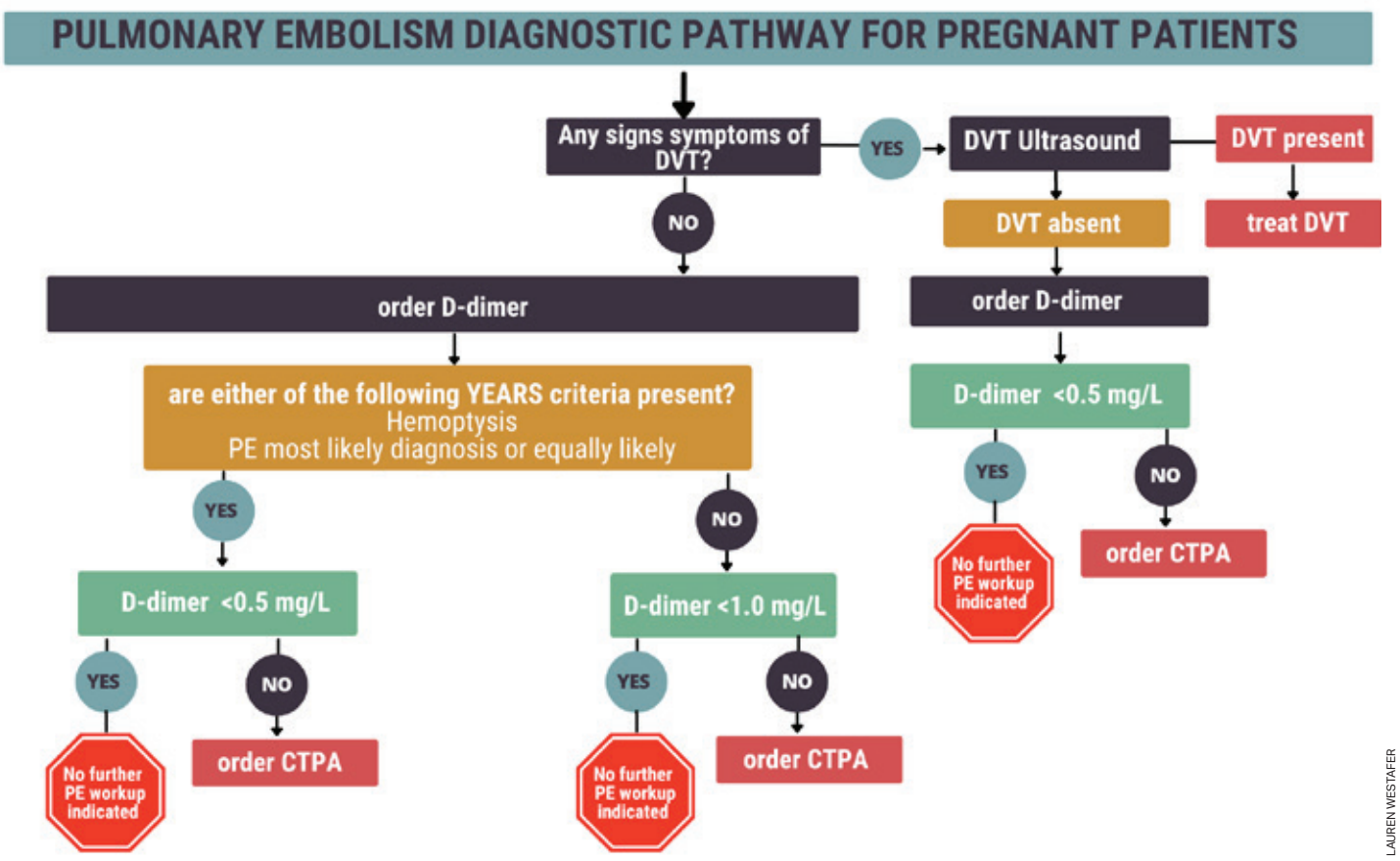

FIGURE 1: This algorithm allows more pregnant individuals to avoid imaging compared to the algorithm using the RGS, likely due to the elevated D-dimer threshold.

The Good News

Over the past few years, recent studies have provided evidence that many pregnant patients can be risk-stratified and have PE excluded without the need for imaging. A 2018 study by Righini and colleagues found that an algorithm combining the Revised Geneva Score (RGS), lower-extremity ultrasound, computed tomographic pulmonary angiogram and/or V/Q scan, and D-dimer resulted in no missed cases of symptomatic venous thromboembolism at three months. Meanwhile, imaging was avoided in 11.6 percent of the 367 cases.[10]

At nearly the same time, the developers of the YEARS algorithm published an assessment of the algorithm's performance in pregnant patients and found even more favorable results than the use of the Righini algorithm. The YEARS algorithm, an internationally validated risk-adjusted approach to the D-dimer, allows a D-dimer threshold of 1,000 ng/mL in patients who have no signs of deep vein thrombosis (DVT), have no hemoptysis and in whom PE is not the most likely diagnosis.[11–13] In a prospective study of 498 pregnant patients in which the YEARS algorithm and lower-extremity ultrasound were used, only one patient in whom PE was initially excluded was diagnosed with DVT at three-month follow-up. No patients were diagnosed with PE during the follow-up period. In addition, the YEARS algorithm allowed exclusion of PE without imaging in 65 percent of patients enrolled in the first trimester, 46 percent in the second trimester, and 32 percent in the third trimester.[14] Researchers also retrospectively evaluated the performance of the pregnancy-adapted YEARS algorithm in the Righini et al cohort and found that it was safe and would have resulted in fewer imaging studies than the RGS algorithm.[15]

> The use of the D-dimer and the YEARS algorithm have begun to appear in professional society guidelines

In fact, the use of the D-dimer and the YEARS algorithm have begun to appear in professional society guidelines. Previous iterations of guidelines varied in their recommendations to use a D-dimer, with five of seven guidelines recommending against the use of the D-dimer.[16] These guidelines, however, lacked quality prospective studies to support these recommendations. The most recent European Society of Cardiology guideline for the diagnosis of PE recommends the use of the D-dimer in conjunction with clinical prediction rules in pregnancy (level IIa recommendation—the weight of evidence is in favor of efficacy).[17] A 2021 meta-analysis of four studies supports this, reporting a sensitivity of a negative D-dimer in pregnancy of 99.5 percent (95% CI, 95.0–100%).[18] Other professional society guidelines have not yet been updated after the publication of these studies.

Potential Pitfalls

There are some potential pitfalls with this approach. First, the YEARS algorithm depends on the D-dimer assay, which has poor specificity, particularly in pregnancy. Thus, as in any population, a D-dimer should not be ordered indiscriminately and should be limited to those who would otherwise be destined for imaging due to suspicion for PE. Second, these studies did not compare performance of structured risk stratification with clinical gestalt. Although possible, it's unlikely that in the United States practice milieu clinical gestalt would result in fewer imaging studies than these algorithms. Third, few pregnant patients evaluated for PE in these studies actually had a PE—4 to 7 percent. This suggests that even with risk stratification and adjusted D-dimer thresholds, we likely overtest for PE in pregnant patients.

The Algorithm

The pregnancy-adapted YEARS algorithm can be pictured in Figure 1. This algorithm allows more pregnant individuals to avoid imaging

compared to the algorithm using the RGS, likely due to the elevated D-dimer threshold.

Overall, new data indicate it's time to stop routinely imaging pregnant patients with suspected PE. Rather, structured risk stratification with a pregnancy-adapted YEARS approach, including a negative risk-adjusted D-dimer result, can safely exclude PE in pregnant patients without the need for imaging.

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References

1. Elgendy IY, Gad MM, Mansoor H, et al. Acute pulmonary embolism during pregnancy and puerperium: national trends and in-hospital outcomes. *Mayo Clin Proc.* 2021;96(8):2102-2113.
2. Lee MY, Kim MY, Han JY, et al. Pregnancy-associated pulmonary embolism during the peripartum period: an 8-year experience at a single center. *Obstet Gynecol Sci.* 2014;57(4):260-265.
3. Jacobsen AF, Skjeldestad FE, Sandset PM. Incidence and risk patterns of venous thromboembolism in pregnancy and puerperium—a register-based case-control study. *Am J Obstet Gynecol.* 2008;198(2):233.e1-e7.
4. Wan T, Skeith L, Karovitch A, et al. Guidance for the diagnosis of pulmonary embolism during pregnancy: consensus and controversies. *Thromb Res.* 2017;157:23-28.
5. Kline JA, Williams GW, Hernandez-Nino J. D-dimer concentrations in normal pregnancy: new dignostic thresholds are need. *Clin Chem.* 2005;51(5):825-829.
6. Murphy N, Broadhurst DI, Khashan AS, et al. Gestation-specific D-dimer reference ranges: a cross-sectional study. *BJOG.* 2015;122(3):395400.
7. Kline JA, Kabrhel C. Emergency evaluation for pulmonary embolism, part 2: diagnostic approach. *J Emerg Med.* 2015;49(1):104-117.
8. Goodacre S, Horspool K, Nelson-Piercy C, et al. The DiPEP study: an observational study of the diagnostic accuracy of clinical assessment, D-dimer and chest x-ray for suspected pulmonary embolism in pregnancy and postpartum. *BJOG.* 2019;126(3):383-392.
9. Goodacre S, Nelson-Piercy C, Hunt BJ, et al. Accuracy of PE rule-out strategies in pregnancy: secondary analysis of the DiPEP study prospective cohort. *Emerg Med J.* 2020;37(7):423-428.
10. Righini M, Robert-Ebadi H, Elias A, et al. Diagnosis of pulmonary embolism during pregnancy: a multicenter prospective management outcome study. *Ann Intern Med.* 2018;169(11):766-773.
11. van der Hulle T, Cheung WY, Kooij S, et al. Simplified diagnostic management of suspected pulmonary embolism (the YEARS study): a prospective, multicentre, cohort study. *Lancet.* 2017;390(10091):289-297.
12. Kabrhel C, Van Hylckama Vlieg A, Muzikanski A, et al. Multicenter evaluation of the YEARS criteria in emergency department patients evaluated for pulmonary embolism. *Acad Emerg Med.* 2018;25(9):987-994.
13. Freund Y, Chauvin A, Jimenez S, et al. Effect of a diagnostic strategy using an elevated and age-adjusted D-dimer threshold on thromboembolic events in emergency department patients with suspected pulmonary embolism: a randomized clinical trial. *JAMA.* 2021;326(21):2141-2149.
14. van der Pol LM, Tromeur C, Bistervels IM, et al. Pregnancy-adapted YEARS algorithm for diagnosis of suspected pulmonary embolism. *N Engl J Med.* 2019;380(12):1139-1149.
15. Langlois E, Cusson-Dufour C, Moumneh T, et al. Could the YEARS algorithm be used to exclude PE during pregnancy? Data from the CT-PE-pregnancy study. *J Thromb Haemost.* 2019;17(8):1329-1334.
16. Cohen SL, Feizullayeva C, McCandlish JA, et al. Review comparison of international societal guidelines for the diagnosis of suspected pulmonary embolism during pregnancy. *Lancet Haematol.* 2020;7(3):e247-e258.
17. Konstantinides SV, Meyer G, Becattini C, et al. 2019 ESC Guidelines for the diagnosis and management of acute pulmonary embolism developed in collaboration with the European Respiratory Society (ERS): the task force for the diagnosis and management of actue pulmonary embolism of the European Society of Cardiology (ESC). *Eur Respir J.* 2019;54(3):1901647.
18. Bellesini M, Robert-Ebadi H, Combescure C, et al. D-dimer to rule out venous thromboembolism during pregnancy: a systematic review and meta-analysis. *J Thromb Haemost.* 2021;19(10):2454-2467.

EM LITERATURE OF NOTE

PEARLS FROM THE MEDICAL LITERATURE

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Recap: 2022 International Stroke Conference

Current findings and reports on stroke

by RYAN PATRICK RADECKI, MD, MS

Each year, the world's neurologists gather to unveil their latest innovations at the International Stroke Conference (ISC). Other specialties have similar conferences, but neurology exerts an outsized effect on emergency department operations as stroke treatment continues to evolve. This year's ISC, held in New Orleans, found curiosities across the spectrum of acute stroke care potentially affecting workflow, if not already reflected in the workflow of some departments.

One important clinical question facing neurologists remains the consequence of direct oral anticoagulants on acute stroke care. The current American Heart Association Stroke Guidelines advise against the use of thrombolytic therapy in patients taking novel oral anticoagulants (NOACs)—rivaroxaban, apixaban, edoxaban, dabigatran—unless specific coagulation measures are normal or at least 48 hours have passed since their most recent dose. This recommendation has effectively evolved from prior observations regarding the increase in intracranial hemorrhage associated with thrombolysis in patients concurrently taking warfarin. However, some controversy exists, as the NOACs are generally viewed as having a relatively reduced risk for intracranial hemorrhage as compared to warfarin.

Presented at ISC 2022, a retrospective evaluation of the American Stroke Association registry attempts to add further clarity to this question. Using 163,038 patients treated with alteplase between 2015 and 2020, the authors compared outcomes for patients recorded as taking a NOAC within seven days of hospital arrival with those taking no NOAC. Their primary outcome was that of safety, looking to see if patients taking NOACs were more likely to suffer symptomatic intracranial hemorrhage.

Overall, across the entire cohort of patients who were not taking an oral anticoagulant, the rate of intracranial hemorrhage following thrombolysis was 3.2 percent. For those patients having been recorded as taking a NOAC, the unadjusted rate was 3.7 percent. In the adjusted analysis, as baseline characteristics of those taking a NOAC obviously differ from those who do not, even this small difference in intracranial hemorrhage vanishes. Further analyses of secondary outcomes, such as inpatient mortality and functional outcomes, showed a mix of findings not reliably favoring one cohort or the other.

Retrospective analyses may be potentially biased in several respects. The most obvious issue here is selection bias. During the study period, 22,977 patients taking NOACs arrived at hospitals within the time frame potentially eligible for thrombolysis, but only 2,207 were treated. It is overwhelmingly likely this subset of patients recorded as taking NOACs were chosen by treating clinicians to receive thrombolysis because they demonstrated the most favorable risk/benefit profile. For example, patients selected may have missed their most recent dose of NOAC, may have had coagulation studies specifically supporting treatment with thrombolysis or may have undergone NOAC reversal with a binding agent such as idarucizumab. These important selection biases are not captured in the registry data and severely limit any potential conclusions drawn. It is absolutely not the case that any local procedures or treatment decisions ought to be changed based on these data as presented.

The next bit of curiosity presented at the ISC meeting relates to potential treatment decisions in patients considered for endovascular intervention. The idealized approach to endovascular intervention involves clot retrieval for large vessel occlusions with only a small core infarct surrounded by a large region of reduced perfusion supplied by collateral circulation. Larger core infarcts are considered, generally, on a case-by-case basis, with lower expectations of benefit and greater concern for harm. This study, RESCUE-Japan, randomized patients with stroke from large vessel occlusion and substantial infarct visible on initial imaging, as judged by The Alberta Stroke Program Early CT Score of three to five.

The most immediately apparent finding from these data indicates how dramatically poor the outcomes were for these patients. Patients randomized to medical therapy alone achieved a modified Rankin Score (mRS) of 0–3, the primary outcome for the study, only 12 percent of the time. This cohort suffered severely from disabling strokes, as a patient with mRS 3 exhibits moderate disability but is still able to walk independently. Endovascular intervention was able to improve the percentage of those achieving this primary outcome to 31 percent. Most patients achieved only mRS 2 and 3 but did so in dramatically greater proportion than those managed with medical therapy alone. It is quite likely, if your endovascular team is not already taking patients with large core infarcts for intervention, this study should tip the scales in favor of the procedure.

Finally, the CHOICE randomized clinical trial findings were presented. This trial investigated the value of adding intra-arterial alteplase to standard endovascular therapy for large vessel occlusion. In general, this addresses the concern that clot retrieval is still associated with substantial microcirculatory thrombi following large vessel intervention. In this study, those treated with intra-arterial alteplase achieved mRS 0–1 in 59 percent of the cases, while those receiving placebo did so only 40 percent of the time. Limitations include low enrollment due to the impact of the COVID-19 pandemic, but these data support cautious use of intra-arterial alteplase awaiting further confirmatory investigation.

These trials presented at the International Stroke Conference will likely affect the processes of care and outcomes of patients coming through the emergency department with acute stroke.

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THE END OF THE RAINBOW

DR. DAHLE blogs at https://www.whitecoatinvestor.com and is a best-selling author and podcaster. He is not a licensed financial adviser, accountant, or attorney and recommends you consult with your own advisers prior to acting on any information you read here.

What To Do About Low Expected Returns

Turns out that everybody's financial crystal ball is cloudy, not just yours

by JAMES M. DAHLE, MD, FACEP

Q. I read some projections that showed the returns of stocks and bonds would be very low over the next decade. What should I do differently with my investments because of that?

A. Every year there are several papers published that project future returns. The most recent paper from investing behemoth Vanguard estimated annualized, nominal (before inflation) returns of just 3.3 percent for U.S. stocks, 2.9 percent for U.S. Real Estate Investment Trusts (REITs), 6.2 percent for international stocks, and 1.9 percent for US bonds.

The first thing to know about these papers is that they are often wrong. For example, over the last decade many of these papers have called for much lower returns than what markets have actually experienced. It turns out that everybody's crystal ball is cloudy, not just yours. While valuations such as price to earnings ratios and bond yields do matter, they are pretty lousy predictors of future returns, especially in the short-term. These projections also tend to be on the pessimistic side for an obvious reason. As an investment professional making projections, if markets do better than your projections, none of your clients are mad at you. But if you call for high returns and they don't show up, the clients all take their business elsewhere. So, take any future expected return projections with a grain of salt.

These projections are also overly precise. They are reported to a tenth of a percentage point, but there is an extremely good chance they don't have the first number right, much less the second. In reality, any projection that is not a range is improperly precise. While that precision makes the projectors look smart, it is inappropriate given the difficulty of the task. Unfortunately, a proper projection would have such a wide range as to be almost useless.

However, I actually agree with the projectionists that investment returns over the next decade are likely to be significantly lower than those over the last decade. This occurrence would have significant consequences on your financial life. What should you do about it? Several things.

1. Reduce the Bite of Taxes, Fees, and Inflation

The only return that matters is your after-tax, after-fee, after-inflation return. Reduce your investment related taxes by maximizing the use of tax-protected retirement accounts like 401(k)s, Roth IRAs, Health Savings Accounts (HSAs), and 529s. Avoid short-term, rapid-fire trading so you can take advantage of lower long-term capital gains and qualified dividend tax rates. Watch your investment commissions and advisory fees. Every dollar you pay to someone else is a dollar that comes out of your investment return. You also want a significant portion of your portfolio invested into assets that tend to keep up with or beat inflation in the long run such as stocks, real estate, and inflation-indexed bonds.

2. Stay the Course

Following a written investing plan through thick and thin is a key to successful long-term investing. Chasing performance by jumping from one type of investment (asset class) to another leads to higher costs and lower returns as the investor repeatedly buys high and sells low. As a general rule, in a low interest rate and low expected return environment, all asset classes are affected more or less equally. While bond yields are particularly easy to see, the truth is that when bond yields (and thus future bond returns) are lower than historical averages, so are the returns of everything else including stocks, real estate, and speculative investments. Expecting low bond yields due to low interest rates while also expecting historical stock returns is a classic error.

3. Do Not Fear Rising Interest Rates

Investors, particularly bond investors, have an inappropriate fear of rising interest rates. While rising interest rates do decrease the value of bonds (as well as stocks), this is only a short-term effect. In the long run, a bond investor does better with higher interest rates, so long as the investor's investment horizon is longer than the duration (a measure related to the maturity length) of the bonds. All else being equal, higher interest rates are better for savers and investors (although worse for future debtors).

4. Diversify

Recognize that just about every asset class will have its day in the sun. That is not an invitation to jump from asset class to asset class, chasing performance. Instead, make sure you own several asset classes in your portfolio. Diversification is key. The Vanguard projections suggest higher future returns for international, small, and value stocks than for the U.S., large, and growth stocks that have outperformed in the last decade. Make sure your portfolio includes some of those asset classes.

5. Be Philosophical

Rather than being depressed that future returns are likely to be lower, try to be a bit more philosophical. Recognize that if past returns had not been so high (leaving more room for future growth), your nest egg would be much smaller. Higher returns on a smaller nest egg are not all that different from lower returns on a larger nest egg for most investors, although very old and very young investors will obviously prefer opposite ends of that spectrum.

6. Save More

You cannot control future returns. You might as well accept the returns the market gives you and spend your effort controlling that which is within your control, such as your lifestyle and thus savings rate. If future returns are really lower, then you will need to save more money to reach your goals.

Future returns, especially after inflation returns, are likely to be lower than in recent decades. You should still follow your reasonable, written investing plan. If you do not yet have one, develop one, either with or without the assistance of a capable financial planner.

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A Simplified Approach to Cardiogenic Shock

Careful consideration of patients with cardiogenic shock occurs at several stages in the ED

by ANTON HELMAN, MD, CCFP(EM), FCFP

Cardiogenic shock is a state of end-organ hypoperfusion due to cardiac failure. It is a type of circulatory shock resulting from severe impairment of ventricular pump function characterized by a systolic blood pressure <80 mm Hg without inotropic or vasopressor support (or <90 mm Hg with inotropic or vasopressor support) for at least 30 minutes; low cardiac output of <2 L/min/m^2 (not related to hypovolemia, dysrhythmia, hypoxemia, acidosis or atrioventricular block); and tissue hypoperfusion manifested by oliguria (<30 mL/hr), peripheral vasoconstriction or altered mental status.[1] Cardiogenic shock carries a high mortality rate; the good news is that recent U.S. observational data suggest that the in-hospital mortality from cardiogenic shock has improved from 49 percent to 37 percent over the past 15 years.[2] It is my hope that by reading this article, your understanding of cardiogenic shock, emergency department recognition, and management will help contribute to further improvements in survival.

Assessment

Assessment of end-organ perfusion, volume status, and cardiac contractility is essential in the early recognition and management of cardiogenic shock. Cardiogenic shock occurs when the reduced contractility of the ventricle impairs mean arterial pressures and cardiac output, which results in decreased end-organ perfusion. One of the reasons cardiogenic shock is challenging to recognize in the emergency department is that only about 25 percent of patients who develop cardiogenic shock are not in an obvious shock state when they initially present to the emergency department.[3] Many patients will present in occult shock or pre-cardiogenic shock. Identifying this and initiating treatment are key to preventing full-blown cardiogenic shock and death. Patients with heart failure may have a lower baseline systolic blood pressure due to heart failure medications, which can make the diagnosis of cardiogenic shock difficult. Assessment for impaired end-organ perfusion in these patients can aid in the identification of occult cardiogenic shock. At the bedside, this involves assessment of the skin (mottling, cool temperature to palpation, prolonged capillary refill), mental status, and urine output. Of note, most patients with cardiogenic shock will have cool extremities compared to most adult patients with septic shock, who will have warm extremities from vasodilatory shock.[4] An elevated lactate is suggestive of poor end-organ perfusion although the specificity is poor.[5] A rough estimation of cardiac contractility can be gleaned from a quick point-of-care ultrasound assessment (≥1/3 the diameter of the left ventricle [LV] between systole and diastole is normal) as part of a global LV function assessment.[7]

A subset of patients with pre-cardiogenic shock are those with sympathetic crashing acute pulmonary edema (SCAPE), an extreme state of rapidly progressive acute pulmonary edema in which a sympathetic surge results from decreased systemic perfusion.[6] This leads to further increases in afterload resulting in cardiovascular collapse if left untreated.

Not all patients with cardiogenic shock are volume overloaded. They may be hypovolemic, euvolemic, or hypervolemic. Determining volume status will guide whether they require diuresis or volume replacement. Volume status ultrasound assessment includes measuring LV size, jugular venous distention, and inferior vena cava size and collapsibility (diminished respiratory variation).[7] A careful fluid bolus/infusion may be required if a patient is in cardiogenic shock and deemed to be intravascularly volume depleted.

Emergency Department Management

The goals of emergency department management of cardiogenic shock should be thought of in the context of the ultimate goal of definitive mechanical treatment or temporary mechanical circulatory support. Determining the cause of cardiogenic shock is essential to optimize management.

A simple way to think of the underlying cause of cardiogenic shock is to think of four categories:

1. Cardiac ischemia (most common cause)[8]
2. Mechanical causes (such as severe aortic stenosis, endocarditis, valve rupture, free wall rupture)
3. Acute myocarditis
4. Progressive nonischemic end-stage chronic heart failure

Patients in whom you identify cardiac ischemia as the primary cause of cardiogenic shock require emergency cardiac catheterization. Those with a mechanical cause may require emergency cardiac surgery in the operating room. Those with severe acute myocarditis may benefit from temporary mechanical circulatory support, such as an Impella machine, and those with progressive nonischemic end-stage chronic heart failure may benefit from temporary mechanical circulatory support or palliation.[9]

The patient in cardiogenic shock from severe aortic stenosis deserves special attention, as any decrease in afterload, by administering nitroglycerin or ACE inhibitors for example, may be catastrophic. Particular attention should be paid to the heart rate when starting and titrating inotropes so as to avoid tachycardia. Diastolic blood pressure should be targeted slightly higher than normal to help ensure adequate forward flow. The aortic stenosis causes the left ventricle to chronically generate high pressures to overcome the high afterload. This leads to LV hypertrophy requiring higher coronary perfusion pressures. Careful maintenance of a slightly elevated diastolic blood pressure (ideally guided by an arterial line) is important to ensure adequate coronary perfusion. On the other hand, if the diastolic blood pressure is very high, there is some evidence to suggest that nitroprusside may be beneficial.[10]

The aim of emergency department management of the patient in whom you have identified cardiogenic shock should be to stabilize them to provide safe transport to the cardiac catheterization lab (if the underlying cause is cardiac ischemia), operating room (if the underlying cause is a mechanical surgical cardiac lesion) or ICU for temporary mechanical circulatory support if necessary. It is advisable to involve your interventional cardiologist, cardiovascular surgeon and/or intensivist early to plan for any definitive mechanical intervention that may be required.

Mechanical circulatory support methods include intra-aortic balloon pump, percutaneous ventricular assist devices (Impella, Tandem Heart) and veno-arterial extracorporeal membrane oxygenation. Patients with poor LV function (<25 percent) and severe hemodynamic compromise refractory to medical therapies should be considered for one of these interventions as a bridge to definitive surgical therapy or bridge to recovery. Unfortunately, there are no robust randomized control trials showing a significant mortality benefit for any of these temporary mechanical circulatory support interventions in patients with cardiogenic shock.[11–13]

Here, I outline four simple emergency department stabilization strategies:

1. **Optimize oxygenation with carefully titrated noninvasive positive-pressure ventilation (NIPPV)** and avoid endotracheal intubation if possible (as sudden removal of respiratory drive may lead to cardiovascular collapse). NIPPV reduces work of breathing and decreases intrathoracic muscle use, thereby reducing oxygen consumption. It has the additional benefit of decreasing preload and afterload, thus improving forward flow and end-organ perfusion. One common pitfall is overshooting positive-pressure ventilation in the patient with right ventricular failure, which increases right ventricular afterload and decreases cardiac output.[14]
2. **Maintain sufficient cardiac, kidney, and brain perfusion with vasopressors.** The first-line medication is norepinephrine, and the second-line medication is vasopressin to target a mean arterial pressure of 65–80.[15]
3. **Improve cardiac contractility with inotropes such as dobutamine or milrinone.** Both of these agents are inotropes and vasodilators. A recent randomized control trial showed no significant difference in in-hospital survival and major cardiac outcomes with dobutamine versus milrinone in patients in cardiogenic shock.[16] The decision to use one drug or the other should be based on several factors. If the clinical situation is such that the drug would need to be turned off quickly, dobutamine is a shorter-acting drug and would be preferred.[17] If the patient has recently taken a Beta-blocker, milrinone is preferred, as dobutamine is a Beta-1 and -2 agonist. If the underlying cause is acute cardiac ischemia, dobutamine may be a better choice, as milrinone may worsen cardiac ischemia.[18] The starting dose of dobutamine is 2–5 mcg/kg/min followed by a maintenance infusion at 2–10 mcg/kg/min. The starting dose of milrinone is 0.125–0.25 mcg/kg/min followed by a maintenance infusion of 0.125–0.75 mcg/kg/min.[16,18]
4. **Optimize volume status** as needed with crystalloid or diuretics.

Next time you are faced with a patient who presents to the emergency department in cardiogenic shock, take into consideration the following: a careful bedside clinical assessment including point-of-care ultrasound; early involvement of consultants; identification of the underlying cause; and stabilization via careful titration of NIPPV, vasopressors, and inotropes so that a patient is safe to be transported for definitive care. Taking these steps will maximize your patient's chances of survival of this challenging condition that carries a high mortality rate.

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References

1. Bates E. Cardiogenic shock. In: Jeremias A, Brown DL, eds. *Cardiac Intensive Care.* 2nd ed. Saunders; 2010:212-224.
2. Osman M, Syed M, Patibandla S, et al. Fifteen-year trends in incidence of cardiogenic shock hospitalization and in-hospital mortality in the United States. *J Am Heart Assoc.* 2021;10(15):e021061.
3. Hollenberg S. Cardiogenic shock. In: Goldman L, Schafer A, eds. *Goldman-Cecil Medicine.* 26th ed. Philadelphia: Elsevier; 2020:99,648-651.e2.
4. Standl T, Annecke T, Cascorbi I, et al. The nomenclature, definition and distinction of types of shock. *Dtsch Arztebl Int.* 2018;115(45):757-768.
5. Andersen LW, Mackenhauer J, Roberts JC, et al. Etiology and therapeutic approach to elevated lactate levels. *Mayo Clin Proc.* 2013;88(10):1127-1140.
6. Weingart S. EMCrit 1 – Sympathetic crashing acute pulmonary edema (SCAPE). EMCrit blog. 2009 Apr 25. https://emcrit.org/emcrit/scape/.
7. Koratala A, Kazory A. Point of care ultrasonography for objective assessment of heart failure: integration of cardiac, vascular, and extravascular determinants of volume status. *Cardiorenal Med.* 2021;11(1):5-17.
8. Vahdatpour C, Collins D, Goldberg S. Cardiogenic shock. *J Am Heart Assoc.* 2019;8(8):e011991.
9. Zhou N, Zhao Y, Jiang J, et al. Impact of mechanical circulatory support and immunomodulation therapy on outcome of patients with fulminant myocarditis: Chinese registry of fulminant myocarditis. *Signal Transduct Target Ther.* 2021;6(1):350.
10. Khot UN, Novaro GM, Popović ZB, et al. Nitroprusside in critically ill patients with left ventricular dysfunction and aortic stenosis. *N Engl J Med.* 2003;348(18):1756-1763.
11. Thiele H, Zeymer U, Neumann F, et al. Intraaortic balloon support for myocardial infarction with cardiogenic shock. *N Engl J Med.* 2012;367(14):1287-1296.
12. Patel MR, Smalling RW, Thiele H, et al. Intra-aortic balloon counterpulsation and infarct size in patients with acute anterior myocardial infarction without shock: the CRISP AMI randomized trial. *JAMA.* 2011;306(12):1329-1337.
13. Ouweneel DM, Eriksen E, Sjauw KD, et al. Percutaneous mechanical circulatory support versus intra-aortic balloon pump in cardiogenic shock after acute myocardial infarction. *J Am Coll Cardiol.* 2017;69(3):278-287.
14. Levy B, Klein T, Kimmoun A. Vasopressor use in cardiogenic shock. *Curr Opin Crit Care.* 2020;26(4):411-416.
15. Ventetuolo CE, Klinger JR. Management of acute right ventricular failure in the intensive care unit. *Ann Am Thorac Soc.* 2014;11(5):811-822.
16. Mathew R, Di Santo P, Jung RG, et al. Milrinone as compared with dobutamine in the treatment of cardiogenic shock. *N Engl J Med.* 2021;385(6):516-525.
17. Overgaard CB, Dzavik V. Inotropes and vasopressors: review of physiology and clinical use in cardiovascular disease. *Circulation.* 2008;118(10):1047-1056.
18. Tang X, Liu P, Li R, et al. Milrinone for the treatment of acute heart failure after acute myocardial infarction: a systematic review and meta-analysis. *Basic Clin Pharmacol Toxicol.* 2015;117(3):186-194.

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