EPIC

THE MAGAZINE OF THE GEORGIA COLLEGE OF EMERGENCY PHYSICIANS

In this issue...

GCEP

Georgia College Of Emergency Physicians

Welcome to GCEP!

Welcome to the Georgia College of Emergency Physicians—the Georgia chapter of the American College of Emergency Physicians. It's a true honor to serve as your President for 2025–2027.

Emergency medicine has never been more essential—or more demanding. Boarding, staffing and drug shortages, rising uninsurance, limited follow-up, and ongoing consolidation all shape our daily work. And yet, since our field's early days in the late 1970s, we've continually evolved to meet the moment.

We are the safety net of American health care. Emergency physicians deliver acute,unscheduled care—often lifesaving care—around the clock, for everyone who comes through our doors, especially the most vulnerable. We get it done, 24/7/365.

GCEP exists to make that work possible and better. We listen to physicians and communities across Georgia and advocate for the policies and practical solutions that improve care and outcomes. Your Board is made up of passionate, practicing emergency physicians—attendings, medical and EMS directors, researchers, and educators—who know ED operations firsthand. We also elect Councilors and Alternate Councilors who represent Georgia in ACEP's national Council, where policy is shaped for the entire specialty.

Advocacy is one of our core strengths. Our team works closely with the Medical Association of Georgia, state agencies, and leaders in the General Assembly. Most important is your voice. As a member-driven organization, our positions are developed and adopted with input from you and your elected Board.

I also want to recognize what you do every shift. You show up when your community needs you most. The work can be physically and emotionally heavy, and still you keep going—because it matters. GCEP is here to support that purpose and to support you. Surveys often talk about "burnout" alongside high "satisfaction." **The fuller story is our resilience: we endure real challenges because making a difference feels deeply meaningful.**

In the year ahead, I'll be reaching out to learn more about your experiences and how GCEP can help lighten the load—practically and persistently. The status quo is not an option, and the future is ours to shape. **Please share your ideas, your expertise, and your hopes for how we can strengthen emergency care in Georgia and refill our buckets of purpose.**

I'm grateful to serve you, and I look forward to hearing from you.

Warmly,
Shamie Das, MD, MBA, MPH, FACEP
President, Georgia College of Emergency Physicians

2025

capitol watch

A Smoother Claims Process Starts Here!

The Commissioner's Office at the Georgia Department of Insurance has just made it easier for you to file claims.

This one-pager provides step by step guidance on how to file a complaint, lists common complaints, and which department oversees the variety of plans. Click HERE to review!

Governor Kemp - Month of September Net Tax Revenues Up 1.9%

On Tuesday, October 7th, Governor Kemp released a statement regarding net tax revenue.

"ATLANTA – The State of Georgia's net tax collections during the month of September totaled nearly $3.27 billion, for an increase of $60.3 million, or 1.9 percent, compared to FY 2025, when net tax collections approached $3.21 billion for the month. Year to date, net tax revenue collections totaled $8.17 billion, for an increase of $64.5 million, or 0.8 percent, compared to September 2024, when net tax collections approached $8.11 billion.

The changes within the following tax categories account for September's overall net tax revenue increase: Individual Income Tax: Individual Income Tax collections during the month totaled nearly $1.49 billion, up from a total of almost $1.44 billion in fiscal year 2025, for an increase of $45.4 million or 3.2 percent."

To view the full press release, click **HERE.**

NEWS

UnitedHealth to Exit Medicare Advantage Plans in 109 US Counties

"NEW YORK, Oct 1 (Reuters) - UnitedHealth (UNH.N), opens new tab
said it will stop offering Medicare Advantage plans in 109 U.S. counties in 2026, impacting 180,000 members, as the company balances higher costs with reimbursement pressure in the insurance program."
"The combination of (Centers for Medicare and Medicaid Services) funding cuts, rising healthcare costs and increased utilization have created headwinds that no organization can ignore," said Bobby Hunter, who runs the company's government programs."

Read more **HERE**.

An Insurance Company is Introducing a New Threat to American Medicine

"On Oct. 1, Cigna will roll out a policy that tracks how physicians bill. It will flag those who submit a higher proportion of level four or level five visits — which get reimbursed at a higher rate — than their peers. For doctors placed under this extra scrutiny, certain claims at those higher levels may be adjusted down by one level if the billing details do not appear to justify the service. The affected codes include 99204–99205 (new patient, office/outpatient), 99214–99215 (established patient, office/outpatient), and 99244–99245 (consultations)."

To review the article, please click **HERE.**

Georgia House Study Committee Update

- Study Committee on **Cancer Care Access** led by Lee Hawkins has concluded for the summer. In result, it is obvious that communities face systemic barriers—insufficient providers, infrastructure, and funding—that lead to later diagnoses and poorer outcomes. They're studying practical interventions like mobile units, telehealth, and streamlined screening outreach, and expect policy proposals in early 2026. The report is currently going through the approval process and should be released in the coming weeks.

- Study Committee on the **Costs & Effects of Smoking** led by Sharon Cooper has begun examining the cost of smoking, including short-term and long-term health care costs, the impact on Medicaid and Medicare, childhood health costs resulting from secondhand smoke exposure and the loss of worker productivity attributed to smoking.

- Blue-Ribbon Study Committee on **Insurance Rates** led by Matt Reeves has begun and will conduct a thorough examination of the insurance industry's rate-setting practices, profit margins, claims processing and regulatory compliance to ensure that Georgia's businesses, citizens and consumers are not being subjected to unjustified rate hikes.

- Blue-Ribbon Study Committee on **Georgia's Medical Marijuana and Hemp Policies** led by Mark Newton, will continue to study and evaluate Georgia's current laws, policies and procedures surrounding medical marijuana and other cannabis-derived drugs and hemp products to ensure that there is a level playing field that protects Georgia's families and consumers alike.

- Study Committee on **Evaluating Funding for Public Health** led by Darlene Taylor has begun and will study how Georgia's public health system is structured and funded and evaluate what services such system currently provides to determine whether action by the state is necessary.

- Study Committee on **Improving Access to Internal Medicine in Underserved Areas** that is chaired by Representative Sandy Donatucci, will evaluate the most prudent and cost-effective ways to increase access to internal medicine in rural Georgia communities, with particular focus on those rural communities experiencing health transportation shortages.

- Study Committee on **Abandoned Child Placement Following Hospital Discharge** led by Katie Dempsey, will provide gap analysis of community services and resources provided by the public, nonprofit and private sectors to better support minors being discharged from psychiatric hospitalization and acute hospital emergency rooms.

To find any bill, go to www.legis.ga.gov and use the search box at the top left of the page. There is also an advanced search option that allows you to find bills by keyword or by the name of the sponsor.

For more information, please don't hesitate to contact our office at 770.435.5586 or reach us via our cell phones.

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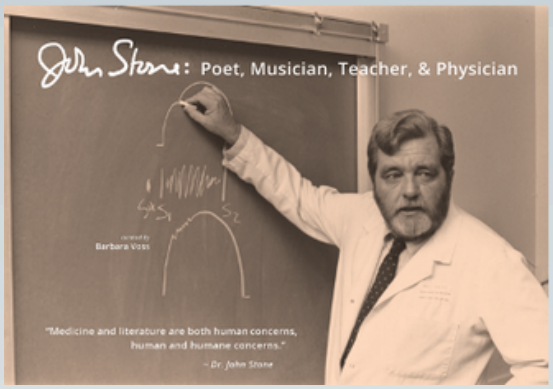
Emory University School of Medicine
Department of Emergency Medicine

Residency News



The Emory Emergency Medicine team celebrated the Residency's 50th Anniversary with events October 3-5. The team honored Dr. John Stone's legacy as the founder of the residency program, Dr. Arthur Kellermann who helped found the department, alumni of 50 yrs, and we looked forward with purpose. There were a series of gatherings across the city: the Frontiers in Advanced Emergency Care conference hosted by the Center for Advanced Emergency Care, the Rose Library's John Stone Exhibit, alumni lunch at the Carlos Museum, a comedy night, welcome receptions, Grady tours, an evening dinner/celebration, and more.

The Dr. John Stone exhibit at the Rose Library will continue on Emory's campus through January. Dr. Stone wrote five poetry books, a book of essays, an anthology of literature and medicine titled "On Doctoring," and he co-edited *Principles and Practices of Emergency Medicine*, the first textbook for Emergency Medicine. In addition to numerous Emory award, Dr. Stone was honored by Georgia Governor Zell Miller with the Governor's Award in the Humanities in 1992, and he was inducted into the Georgia Writers Hall of Fame in 2007.

The residents enjoyed a retreat at the end of September. They had a weekend full of learning, team building and exploration.

Fellowship News

Congratulations to Dr. Juhi Varshney, 2nd year Education Fellow, on her ACEP Drop the Mic award. She competed against early career faculty in two rounds and was judged to have the best presentation. As a result of winning the award, she will be speaking at ACEP next year. The official title of her talk was, "Let's have more fun on shift: an evidence-based approach." This 10-minute presentation drew evidence from the positive psychology literature and medical education literature to explore ways that emergency physicians can cultivate positive emotion while working clinically.

We are excited to welcome Dr. Brandon Friedman, the team's inaugural Global Health fellow. He is looking forward to engaging in global health work, partnering with international and local public health organizations, promoting health and research in the global setting, working alongside the EM residents, and exploring the exceptional public health training at the Rollins School of Public Health.

Distinctions

- **Dr. Jonathan Ratcliff** and **Dr. Marta Rowh** were recognized on Emory's Researcher Appreciation Day
- **Dr. Amy Zeidan** was invited to be a faculty fellow at Emory's Center for Ethics
- **Dr. Liang Liu** won the Society of Clinical Ultrasound Fellowships' Hidden Figures Award at the national conference
- **Dr. Megan Henn** is the inaugural Director of Career Advising for the School of Medicine
- **Dr. Jonathan de Olano** is chairing a working group in the SOM

Distinctions (cont'd)

- **Dr. Nkele Davis** is EM's new Clerkship Director and will serve as an interim AFD for the Medical Education Fellowship
- **Dr. Marta Rowh** is the new Fellowship Director for EM's Medical Education Fellowship. She is also a thread director for the Healthcare Excellence through Applied Advocacy and Leadership (formerly DEIRA) within the MD curriculum at the SOM
- **Dr. Laura Oh** was elected Chair of ACEP's Ultrasound Section
- **Dr. Joe Carpenter** is the inaugural Medical Director of Emergency Medicine Addiction Services for Emory Healthcare. In this new role, Dr. Carpenter will lead strategic efforts to develop and expand addiction-related clinical services within the emergency departments in collaboration with Emory Healthcare and affiliate institutions
- **Dr. Anna Yaffee** is an *Atlanta Business Chronicle*'s Women of Influence honoree. These awards honor women who have made significant strides in their careers, are making a difference in their communities, blazing a trail for others, and leaving an indelible mark on the Atlanta business community
- **Dr. Josh Wallenstein** is the Director of the Emergency Medicine Appointments, Promotion and Tenure Committee

Emory EM News

- **The Emory Observation Medicine** program posted their CDU manual and Disaster Coalition of Observation Medicine Protocols on their webpage.
- **The Southern Regional Disaster Response System** shared a webinar recording for "One Year After the BioLab Fire: Medical and Public Health Perspectives."
- **Emory Farmworker Project** will took place October 24-26, 2025, with clinics Friday night - Sunday morning. The project welcomed MD, DO, and PA volunteers.
- Dr. Ziad Kazzi and the Center for Advanced Emergency Care (CAEC) celebrated the graduation of Dr. Otar Dikhaminjia from the Emory CAEC Level 3 Clinical Toxicology Certificate Program. The ceremony was held at the start of the Third Annual Poisoning and Trauma Injury Conference in Tbilisi

Grant News

The Injury Prevention Research Center at Emory is one of 12 organizations awarded funding from the National Council on Aging and Administration for Community Living to enhance Georgia's fall prevention coalition. The center received a nearly $150,000 grant to work collaboratively with stakeholders across the state to reduce falls and minimize risks among aging adults. Learn more about the grant on the Emory News Center. IPRCE was also featured in the Emory Health Digest sharing tips for how to stay one step ahead of injury and keep yourself and your loved ones out of harm's way.

Emory EM has been awarded a 5-year, $2.88 million grant from the National Institutes of Health Justice Community Opioid Innovation Network (JCOIN) for a grant titled "Linking Individuals Needing Care for Substance Use Disorders to Peer Coaches & Across INcarceration Settings." The grant will bring together faculty from the SOM (EM's **Dr. Joe Carpenter and Dr. Alaina Steck**), Emory's Nell Hodgson Woodruff School of Nursing (Dr. Nicholas Giordano), Emory's Rollins School of Public Health (Dr. Anne Spaulding and Dr. Victoria Phillips), and Florida State University (Dr. Umed Ibragimov). The grant also highlights a strong partnership with the Injury Prevention Research Center at Emory; Dr. Carpenter and Dr. Giordano co-chair the IPRCE Drug Safety Task Force.

WABE interviewed Dr. Carpenter for his work expanding the peer recovery coaching program funded through the Georgia opioid settlement. The Emory News Center also featured a story on the coaching program and the settlement.

The Emory EM team hopes everyone is enjoying fall!

2025 Fall MCG Update

Our residents marked the start of Fall with our annual Wilderness Day in late September, led by Dr. Taylor Haston who is our Wilderness Medicine Fellowship Director. We had a large turnout of faculty, residents, and students on a land and water based kayaking race at Wildwood Park in Appling, GA to test both navigation and Wilderness Medicine knowledge. Earlier in the month of September, a majority of our senior residents traveled to Utah to attend the ACEP scientific assembly which was a great experience for them.

We have recently amended our residency curriculum with the new academic year to include a Burn ICU experience for our third-year residents at the Joseph M. Still Burn Center in Augusta, GA.

MCG Highlights

Dr. Gabby Weston, one of our chief residents, recently had a manuscript published over the summer titled *Oxygen Saturation Sub-analyses Errors in the Dominant Meta-analysis Used to Deimplement Albuterol as a Therapeutic Option for Bronchiolitis* in the journal Pediatric Emergency Care.

And finally, our EM1 orientation block is over, and all residents have fully stepped in to their respective roles as EM1s, EM2s, and EM3s. Pictured below is our annual intern welcome party held at Dr. Barrett's house.

JR Barrett, MD, FACEP
Associate Professor, Department of Emergency Medicine
Program Director, Emergency Medicine Residency
Wellstar MCG

Wellstar Kennestone Emergency Medicine Update

Leadership Transition Announcement:

A New Chapter for the Wellstar Kennestone Emergency Medicine Residency

It is with a mix of gratitude and anticipation that we announce an important leadership transition within the Wellstar Kennestone Emergency Medicine Residency program. Dr. Edward Stettner, our esteemed inaugural program director, will be stepping down from his role. At the same time, we are delighted to congratulate Dr. Juron Foreman on his appointment as the new program director.

Honoring Dr. Edward Stettner's Legacy

Dr. Edward Stettner has been the visionary architect behind our residency program's foundation. From the very start, Dr. Stettner's unwavering commitment, exceptional diligence, and deep passion for resident education have shaped the culture and trajectory of our program. His leadership has established a legacy of excellence, innovation, and compassionate patient care that will resonate for years to come.

Under Dr. Stettner's stewardship, the program has grown into a vibrant and supportive learning environment where residents are empowered to thrive, challenge themselves, and develop into outstanding emergency medicine physicians. He has led by example, inspiring both colleagues and trainees with his integrity, dedication, and genuine care for every member of our community. We extend our heartfelt appreciation to Dr. Stettner for his foundational contributions and the lasting impact he has made.

Welcoming Dr. Juron Foreman: Our New Program Director

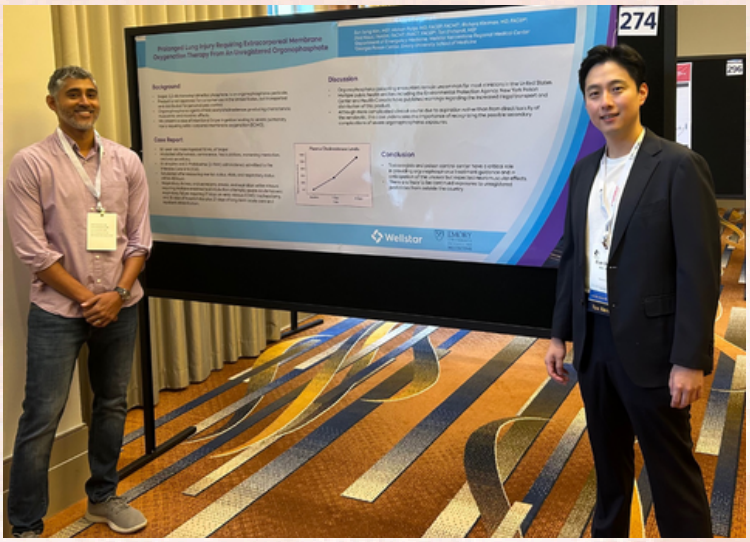
We are excited to announce that Dr. Juron Foreman will assume the role of program director. Dr. Foreman has served as assistant program director alongside Dr. Stettner since the program's inception, bringing his own energy, insight, and steadfast support to our residents and faculty alike. His longstanding commitment to education, mentorship, and clinical excellence makes him exceptionally well-suited to guide the program into its next chapter.

We offer our sincere congratulations to Dr. Foreman and look forward to the future under his leadership. His vision for collaborative growth and continued innovation promises to build upon the strong foundation established by Dr. Stettner and propel our residency program to new heights.

Faculty and Resident Achievements Update

We are pleased to share recent accomplishments and ongoing initiatives that highlight the dedication and impact of our faculty and residents.

Dr. Richard Kleiman has been appointed to the SAEM education committee and recently delivered a lecture on "Severe Pesticide Poisoning" at the Frontiers in Emergency Medicine conference hosted by Emory University School of Medicine on October 3.



Additionally, Dr. Kevin Kim (PGY-3) presented a poster at the North American Congress of Toxicology in Chicago, focusing on prolonged lung injury requiring extracorporeal membrane oxygenation therapy resulting from exposure to an unregistered organophosphate.

Our commitment to EMS excellence continues. Dr. Paige Yeager (PGY-3) has spearheaded a training initiative with Cobb County Fire and Emergency Services, introducing a new aerosolized hemostatic agent to improve prehospital care.

Multiple residents represented our program by providing medical care at the MLB All Star Game, demonstrating outstanding teamwork and clinical skill. Notably, Dr. Kaitlyn Holder (PGY-2) successfully administered prehospital blood products in collaboration with Cobb County Fire and Emergency Services, expanding life-saving interventions in the field.

In administrative leadership, ApolloMD–Wellstar fellows recently participated in valuable networking opportunities at ACEP in Salt Lake City. PGY-2 EM residents interested in developing skills in leadership and operations are encouraged to inquire about upcoming fellowship opportunities.

Finally, we congratulate Dr. Derrick Ashong for upcoming sure to be impactful presentation at the Hope for Georgia Moms second annual maternal OB roundtable, furthering our commitment to maternal health advocacy.

We celebrate these achievements and thank everyone for their continued dedication to excellence in education, patient care, and leadership within our program.

Northeast Georgia Health System Update

The past quarter has been one of continued growth and collaboration across Georgia Emergency Department Services (GEDS), Mississippi Emergency Department Services (MEDS), and our newest partner site, Morgan Medical Center. From advancing educational partnerships to refining operational processes, each division has played a vital role in strengthening emergency medicine delivery and training throughout our network.

Graduate Medical Education & Mentorship
Our Graduate Medical Education division, led by Dr. Mugele, continues to foster a culture of mentorship and clinical excellence. Residents and medical students rotating across our campuses gain exposure to high-volume, community-based emergency medicine while learning from clinicians committed to hands-on teaching.

"We've built an environment where residents feel supported, challenged, and valued," shared one GEDS physician. "The emphasis on real-world experience and teamwork has been transformative for learners and faculty alike."

Simulation & Skills Development
Our Simulation Lab continues to expand training opportunities in advanced airway management, critical resuscitation scenarios, and interprofessional communication. These high-fidelity sessions have become a cornerstone for both confidence and competence in emergent care.

"Simulation provides a safe place to make mistakes, learn, and refine judgment,"noted Dr. Nagrani. "The teamwork we're seeing in the lab translates directly to improved outcomes in the department."

Observation Medicine & Efficiency
The Emergency Observation Unit (EOU) division continues to enhance patient throughput by focusing on early disposition planning and close coordination between emergency, inpatient, and case management teams.

"Our observation division has become a bridge between emergency and inpatient care," said Dr. Davé, Chief Medical Officer. "We've seen measurable improvement in patient satisfaction and operational flow as a result."

Administrative & Operational Progress
From quality metrics to documentation accuracy, GEDS and MEDS leadership have implemented a structured approach to provider development and performance review. New initiatives include standardized evaluation meetings, mentorship programs for new hires, and interactive dashboards that track performance trends across all campuses.

"We've shifted from reactive to proactive management," said Kaitlin Loudermilk, Director of Clinical Operations. "By focusing on mentorship, transparency, and feedback, we're building consistency and trust across every department."

Looking Ahead
As we move into the next quarter, our focus remains clear—advancing education, operational excellence, and team development across all campuses. The collaboration and dedication of our clinicians, educators, and administrative teams continue to drive measurable improvements in emergency care throughout the Southeast.

Kaitlin Loudermilk, RN BSN
Director of Clinical Operations
Georgia Emergency Department Services (GEDS)
Southeastern Medical Specialists (SMS)
Mississippi Emergency Department Services (MEDS)

AU/MCG Pediatric Emergency Medicine

Just as pediatric emergency care fluctuates with the seasons, so too do the comings and goings of fellows as they enter their new lives as trainees and/or move on to new adventures. Summer onboarding, fall recruitment, winter preparation of abstracts and managing the influx of ill patients, spring preparation for the new year and saying goodbye to our all -grown- up fellows... Then start all over again.

We welcomed Gary Prusky Grinberg, DO as our newest faculty member. He graduated from our program and started this July as one of our core faculty and brings with him his PEM US fellowship training and a strong desire to proceed along a trajectory of educational leadership.

We said goodbye and good luck to Natasha Bennett, DO who joined the team at Emory and as one of their newest clinicians. We know she will do great things.

Nicole Fuller, MD, an emergency medicine- trained physician is our newest PEM fellow who is jumping in with both feet into activities and education. She was a chief here at MCG and is settling in well. She is no stranger to wilderness day at beautiful Clarks Hill Lake.

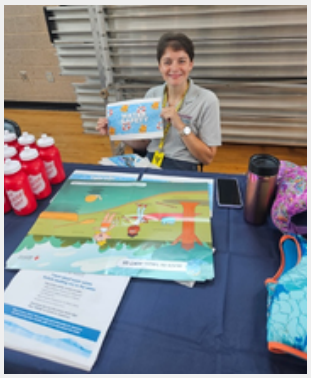
Recruitment season is in full swing. We are looking forward to a successful one. Like many programs, we have seen a decrease in the number of applicants. Like others, we worry the impact with a potential four -year EM training direction and shifting focus of pediatric RRC's to ambulatory care. We continue to support regular special interest group meetings to advise and inform interested trainees.

Faculty and Fellows Accomplishments

Kevin Allen, MD, a graduate of MCG and faculty member within the PEM Section for the last seven years was appointed Associate PEM Program Director in August.

Natalie Lane was appointed by Dr. Kathleen Toomey as a member of the Georgia Systems of Care Advsory Council (SCAC) representing the work on pediatric facility recognition.

Dr. Aimee Baer Ellington received a grant from the Auto Club Group Foundation for a Pop-Up Safety Town: Bringing Pedestrian Safety and Injury Prevention Education to Preschool Children and Families in Underserved Communities and completed the first roll out at the Kroc Center here in Augusta on September 27, 2025. Numerous nursing staff, physicians and community advocates assisted.



Publications and Presentations

- **Lane, N, Hendrix, S,** Little Cough, Big Heart: An abnormal Diagnosis for a Cough. AAP NCE, September 2025 (poster presentation)
- **Lane, N,** Will Cagle, Thad Wilkins, Wellstar MCG Health System Quality Symposium, poster presentation, March 20, 2025 (presenter).
- **Lane, N,** Healthcare Coalitions, American Academy of Pediatrics, Section on Emergency Medicine Office Hours, 3 – person panel discussion, March 11, 2025, (panel discussant).
- **Lane, N,** Children and Shock: Where Recognition and Early Intervention are Key, Region V Advisory Council Trauma Symposium, March 6, 2025, (virtual presenter).
- **Lane, N,** Pediatric Disaster Preparedness: Progress and Opportunities for Pediatricians, Morehouse Pediatric Residency Grand Rounds, January 30, 2025 (virtual presenter)
- From a Scary Imaging Scan to a Not-So-Scary Diagnosis. M Kanji, **Gary Prusky, Desiree Seeyave**. Annual AAEM Scientific Assembly, Miami FL, April 2025
- From a Scary Imaging Scan to a Not-So-Scary Diagnosis. M Kanji, **Gary Prusky, Desiree Seeyave**. Southern Regional Meeting, New Orleans LA, Feb 2025
- **Allen, K,** McCollum, D, "Safe to Work: Why Making ED Providers Safe is Essential" GEMLAC, December 2024
- **Allen, K,** Beltran, G, Orbital Myositis Last Year & Now Diarrhea & Weight Loss, Are They Related?" - Abstract/Poster Presentation at Southern Regional Meetings Joint Plenary Session, February 13, 2025
- **Allen, K,** "Evolving from a History of Racism to a Culture of Inclusion in Medicine" - Lead Speaker, Council of Residency Directors in Seattle, March 3, 2025

AAP NCE September 2025

Listening along with thousands of other attendees to President Kressly and special guestDr. Glaucomflecken! at the AAP NCE in September 2025.

Dr. Sarah Hendrix presenting her poster at the AAP

The program here at MCG is recruiting for another faculty member for the PEM section as well as the Department of Emergency Medicine. Please feel free to contact Dr. Natalie Lane with any interest in PEM (nlane@augusta.edu) and Dr. Steven Shiver in Emergency medicine (sshiver@augusta.edu).

Natalie E. Lane, MD
Section Chief/Fellowship Director Pediatric Emergency Medicine
Department of Emergency Medicine
Medical College of Georgia
Augusta University

Alcohol Withdrawal Management in the Emergency Department

Travis Mok, MD; Jonathan de Olano, MD

One of the most physiologically volatile and potentially catastrophic presentations that can be encountered in the emergency department (ED) is alcohol withdrawal syndrome (AWS). AWS is remarkably prevalent, affecting thousands in the United States annually and as such is a frequent reason for emergent presentation to the ED[1]. Epidemiological data shows an increased incidence of AWS, coupled with high rates of subsequent hospital admission and/or requirements for ICU-level care[1]. This trend suggests potential gaps in outpatient alcohol use disorder (AUD) treatment, pushing acute withdrawal management into the more expensive ED setting. For the emergency physician, this translates to encountering more patients requiring rapid assessment and intervention for a condition that is not only common but also becoming a more prominent feature of the ED workload.

The prevalence and danger associated with AWS demand prompt action by the emergency medicine physician to prevent further decompensation and physiologic instability. This article reviews the current understanding of AWS, the underlying pathophysiology of disease, and best practices for management that is applicable for the emergency medicine physician.

Case Presentation

A 48-year-old male presents to the ED via emergency medical services after being found by his roommate increasingly agitated, tremulous, and diaphoretic. His roommate states the patient is a heavy daily drinker who stopped ~24 hours ago due to nausea. Vitals on arrival: BP, 168/105 mm Hg; HR, 118 beats/min; RR, 20 breaths/min; Temp, 37.8°C; O2 Sat, 99% (room air). He is disoriented to date and exhibits gross tremor and significant agitation, intermittently pulling at his intravenous (IV) line. He is restless and states he sees "bugs crawling on the walls." Physical exam is remarkable for tachycardia, diaphoresis, and generalized tremor.

Alcohol and the Brain - The Why and How

Understanding the underlying pathophysiology is fundamental to rationalizing AWS treatment. Chronic alcohol consumption disrupts the delicate balance between the brain's primary inhibitory and excitatory neurotransmitter systems: gamma-aminobutyric acid (GABA) and glutamate[2].

In the standard functioning neurotransmitter system with inhibitory and excitatory components working in balance, GABA (or GABA agonist) binds to GABA receptors leading to a chloride influx. This chloride influx ultimately leads to neuron hyperpolarization and decreased overall excitability[3]. Alcohol acts as a GABA agonist, triggering this inhibitory effect and thus leading to the effects that are clinically seen after drinking alcohol[2,4]. Conversely, glutamate is an excitatory neurotransmitter and binds to its N-methyl-D-aspartate (NMDA) receptor to trigger an excitatory effect. Alcohol inhibits NMDA, decreasing the excitatory tone[2]. The sum of its actions is a decreased excitatory signal and an increased inhibitory one, leading to CNS depression.

As with all types of chronic exposures in the human body, there is a level of adaptation that will take place with alcohol. Chronic exposure to alcohol with subsequent chronic over-inhibition of the CNS leads to a downregulation in the number and sensitivity of GABA receptors and an upregulation in NMDA receptors[2,5]. This occurs as a part of the body's attempts at maintaining homeostasis - since there is a chronically elevated inhibitory tone, downregulating the inhibitory receptors and upregulating excitatory receptors will decrease the xenobiotic-induced inhibitory effects to standard physiologic levels. Clinically, this will be seen with increased tolerance to the inebriating effects of alcohol[5].

This effect is *dependence,* where an aspect of the normal functioning processes of the brain is *dependent* on the presence of a xenobiotic (ethanol) to achieve homeostasis[2]. The withdrawal of alcohol from the CNS leaves behind a brain and patient that is physically less capable of not only creating a sufficient inhibitory signal to maintain homeostasis, but also in supraphysiologic hyperexcitability as innumerable numbers of NMDA receptors that are no longer chronically inhibited[2].

Further complicating the patient's presentation is the exacerbation of the pathophysiology of withdrawal by electrolyte abnormalities that alcohol use can worsen. Chronic alcohol use is commonly associated with hypomagnesemia, affecting up to 30% of this population[6]. It is thought to be due to multiple factors, such as nutritional deficiency, GI losses, and alcohol-induced diuresis[6]. Magnesium has multiple roles in the body, and complications of its function from deficiency can lead to harmful cardiac and CNS manifestations.

Magnesium is a NMDA receptor modulator, acting as an antagonist at resting membrane potential[7]. A deficiency of magnesium can lead to increased NMDA activity, which may worsen the increased activity already seen with alcohol withdrawal. Magnesium also has multiple cardiovascular effects. Hypomagnesemia can result in QT interval prolongation due to decreased outward potassium flow during the action potential[8]. In one study with chronic alcohol users, hypomagnesemia had a direct correlation with QT interval prolongation[9]. Deficiency can also result in increased incidence of early after-depolarizations (EADs) which is associated with increased risk for torsade de pointes[10].

The simultaneous direct and indirect dysregulation of these neurotransmitter pathways provides a mechanistic rationale for treatments that target these pathways. It also explains the limitations of various types of treatment and provides a glimpse towards adjunct pathways for more resistant cases of AWS.

Signs of Alcohol Withdrawal Syndrome

As with many things that cloud clinical presentations and present diagnostic challenges to a busy emergency medicine shift, AWS can present along a continuum of severity, typically beginning hours after the last drink. Mild symptoms (sometimes called alcoholic tremulousness) include autonomic hyperactivity (tachycardia, hypertension, diaphoresis), tremor, anxiety, and insomnia[2]. While uncomfortable, these early signs are generally not life-threatening.

Progression can lead to more concerning manifestations. Alcoholic hallucinosis, distinct from delirium tremens by the presence of a clear sensorium, involves vivid visual, auditory, or tactile hallucinations, occurring in a significant minority of patients[2]. Alcohol withdrawal seizures occur in approximately 10% of patients and can be the first manifestation of withdrawal. These are typically brief episodes of generalized tonic-clonic seizures but can progress to status epilepticus[2].

The most severe and life-threatening manifestation is delirium tremens (DTs). This typically develops 48 to 96 hours after cessation and is characterized by a combination of marked autonomic instability (severe tachycardia, hypertension, fever), profound psychomotor agitation, global disorientation, confusion, and frank psychosis or perceptual disturbances. Unlike alcoholic hallucinosis, an altered level of consciousness defines DTs. DTs can last up to two weeks and are associated with significant mortality if not aggressively managed[2].

AWS can rapidly progress from mild discomfort to life-threatening seizures and DTs and as such early recognition is paramount. Especially in patients who have previously experienced multiple instances of AWS, a "kindling" phenomenon can occur where successive withdrawal events become progressively more severe[2,11,12]. This increasing severity is attributed to long-term alterations in neurotransmitters and their receptors within the CNS, making subsequent withdrawal episodes potentially more difficult to treat, including increased resistance to benzodiazepine therapy[12].Therefore prompt, aggressive, and appropriate ED management is vital to interrupt this progression and prevent the onset of even more severe complications. Additionally, it is important to evaluate for underlying reasons for why patients stopped drinking such as serious bacterial infections (e.g. pneumonia, meningitis, etc.) and/or other disease processes if the history is unclear.

The What - Medication Choices for Alcohol Withdrawal

All definitive treatment for AWS involves restoring adequate GABAergic stimulation or decreasing glutamine stimulation. The method of doing so differs depending on the medication used.

Barbiturates vs Benzodiazepines: A Debate

Both barbiturates and benzodiazepines directly address the underlying physiological cause of alcohol withdrawal, with different methods of doing so. While we present our own interpretation of the literature, it is important to note that they have different strengths and weaknesses when managing different variants of alcohol withdrawal, especially in the context of the Emergency Department. Crucially, **there is no evidence that there is a difference in mortality or duration of delirium tremens between benzodiazepines and barbiturates[13,14]. Any GABA-focused treatment is preferred compared to no treatment when trying to avoid adverse patient outcomes, and preferences regarding the choice between different agents come down to ease of use and safety profiles.** Understanding why one may be preferred over the other is crucial to making the appropriate choice when caring for AWS.

Benzodiazepines and Barbituates for AWS – How and Why
Benzodiazepines increase the frequency of GABA channel activation in response to endogenous GABA, thus increasing the effectiveness of the GABA that is still present[2]. It does not attenuate the effects of glutamate directly.

Barbituates work differently by increasing the duration of GABA channel activation in response to endogenous GABA, and in higher concentrations opens the GABA channel directly, providing a GABA-independent method of receptor stimulation[2,15]. Furthermore, barbituates may attenuate glutamatergic excitation by inhibiting AMPA[16] and kainate receptors, although more recent in vitro human studies have put the kainate receptor interaction in question[17]. This dual GABAergic enhancement and glutamate antagonism make barbituatesparticularly effective in severe, benzodiazepine-resistant states. Phenobarbital, a barbituate most used in AWS, also has a very long half-life (80-120 hours), providing sustained symptom control and protection against seizures with an auto-tapering effect[18]. Phenobarbital can be used as monotherapy in select high-risk patients, but more commonly, it is used as an adjunctive agent when benzodiazepines fail to achieve goal sedation/agitation[2].

Benzodiazepines are considered a preferred first-line agent compared to barbiturates[2], but multiple aspects should be taken into consideration when administering benzodiazepines or barbiturates.

Consideration #1: Benzodiazepines and barbiturates are effective at treating alcohol withdrawal and preventing serious complications. Multiple extensive studies have shown that the most serious complications of withdrawal can be effectively managed and prevented with benzodiazepines or barbiturates. A 1997 meta-analysis including 6 prospective trials showed that benzodiazepines are more effective at controlling symptoms of withdrawal compared to placebo[19]. In a 1969 study where 547 patients were randomized to chlordiazepoxide, chlorpromazine, hydroxyzine, thiamine, or placebo for treating alcohol withdrawal, the patients receiving chlordiazepoxide had the lowest incidence of withdrawal seizures and delirium tremens[20]. In a 1999 randomized controlled trial with patients experiencing alcohol withdrawal seizures, the risk of recurrent seizures was reduced from 24% to 3% after 6 hours with administration of lorazepam 2mg IM. It also reduced the need for hospital admission from 42% to 29%[21].

For barbiturates, a 1987 prospective case series noted that none of the 38 patients that presented with alcohol withdrawal seizures had another seizure in the ED after receiving phenobarbital[22]. In a 2011 randomized control trial comparing phenobarbital plus IV+PO benzodiazepines, phenobarbital was non-inferior to benzodiazepines, with a reduction of CIWA scores from a mean of 15 to 5.4 on discharge (compared to benzodiazepines with a reduction from 16.8 to 4.2 on discharge)[23].

Consideration #2: Benzodiazepines have a better safety profile: Compared to phenobarbital, certain benzodiazepines have a much faster onset of action which allows them to be easily titrated. When taken in isolation, benzodiazepines are also rarely associated with serious respiratory or cardiovascular complications (unless co-ingested with other CNS depressants)[2], and are associated with a trend towards lower rates of respiratory depression compared to phenobarbital in DTs, 1% vs 8% respectively[24].
Benzodiazepines cannot independently activate the GABA receptor at high concentrations, which other sedative-hypnotics, such as phenobarbital, are able to do[15], giving benzodiazepines a better safety margin and much wider therapeutic index. Being unable to independently activate GABA receptors means that benzodiazepines require endogenous GABA to exert an effect. Phenobarbital does not need endogenous GABA at high enough doses, leading to a narrower therapeutic index but giving it increased effectiveness in managing withdrawal symptoms in severe cases (such as in benzodiazepine-resistant withdrawal).

Consideration #3: Some withdrawal can be benzodiazepine resistant: This is a rare but known complication, which requires further management with barbiturates. It is difficult to estimate the exact rates of benzodiazepine resistant alcohol withdrawal. Among a cohort of patients with delirium tremens, which constitute a minority of cases, 9% of patients had benzodiazepine-resistant alcohol withdrawal[24]. In another cohort of patients presenting with a diagnosis of alcohol withdrawal requiring admission >24 hours and the administration of benzodiazepines specifically for alcohol withdrawal, the incidence of benzodiazepine-resistance was 18%[25]. Benzodiazepine resistance in these cases is defined as requiring ³ 40 mg of IV diazepam in one hour[25], although no formal definition has been established. One study noted that their patient population ultimately stabilized with doses of < 200 mg of IV diazepam alone within three hours with no further complications[26], which may suggest that there is more leeway in regards to benzodiazepine dosing.

Benzodiazepine Choices:

Chlordiazepoxide PO (Librium): For oral administration in patients able to tolerate PO intake with intact hepatic function, chlordiazepoxide is often preferred. Its long half-life and active metabolites provide a smooth, sustained effect, contributing to a natural self-tapering[2,27].

Diazepam IV (Valium): For rapid control of acute, moderate to severe withdrawal or in patients unable to take PO, intravenous diazepam is frequently the preferred choice. It boasts a very rapid onset of action and a long duration due to its extensive metabolism thanks to long-acting active metabolites, which aids in front-loading and sustained effect[2,27].

Lorazepam IV/IM (Ativan): Lorazepam is an intermediate-acting benzodiazepine with a key distinction: it is metabolized primarily via glucuronidation to inactive metabolites, a pathway less affected by liver dysfunction[2,6]. This makes lorazepam the preferred benzodiazepine in patients with severe hepatic impairment. It is also preferred in the elderly due to more prolonged and excessive sedation associated with longer-acting benzodiazepines[2]. However, its shorter half-life compared to diazepam may require more frequent dosing[2]. Midazolam can be used intramuscularly if IV access is unavailable, bridging to IV therapy[4].

The choice of benzodiazepine used ultimately depends individually on the patient. A consistent approach, using one benzodiazepine and titrating it appropriately, is more important than switching between agents.

Phenobarbital for Refractory Withdrawal

Despite aggressive benzodiazepine therapy, some patients may develop benzodiazepine-resistant withdrawal. This may occur when severe GABA receptor downregulation limits benzodiazepine efficacy, or when the glutamatergic surge is particularly pronounced.

Concerns include respiratory depression (especially with concurrent benzodiazepines) and hypotension.

Supportive Care

Beyond pharmacotherapy, supportive care is vital. Patients are often volume depleted and have electrolyte abnormalities such as hypokalemia and hypomagnesemia that can worsen their clinical presentation. These require immediate correction. Note that while correction of hypomagnesemia can avoid the clinical consequences of magnesium deficiency itself, it has not been shown to reduce the incidence of alcohol withdrawal seizures[28].

Thiamine parenteral administration is recommended for all patients to prevent Wernicke-Korsakoff syndrome[29]. While historically thiamine administration was recommended before dextrose due to the concern for precipitating Wernicke's encephalopathy[30], hypoglycemia should be treated emergently and not delayed by thiamine administration. [31]. Repletion of other vitamins and micronutrients should be considered.

The When - Scoring and Dosing Regimens

While the appropriate medication choice is paramount, knowing when to give it is equally important. A one-time or inappropriately scheduled dose given to a patient who does not need that medication at that time can result in worsening outcomes and prolonged hospital stays. We recommend a combination of an easily applicable scoring system (RASS) with a patient-centric dose timing strategy (symptom-triggered therapy).

Scoring Systems:

While the Clinical Institute Withdrawal Assessment for Alcohol, Revised (CIWA-Ar) is a widely known 10-item scale for quantifying withdrawal severity, it has significant limitations in the acute care setting, particularly in the ED[2]. It relies heavily on patient communication, making it challenging or impossible to use in obtunded, intubated, delirious, or uncooperative patients - even patients who cannot speak English[32,33]. It is also time-consuming and subjective, and does not incorporate vital signs which are key objective markers of autonomic instability[34].

In contrast, the Richmond Agitation-Sedation Scale (RASS) is an observer-rated scale ranging from +4 (combative) to -5 (unarousable)[2]. Originally used for ICU sedation monitoring, it is increasingly recognized as a superior tool for assessing and guiding treatment in AWS, especially for agitation and sedation levels[2,32]. RASS is objective, very quick, and applicable to non-communicative / non-English speaking patients, making it ideal for the busy ED environment. Studies indicate nursing preference for RASS due to its ease and speed, and data suggest comparable or improved outcomes when these observer-based scoring systems are used to guide therapy compared to CIWA-Ar[2]. For the emergency physician managing acutely agitated or severely withdrawing patients, RASS offers a more practical, objective, and reliable assessment to guide symptom-triggered therapy.

Table 1: Richmond Agitation-Sedation Scale[35]

Score	Term	Description
+4	Combative	Overtly combative or violent; immediate danger to staff
+3	Very agitated	Pulls on or removes tube(s) or catheter(s) or has aggressive behavior toward staff
+2	Agitated	Frequent non-purposeful movement or patient-ventilator dyssynchrony
+1	Restless	Anxious or apprehensive but movements not aggressive or vigorous
0	Alert and calm	
-1	Drowsy	Not fully alert, but has sustained (more than 10 seconds) awakening with eye contact, to voice
-2	Light sedation	Briefly (less than 10 seconds) awakens with eye contact to voice
-3	Moderate sedation	Any movement (but no eye contact) to voice
-4	Deep sedation	No response to voice, but any movement to physical stimulation
-5	Unarousable	No response to voice or physical stimulation

Dosing Regimens:

For AWS management, symptom-triggered therapy (STT) is preferred. This approach administers medication based on the patient's current symptoms and assessed severity (ideally guided by a scale like RASS or CIWA-Ar) rather than the alternative, fixed-schedule dosing.

Using STT results in significantly lower total benzodiazepine doses, shorter treatment duration, and a reduced risk of over-sedation and associated complications (like respiratory depression or iatrogenic delirium) without compromising patient comfort or increasing the risk of complications[2]. AWS severity is highly variable and dynamic, and STT allows titration to the individual patient's needs.

In comparison, the one-size-fits-all aspect of fixed-schedule dosing results in medication regimens that do not fit the often variable nature of patient presentations. There are limited situations where it could be applicable - for example in severe, rapidly decompensating patients in which it would be treated as a prophylactic approach, although this is clearly less preferred[2].

An Example ED Protocol Structure[36–38]:

1. **Initial Assessment:** Determine presence and severity of AWS. Assess agitation/sedation level using **RASS**. Consider risk factors and co-morbid conditions. Rule out alternative diagnoses.
2. **Treatment Initiation:**
   - **High Risk / Mild-Moderate Symptoms (RASS 1-2) / Able to take PO:** Initiate PO benzodiazepine (e.g., chlordiazepoxide 50-100 mg q1hr PRN (max cumulative dose 300mg over 3hrs), lorazepam 1-4 mg q1hr PRN (max cumulative dose 40mg over 4 hrs), or diazepam 10-60 mg q1hr PRN (max cumulative dose 200mg over 4 hrs), based on risk factors like liver disease or age).
     - **Maintenance dosing when RASS goal achieved and can tolerate PO:** chlordiazepoxide 50-150mg PO q4hr PRN, lorazepam 1-4mg PO q4hr PRN, or diazepam 10-60mg PO q4hr PRN)
   - **Severe Symptoms (RASS ≥ 3) / End-Organ Damage (Seizures, DTs) / Unable to take PO:** Initiate IV benzodiazepine (e.g., diazepam 10-20 mg q5min PRN (doubling every other dose, max single dose 80mg), lorazepam 2-4 mg q10min PRN (double every other dose, max single dose 8mg), or midazolam IM 5-10mg q15min PRN x2 (if no IV access, switch to diazepam when IV access is established), based on liver function/age).
     - **Maintenance dosing when RASS goal achieved and cannot tolerate PO:** diazepam 10mg IV q1hr PRN (max cumulative dose 200mg over 4 hrs), max single dose 80mg) or lorazepam 1-2mg IV q1hr PRN (max cumulative dose 40mg over 4 hrs, max single dose 8mg).
3. **Benzodiazepine Dosing Strategy: Symptom-Triggered**
   - Administer PRN doses based on **RASS** score. Goal RASS 0 to -1 (Alert and Calm or Drowsy).
   - **Front-loading:** Use higher initial doses to rapidly achieve symptom control. Double doses every other dose if goal RASS not met.
   - Avoid fixed schedules. Try to avoid switching benzodiazepines.
4. **Managing Treatment Response:**
   - If RASS goal achieved: Continue symptom-triggered PRN dosing.
   - If RASS goal NOT achieved despite appropriate escalation (e.g., high cumulative doses, like 200 mg diazepam equivalent in first 3 hours[26], not achieving goal): This represents **benzodiazepine-resistant withdrawal**.
     - Consult Medical Toxicology if available.
     - Consider **Phenobarbital** as adjunct. Continue PRN IV benzodiazepines (spaced from phenobarbital administration to assess response) and add lower dose phenobarbital IV (e.g., 65-130 mg IV PRN q30min). Transition phenobarbital to PO when tolerated (e.g., 60-120 mg PO PRN q1hr).
     - Note: Phenobarbital monotherapy (higher doses, e.g., 10-15 mg/kg loading) may be an option for patients with a known history of benzodiazepine-resistant withdrawal who have not already received large benzodiazepine doses, ideally in a monitored setting.
5. **Treatment Resistant AWS:** If patient remains significantly agitated (RASS > 3) despite maximal benzodiazepine and phenobarbital therapy.
   - Re-evaluate for alternative etiologies.
   - Consult Medical Toxicology if available.
   - Consider adjunct agents: Propofol (often post-intubation), ketamine, dexmedetomidine, or antipsychotics for isolated hallucinosis (caution with seizure threshold). Requires close monitoring, often in the ICU.
     - Note that dexmedetomidine is **not recommended as monotherapy** as it does not treat the underlying disorder but only masks it.

6. **Supportive Care:** Administer IV fluids for volume resuscitation. Correct electrolyte abnormalities (K, Mg). Administer thiamine (e.g., 100 mg parenteral initially). Consider folate and other vitamins. Provide DVT prophylaxis if indicated.
7. **De-escalation and Disposition:** Once RASS goal is maintained for a period (e.g., 24 hours), transition to symptom-triggered oral taper (e.g., chlordiazepoxide preferred if liver function allows, lorazepam if not). Taper daily dose over several days while continuing symptom-triggered PRN dosing. Plan for addiction medicine consultation if available and follow-up. Patients with mild withdrawal and no complications/comorbidities can be candidates for outpatient management after assessment.

The High-Yield Points:

- **Alcohol withdrawal syndrome is a life-threatening condition that demands rapid recognition and decisive intervention in the Emergency Department.** Your role is critical in preventing progression to devastating complications.
- **The pathophysiology involves both decreased GABA inhibition and increased glutamate excitation.** The appropriate treatment for withdrawal involves directly addressing this pathophysiology.
- **Use RASS (Richmond Agitation-Sedation Scale) to assess agitation and guide therapy, especially in acutely unwell or non-communicative patients.** It is generally quicker, more objective, and easier to apply consistently than CIWA-Ar in the ED setting.
- **Benzodiazepines are the first-line agents, but the choice matters.** For oral use, chlordiazepoxide's long half-life is beneficial. For rapid IV control, diazepam offers quick onset and a prolonged effect. Lorazepam is the safer choice in patients with liver disease or the elderly due to its simpler metabolism. Understanding their distinct pharmacokinetics and metabolism is key in appropriate use.
- **For severe or benzodiazepine-resistant withdrawal, phenobarbital is a vital adjunctive agent.** Its dual mechanism (enhancing GABA and inhibiting glutamate) and very long half-life address the broader neurochemical imbalance and provide sustained symptom control.
- **Symptom-triggered dosing, guided by RASS, is the superior strategy.** It uses less medication, shortens treatment duration, and reduces the risk of iatrogenic complications compared to fixed schedules, tailoring treatment to the individual patient's needs.
- Don't forget supportive care: rehydration, electrolyte correction, and mandatory thiamine.

Case Conclusion

Applying the principles of symptom-triggered therapy guided by RASS, our patient's RASS score of +3 (very agitated) mandates rapid intervention. He is unable to take PO. IV diazepam is initiated (e.g., 10 mg IV). His RASS remains elevated (+2 after 10 minutes), so a second dose is given (e.g., doubled to 20 mg IV). His RASS improves to 0 (Alert and Calm), but within an hour, he becomes more agitated (+1). An additional PRN dose of diazepam (e.g., 10 mg IV) is administered, bringing his RASS back to 0.

Despite aggressive benzodiazepine therapy tailored to his RASS score, his agitation escalates significantly over the next few hours (RASS +3), accompanied by worsening vital signs. He is deemed to have benzodiazepine-resistant withdrawal. Medical toxicology is consulted, and adjunctive phenobarbital is initiated while continuing PRN IV benzodiazepines. With careful titration of both agents, his agitation is controlled (RASS 0/-1), and his autonomic symptoms stabilize. Supportive care with IV fluids, thiamine, and magnesium is provided. He is admitted to a monitored setting for continued symptom-triggered therapy and gradual de-escalation, ultimately preventing progression to frank delirium tremens. Addiction medicine consultation is arranged for discharge planning.

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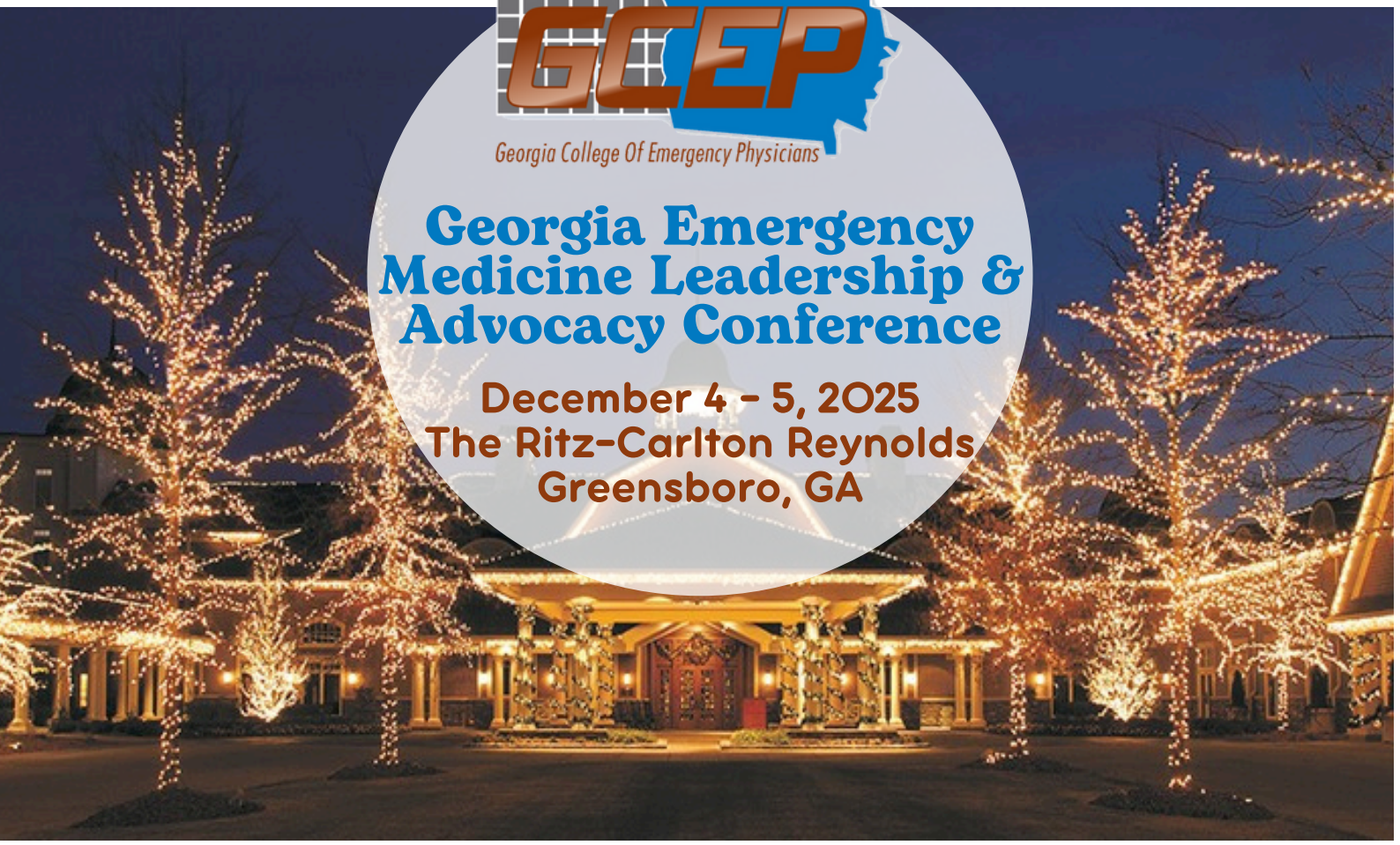

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