



EM Resident

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Exertional Rhabdomyolysis

Pediatric Hypoglycemia
Diversity: FEM@BCM
Thyroid Storm



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Emergency Medicine Residents' Association

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Exertional rhabdomyolysis is a rare but potentially fatal condition that should be considered in any athlete with significant post-exercise myalgias.

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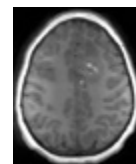
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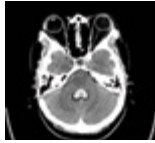


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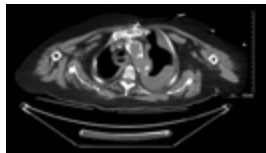


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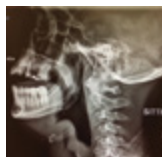


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- Dec. 15:** Applications due for EMRA rep to AFFIRM Advisory Board
- Dec. 15:** Regional Meeting funding proposals due
- Jan. 1:** Medical Student Council applications due
- Jan. 10:** Committee chair-elect applications due
- Jan. 15:** EMRA Spring Awards nominations due
- Jan. 18:** AOA Match rank order list deadline
- Jan. 30:** NRMP rank order list entry opens @ noon ET
- Feb. 4:** AOA Match Day
- Feb. 20:** NRMP rank order lists due
- March 6:** EM Residents' Appreciation Day
- March 11-14:** NRMP SOAP
- March 15:** NRMP Match Day
- March 31 – April 3:** CORD Academic Assembly and EMRA Spring Meetings, Hyatt Regency Seattle
- May 5-8:** ACEP Leadership & Advocacy Conference @ Grand Hyatt, Washington, DC
- May 13-16:** Essentials of EM @ The Cosmopolitan, Las Vegas



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Omar Z. Maniya, MD, MBA

Get to Know Your President

Omar Maniya, a second-year resident at The Mount Sinai Hospital in New York City, began his tenure as EMRA President in October. With an MBA from Harvard University, experience as the youngest Trustee of the American Medical Association, and a willingness to extend opportunities wherever possible, Dr. Maniya's leadership promises to be eventful.

Why did you run for EMRA President?

I couldn't be more excited to lead EMRA in this historic year, our 45th anniversary! As a medical student, I was involved in the AMA and served on their Board. But then I came to a few EMRA meetings and found the energy and passion and the commonalities all of us EM residents have with each other electrifying.

While EMRA has a storied history as the world's largest independent resident-run organization, I'm not here for the four letters on the wall. Rather, I'm passionate about helping us residents shape the future of Emergency Medicine, and I believe that EMRA is by far the most impactful organization that can do that.

This year we're turning our amazing clinical resources into apps, continuing our ground-breaking advocacy with the ACGME's Program Requirements, growing our leadership pipeline with 111 funded national leadership positions and a brand-new Leadership Academy for residents, and innovating our clinical resources with new books and apps. It's an exciting year, and we need all hands on deck!

As the voice of emergency physicians in training, EMRA is diligent about advocating for residents and students. What are the most important issues facing us in the coming year?

We're at a really interesting inflection point in the growth of our specialty right now, and that path we collectively choose to move forward will have unbelievably significant ramifications. Here's my take on some of the issues to watch:

Clinical

Our specialty's scope of practice is growing, and we have to navigate those growing pains. Whether it's affirming our ability to administer propofol and ketamine in the ED in the face of Anesthesiology opposition through the ACEP Procedural Sedation Guidelines, removing burdensome medical merit badge requirements for skill sets we use daily like ACLS through the Council to Oppose Medical Merit Badges (COMMB), or supporting innovative clinical research through the Emergency Medicine Foundation, EMRA is standing up for your right to practice and save lives.

Policy

Prudent Layperson is under attack from insurance companies. As you know, that's the concept that patients can't distinguish GERD from ACS by themselves, so regardless of what the final diagnosis ends up being their ED visit should be covered. Additionally, if ACA repeal comes back to life, the requirement that all insurers cover ED visits as an essential health benefit may also be at risk. Finally, we must keep an eye on evolving alternative payment models (APMs) and how they affect our reimbursement so that we can continue to provide the best care for our patients.

Workforce

Historically the need for Board-Certified Emergency Physicians far outstripped the number of them. But with the dramatic growth in the number of EM residencies that we've seen over the last decade and the proliferation of Advanced Practice Providers (APPs) in EDs, that might start to change. That's

why EMRA's actively engaged in voicing the resident perspective on ACEP's APP and Workforce task forces.

Business

The volume of ED visits has been slowly increasing for decades. It weathered the financial crisis, the development of urgent care and telemedicine. But that's starting to change. Isolated reports of falling volumes are coming out, and the competition for lower-acuity patients is intensifying. That means that we can't just assume more patients will keep showing up at our front door. We have to actually provide more patient-centric experiences (for better or worse) to stay in business and keep buying more scanners and ultrasound machines.

Wellness

We've got to figure this one out, or the unfortunate suicides, burnout, and depression will ruin our specialty. EMRA sends residents to the EM Wellness Summit and has an active Wellness Committee. For the first time next year, the SAEM Consensus Conference, where leading researchers in our specialty gather to discuss a research agenda, will focus on Wellness. EMRA plans to ensure that resident wellness is highlighted, and that we move beyond prevalence studies to actually finding positive interventions we can implement across the country.

How do you build unity and strength in this specialty?

By focusing on our mission: serving as the voice of EM residents. It's unbelievably liberating. And EMRA has been doing it for decades.

For example, recent ACGME proposals threatened to rescind the

requirement that residency programs protect core EM faculty time. We studied the issue, and quickly realized that unprotected faculty would have less time to teach us, mentor us, and incorporate us into their unique projects, so we were against it. Luckily ACEP, CORD, SAEM & AAEM came to similar conclusions, so we joined forces and made sure the ACGME heard our voice.

It was one of the most exciting and collaborative projects, with all the major organizations in Emergency Medicine coming together to move our specialty forward. And it had nothing to do with whose acronyms stood for what, all of us were in it for our members. That's what EMRA's all about, and why I believe that when we focus on our mission, the rest will fall into place.

In 25 words or less, please share your leadership philosophy.

Find rockstars (such as our committee leaders), Get out of their way (my job is to motivate), And say yes!

Tell us your own "why EM" moment — that one patient encounter or situation that made you realize emergency medicine is your calling.

In high school my aunt had a sudden-onset, worst headache of her life. In retrospect, the diagnosis was obvious. But at the time it wasn't, and a few days of trying Tylenol and Motrin later, when she presented to the ED she was in critical shape. Everyone was crying and freaking out, but a bald and soft-spoken emergency physician appeared. With a calm, cool, and collected demeanor, he told us he'd do everything to save her, and we believed him. She lived, and I couldn't wait to become that person, who could handle anything and save lives, for someone else.

What's at the top of your professional bucket list?

I fantasize about leading a rational health care system. By rational, I mean that we do things that make sense for our patients and for our physicians and staff.

For example, the ubiquitous "but the policy is..." or "the administration wants..." is usually an attempt to standardize

or micromanage health care delivery, which is a fool's errand because there is so much information asymmetry between management and the frontline providers. We experience this every time the inpatient team calls and asks why we admitted someone who can't ambulate and the person on the other end of the phone can't see how unsafe this discharge would be.

Or the crazy variation in "policies" that prevent us from doing the best things for our patients. Many Departments can't get a stress test during the typical timeframe of an ED stay or a high sensitivity troponin, but why? One of the Ten Commandments wasn't "thou shall not have stress tests in the ED," and high-sensitivity troponin testing has been shown to double the chest pain discharge rate, freeing up beds for other patients and reducing boarding.¹

Sure, there are logistical and financial hurdles to overcome, but we sent a man to the moon 50 years ago and those hurdles were much bigger!

I believe it's our job as the future of Emergency Medicine to think differently and push our departments and hospitals to become more innovative, patient-centric, and rational.

What's the most-used app on your phone?

Seamless, NYC's food delivery app. One of the hospitals we rotate at is in America's most diverse zip code, so I get to try fantastic authentic cuisine from around the world at work. Incidentally, I've also found myself using the translator app with patients who speak languages I never knew existed. ★

“I'm passionate about helping us residents shape the future of Emergency Medicine...”





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EMRA's New Board

Serve and Inspire

The Representative Council elected 5 new members to the EMRA Board of Directors in October. Meet your new directors!

A California native, Dr. Hughes became interested in emergency medicine while working as a scribe — and became interested in bettering health care for the underserved while working in local government. She brings all of that experience, along with an MBA, to her role as EMRA's next president.

Biggest challenge of residency: “Every time I tell my mom, ‘This is going to be challenging,’ she reminds me to reframe the statement, that a challenge is merely an opportunity. So... the biggest opportunity I’ve had in residency is having the space to grow. The initial expectations I had for myself starting residency were unrealistic until one of my incredible chiefs gave me insight into what may seem overtly obvious: If we were expected to come out of medical school knowing all the answers, residency wouldn’t be a thing. This is hard to accept sometimes when lack of knowledge can lead to a missed diagnosis or mistake in patient care. But the opportunity to often say, ‘I don’t know’ followed up by constant learning is *everything*.”

Top of your professional bucket list: “CEO, or rather She-E-O, of a health care system that cares for underserved patients.”

What goes on pizza? “Who needs pizza when you could have tacos... with guac. #guiltypleasure!” ★

President-Elect

Hannah Hughes, MD, MBA

University of Cincinnati



Vice-Speaker of the Council

Karina Sanchez, MD

Conemaugh Memorial Medical Center



After serving as the EMRA Program Representative for her residency and writing a resolution for Council consideration, Dr. Sanchez expanded her focus to help advocate for the needs and voices of all residents.

Biggest challenge of residency: “My biggest challenge of residency was getting in — because this then blended into a challenge of feeling equal to my peers. After graduating medical school off-cycle, not matching in EM but matching into Surgery prelim, and then starting EM intern year with off-service rotations, it had been about 2 years since I had worked in the ED as a student. This meant re-learning what it means to be an ER doc. I felt behind the curve compared to my colleagues who had just graduated and had the opportunity to do more EM electives during medical school. But, I started studying for in-service 6 months early and kept a steady pace to make sure I was catching up to my colleagues by the time of in-service”

Top of your professional bucket list: “I don’t yet have a professional bucket list. I know I will definitely move home to Los Angeles after residency to finally be with my husband, who has been waiting. I also know I will want to continue with leadership but I am still figuring out in which capacity that will be.”

What goes on pizza? “Almost anything goes on pizza. Just no pineapple, please! In fact, one of my favorite leisure activities is geeking out while having pizza, an adult beverage, and watching superhero TV shows!” ★

ACEP Resident Representative
Erik J. Blutinger, MD, MSc
University of Pennsylvania



Dr. Blutinger has served on the EMRA Health Policy Committee and the ACEP State Legislative & Regulatory Committee, bringing the resident perspective to issues that can affect practice for years to come. With a master's in health policy from the London School of Economics and experience building medical school curricula with the African Federation of EM, he offers a global approach to health care.

Biggest challenge of residency: “Minimizing the amount of stress I feel walking into each shift. Bringing snacks seems to help!”

Top of your professional bucket list: “Building an early-stage novel idea that improves the way we deliver care (in the private sector).”

What goes on pizza? “Italian Marzano whole, unpeeled tomatoes. Don't forget Olio di Peperoncino Piccante sauce, too!” ★

Director of Membership
Greg Tanquary, DO, MBA
Doctors Hospital Ohio Health

Innovation and participation marked Dr. Tanquary's service on the EMRA Education Committee – traits he will continue to foster among the membership in his new role on the board. Using advice from his grandfather (“If it's worth having, it's worth working hard for”), Dr. Tanquary has outlined an ambitious agenda to advocate for EM residents and the specialty as a whole.

Biggest challenge of residency: “Work-life balance. Residency is demanding of time and energy! It is important to prioritize time for yourself to re-energize.”

Top of your professional bucket list: “Making an impact on the educational platforms and delivery in the Emergency Medicine community.”

What goes on pizza? “I'm a simple man: pepperoni and banana peppers!” *(But if you want to talk barbecue, this Kansas City native may have some detailed advice for you...)* ★



Director of Health Policy
Angela Cai, MD, MBA
SUNY Downstate/Kings County

Dr. Cai's interest in health policy is bolstered by her MBA from the UNC Kenan-Flagler Business School. She aims to show why policy is relevant to every resident – on the local, state, and national levels. Along with the EMRA Health Policy Committee, Dr. Cai will work to strengthen resident engagement in LAC and other health policy initiatives.

Biggest challenge of residency: “Learning how to take care of our patients in south central Brooklyn in an underserved hospital helps you develop a thick skin and the best co-residents one could ask for.”

Top of your professional bucket list: “Working at CMS.”

What goes on pizza? “New Haven's ‘Clams Casino’ (as seen on *Man V Food*).” ★



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EMRA
YEAR IN
REVIEW
2018

A YEAR OF ACCOMPLISHMENTS



ADVOCACY

EMRA's advocacy efforts represent our members' passion for health care, protecting the practice of EM, and supporting EM physicians in training.

LEADERSHIP

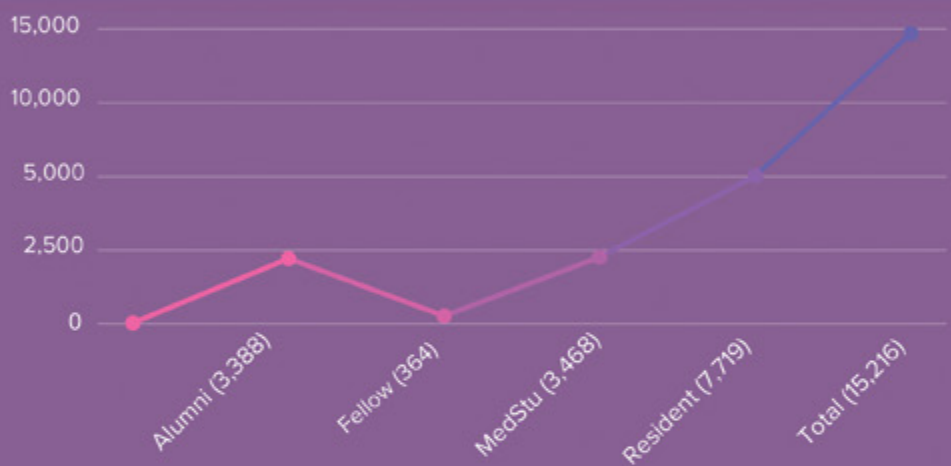
EMRA funds 111 national leadership positions for residents and medical students! Our goal is to help our members become well-rounded EM leaders.

MEMBERSHIP

EMRA's strength is in our people. Our members are the reason why we succeed as the voice of EM physicians in training.

MEMBERS 2017-2018

THIS YEAR OUR TOTAL MEMBERSHIP INCREASED BY 10.5%, AND WE COUNTED 15,216 AS A PART OF OUR #EMRAFAMILY.



FISCAL YEAR 18 ACCOMPLISHMENTS

New EMRA Events

- Chaos in the ED
- Case-Con
- Airway Stories: Life in the ED

New EMRA Resources

- EMRA EKG Guide
- EMRA Fellowship Guide
- PressorDex, 3rd Ed.
- EMRA Wellness Guide
- EMRA Splint Card
- Basics of EM, 3rd Ed.
- Basics of EM: Pediatrics, 2nd Ed.
- EMRA.org overhaul
- EMRA Clerkship Match

EMRA Leadership

- EMRA Leadership Academy
- Funded 40 new national leadership positions
- Increased funding for awards and scholarships
- Launched EMRA Reps to ACEP Sections



FISCAL YEAR 19 PLANS

New EMRA Resources

- Antibiotic Guide, 18th Ed.
- Medical Toxicology Guide
- Transgender Care Guide
- Advocacy Handbook
- Medical Student Advising Guide
- Ortho Guide
- Sepsis Management Resource
- Ultrasound Resource
- Simulation Guide
- EMRA Fellowship Match
- New app platform

FISCAL HEALTH

Scholarships awarded: \$79,405
Net revenue over expenses: \$41,770
Investment return: 9.6%
Total assets: Up 10%



EMRA WORKING FOR YOU!

For almost 45 years, EMRA has been the voice of physicians-in-training and the future of our specialty. We continue to raise up leaders in health policy, research, medical education, government, and much more. This year, we created and funded 40 additional national leadership positions for residents and medical students.

In addition to leadership opportunities, we continue to create unique resources. EMRA launched the new EMRA.org, which is mobile-responsive and allows members to automatically join or leave EMRA Committees as their interests evolve throughout their training. We introduced EMRA Clerkship Match! Students can now easily discover which clerkships are on VSAS, which sites offer sub-specialty rotations, diversity externship scholarships, and much more.

We continue to work for you! Our board has done an amazing job of leading through policy-based governance and by leveraging the resources of larger organizations such as the AMA to act on issues that affect our membership. This past year, EMRA has adopted policies to:

- Support a broad definition of scholarly activity for residency and fellowship training requirements.
- Oppose changes to the residency application and matching processes that do not include students and residents as stakeholders and which are not supported by evidence.
- State that graduation from an EM residency should be the only credential needed to perform procedural sedation with access to an unrestricted breadth of pharmacological options.
- Support opioid harm reduction efforts through increased access to naloxone, needle exchange programs, and ED-initiated medical assisted therapy.
- Allow the EMRA Medical Student Council Chair to have a vote on the EMRA Board.

We introduced new collaborations with two organizations – FemInEM and AFFIRM. EMRA is fully committed to ensuring a diverse and equitable workforce and is proud to be a sponsor of FemInEM FIX18. EMRA is also excited to partner with AFFIRM, the American Foundation for Firearm Injury Reduction in Medicine, to launch new grants for physicians-in-training to conduct meaningful research addressing issues pertaining to gun violence and firearm-related suicide, homicide, and injury.

EMRA continues to support Emergency Medicine Foundation (EMF) and Emergency Medicine Action Fund (EMAF) each year with an annual contribution of \$25,000. Not only do we provide financial support, but also a resident leader serves on the board of each organization.

It has been exciting and successful year for EMRA! We are pleased to report strong membership, solid financial health and strategic progress in FY 17-18.

Exertional Rhabdomyolysis

IN ATHLETES

Jesse Fodero, MD

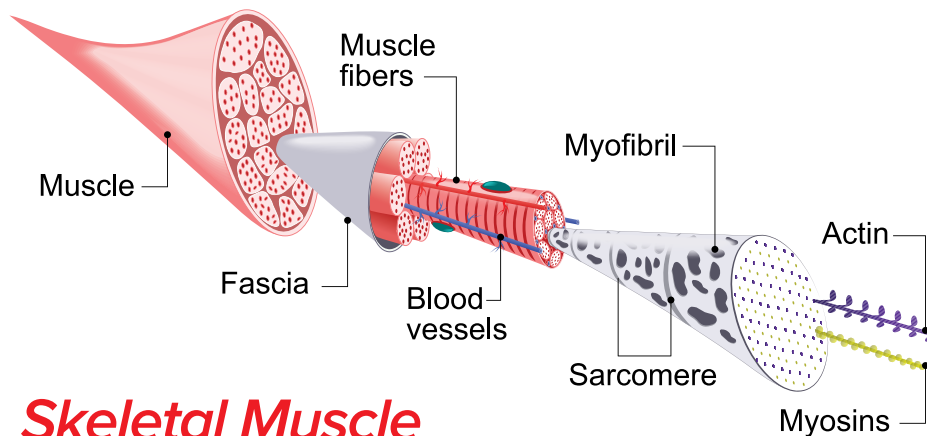
University at Buffalo

John Kiel, DO, MPH

Assistant Professor of Emergency Medicine
Assistant Professor of Sports Medicine
University of Florida-Jacksonville College of
Medicine

It is mid-July and a 20-year-old male presents to your ED with a chief complaint of significant muscle soreness in both thighs. His associated symptoms include malaise and urine appearing darker than usual. He is an athlete on a local college football team and is midway through 2-week training camp practices.

Exertional rhabdomyolysis is a pathologic condition caused by muscle breakdown. It is a rare condition but one that can cause significant morbidity and mortality among athletes. In the United States, there is an annual prevalence of around 12,000 cases per year.¹ Exertional rhabdomyolysis is often seen in military recruits and athletes in whom exertion is continued past the point of fatigue. Athletes most at risk are those performing repetitive eccentric muscle contractions where the muscles are lengthening while simultaneously attempting to contract. This type of muscle contraction is common in exercise programs such as CrossFit and Insanity. Other at-risk activities include American football, athletics, swimming, and various outdoor sports. Individuals participating in endurance activities such as marathon running, use mainly concentric muscle contractions and have a lower incidence of ER.¹ Athletes are more predisposed to ER if they have a baseline of poor conditioning followed by intense training, a sudden increase in their training regimen, or if the training is complicated by high outside temperature or humidity, drug or supplement use, illness, or dehydration.² Overall, ER has a low incidence and low risk of recurrence unless there is an underlying genetic



Skeletal Muscle

disorder such as metabolic myopathies, disorders of calcium homeostasis, or sickle cell disease/trait.¹

Pathophysiology

ER occurs when exercise leads to injury of muscle cell sarcolemma and ion pump dysfunction. This occurs via direct injury or secondary to energy depletion and subsequent dysfunction of ATPase pumps. These pumps are responsible for maintaining low intracellular calcium and sodium levels, with high intracellular potassium. When the pumps are damaged, a high intracellular calcium level develops, leading to activation of calcium dependent enzymes as well as free radical production that then causes destruction of cell membrane proteins. The damaged cell membrane allows for leakage of cell contents including potassium, myoglobin, creatine kinase (CK), and LDH into the bloodstream. It is this release of cell products that can lead to the pain, swelling, and end organ damage of exertional rhabdo. The high intracellular calcium also leads to further muscle contraction in myocytes that are already overactive, contributing to a vicious cycle of further muscle damage.^{1,2,3}

Myoglobin is typically protein bound in the bloodstream, however, when such an abundant amount is present secondary to the leaking myocytes, it begins to

precipitate in the renal tubules leading to obstruction and, if untreated, acute kidney injury. It is this myoglobinuria that leads to the tea-colored urine seen in ER. Other complications include abnormal electrolyte levels, specifically calcium, phosphorus, potassium, and uric acid. These electrolyte abnormalities can lead to cardiac arrhythmias. The released cell contents can also cause disseminated intravascular coagulation (DIC), while associated tissue edema can put the athlete at risk for compartment syndrome. However, despite all of this, ER is associated with a lower complication rate when compared to other causes of rhabdomyolysis. This is likely due to the fact that these athletes often do not have other significant comorbidities.¹

Clinical Features

The clinical presentation of exertional rhabdomyolysis will often involve myalgia and muscle stiffness or weakness with a history that should raise suspicion. These myalgias will usually be significant, not attributable to generalized soreness from the athlete's workout, and is often noted 12-36 hours post-exercise.¹ Typically, postural muscles such as the thighs, calves, and lower back are the most involved. Malaise, fatigue, nausea and vomiting can be seen and less commonly

there may be swelling, tenderness or hemorrhagic discoloration of the skin noted as well.³ Patients may also report discoloration of their urine, often so-called “cola” colored.

Diagnosis

The generally accepted definition of exertional rhabdomyolysis is that the patient must have had muscle-related symptoms that were preceded by exercise, an elevation of CK within 12-36 hours but no more than 4 days post-exercise, along with the presence of myoglobinemia/myoglobinuria. However, myoglobin is rapidly cleared from the blood, meaning that levels may return to normal within 6 hours. This makes serum levels unreliable, and therefore should not be required for diagnosis.^{1,4} Classically, urinalysis will test positive for blood without the presence of RBCs, which is suggestive of myoglobinuria. This occurs due to the fact that urine dipstick does not differentiate between hemoglobin and myoglobin.

Creatine kinase levels will rise within 2-12 hours of injury, peak in 1-3 days and decrease at a constant rate of 39% per day. If decreasing at a slower rate, there should be concern for possible ongoing muscle necrosis or an underlying neuromuscular condition.⁴ The severity of muscle injury correlates with the level of CK elevation, but it is not an accurate predictor of nephrotoxicity. The general consensus is that a CK level greater than 5x the upper limit of normal (ULN) is a conservative value for defining exertional rhabdomyolysis. However, Scalco et al. suggest that if the CK level is less than 50x ULN, the patient is asymptomatic, does not have myoglobinuria or ARF, then the CK elevation is likely secondary to a physiologic response to exercise and not clinically significant exertional rhabdomyolysis.¹

Exertional rhabdomyolysis is considered clinically significant if the symptoms are more than simple myalgia. For example, this would include muscle weakness or swelling. Also, if the patient has an elevated body temperature suggestive of heat stroke, CK level greater than 50x ULN, renal or cardiac comorbidities, has had prior episodes of rhabdo, or myoglobinuria,

there is concern for clinically significant exertional rhabdomyolysis.

Management

If deemed physiologic rhabdomyolysis, it is recommended to have the patient rest for 72 hours, eliminate risk factors, and orally rehydrate. After this rest period, the patient should follow up for repeat CK levels. If the CK level has returned to below 5x ULN, no further studies are needed. If the CK level remains elevated above 5x ULN for more than 2 weeks, expert consultation is recommended.

For patients found to have clinically significant exertional rhabdomyolysis, IV hydration should be initiated as soon as possible. The aim is to produce a urine output of 200-400 cc/hr for the first 24 hours, which may necessitate amounts as high as 1-2L/hr initially. The goal of treatment is to prevent kidney injury. If CK levels continue to rise, if urine output remains low, or if the patient has profound acidosis or hyperkalemia, admission to the ICU for dialysis should be considered. An EKG should be obtained to evaluate for cardiac involvement due to electrolyte abnormalities. If this is a recurrent episode, if there is family history, or if the story does not sufficiently explain the severity (ie, accustomed exercise), one should further investigate genetic causes.

While trending CK levels, if a secondary rise is noted, this should raise concern for occult compartment syndrome.⁴ If deemed clinically significant and further inpatient management is warranted, the risk for acute renal failure (ARF) should be assessed. Risk factors for ARF include a CK level > 40,000 IU/L, age over 50, female sex, and initial creatinine > 1.4.

Other treatment modalities are not typically recommended, as their use has not been shown to have a proven benefit. However, in refractory cases, the use of bicarbonate for significant acidosis or mannitol for inadequate urine output may be considered.^{1,5}

Return to Play

There are no evidence-based guidelines regarding return to play decisions. However, the decision-making process can be simplified by dividing the

population into high and low risk.

If a patient is considered low risk, once their CK level has normalized, there is no myoglobinuria present, no muscle pain, and the patient is otherwise symptom free, light activity may be resumed. After 1 week, if the patient remains asymptomatic, normal athletic activity can be resumed gradually.

However, if the patient is thought to be high risk, return to play should be delayed. High risk patients are considered to be those who had a course complicated by ARF, a recovery period longer than 1 week despite appropriate rest, or an elevated CK level beyond 2 weeks post-injury.

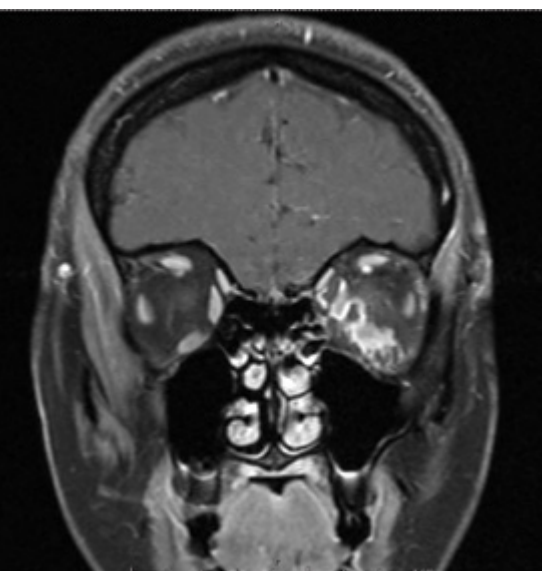
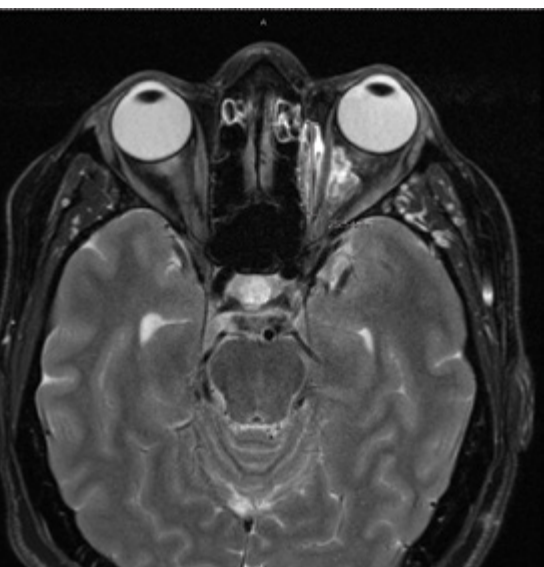
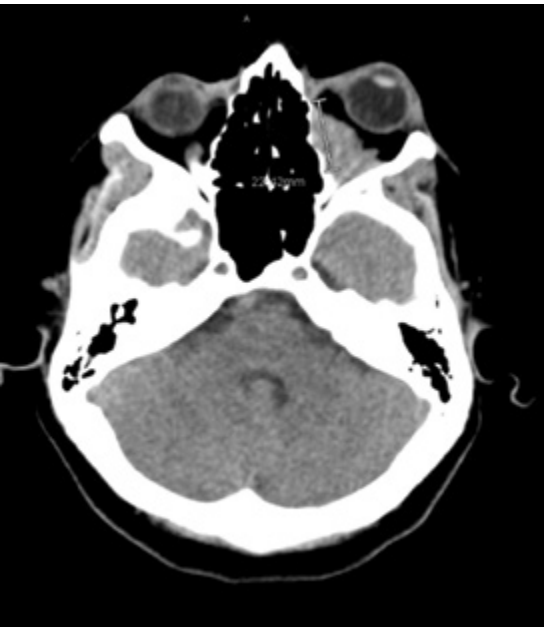
Athletes with sickle cell trait, a family history of exertional rhabdo, or malignant hyperthermia are also considered to be high risk. These athletes should be closely monitored by the team physician, along with further follow up to assess for an underlying genetic disorder.^{1,2,4}

Conclusion

Exertional rhabdomyolysis is a rare but potentially fatal condition that should be considered in any athlete with significant post-exercise myalgias. Uncomplicated cases can be managed with rest, oral rehydration, and outpatient follow-up. However, in more severe cases, admission for IV hydration and monitoring is necessary. Return to play should be based on the individual athlete, but once symptoms and labs have returned to baseline, gradual return to normal activity is acceptable. If the patient is considered high risk or if return to play results in return of symptoms, further work-up is warranted.

Case Resolution

The patient was found to have an elevated serum CK level, myoglobinuria on urinalysis, and a slightly elevated creatinine. He was admitted for IV hydration, after which the serum CK and creatinine trended down appropriately. As he was deemed low risk, he began a graduated return to play under the supervision of his team physician and athletic trainer. No symptoms recurred and he was therefore cleared to return to full activity. He was cautioned to avoid such intense, unaccustomed exercise in the future. ★



Spontaneous Proptosis in the ED

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Introduction

The eye is a critical organ in our everyday life. We use the eye to help us navigate the world, communicate with others, and protect us from danger. From 2005 to 2011, an estimated 11.9 million emergency department visits were for eye complaints (emergent and non-emergent).¹ Urgent identification of vision threatening causes of eye emergencies is critical to saving a person's vision. Eye emergencies can be due to traumatic or non-traumatic etiologies such as chemical burns, acute angle glaucoma, vascular compromise such as retinal artery/vein occlusion, or orbital compartment syndrome (OCS). Orbital varices, though rare, can cause orbital compartment syndrome leading to a vision-threatening emergency. It is important for an emergency physician to be able to recognize the signs and symptoms of orbital compartment syndrome and treat it urgently.

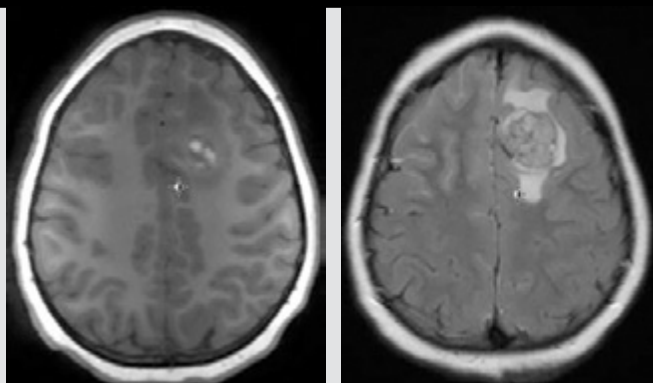
Case Presentation

A 39-year-old healthy woman presented to the emergency department with left eye swelling and pain worsening over 24 hours, vertical diplopia, headache, and vomiting. Physical examination was significant for right eye visual acuity of 20/25; left 20/30. Pupils were equal, round and reactive bilaterally with no afferent pupillary defect. Right intraocular pressure was 12 mmHg; left 11 mmHg. Externally, there was 5 mm of relative proptosis and 4 mm of hyperglobus on the left. Full extraocular motility was intact bilaterally but painful with movements on the left. The patient had a remote history 18 years ago of her left eye bulging due to a "leaky blood vessel" but otherwise had no

significant past medical history. Computed tomography (CT) imaging was obtained, and ophthalmology was consulted. The patient was admitted for pain control, antiemetics, and systemic steroid therapy to reduce the associated edema. MRI was also obtained, demonstrating a heterogeneous, poorly circumscribed mass with variable areas of enhancement consistent with an orbital varix with acute hemorrhage. The patient did well and was discharged after 24 hours on long-term oral steroids without surgical intervention.

Discussion

Orbital varices represent less than 1.3% of orbital tumors.² Malformations typically comprise single or multiple venous channels. Primary varices are congenital; secondary varices are arteriovenous malformations, carotid-cavernous fistulas, or dural arteriovenous fistulas that drain into the orbit.^{2,3} Orbital varices can cause ocular hemorrhage, thrombosis and optic nerve compression, causing pain, proptosis and visual changes.⁴ Diagnosis is by CT, MRI or ultrasound. Importantly, acute hemorrhage can result in sudden, increased intraorbital pressure resulting in OCS. Orbital signs concerning for OCS include marked decreased visual acuity, afferent pupillary defect, proptosis, diffuse subconjunctival hemorrhage, chemosis, and pain with eye movement. If signs of OCS are present, lateral canthotomy and inferior cantholysis are indicated to decompress the eye and preserve the patient's vision.⁵ Other key steps to managing these patients while in the emergency department include head-of-bed elevation of at least 45 degrees, pain control, antiemetic therapy, cough suppressants, antihypertensives, correction of any coagulopathy and reversal of anticoagulants if benefits outweigh risks. Some patients may require surgical intervention if they have nonresolving thrombotic episodes, disfiguring proptosis, or optic nerve compression. ★



MRI brain (Image 1a and 1b) showing nodular area with hyperintense (T1 signal) in the left frontal lobe with surrounding edema consistent with metastatic lesion and significant diffuse leptomeningeal enhancement.

Melanocytes That Can Kill

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A 7-year-old Caucasian male presented to the pediatric ED with a chief complaint of persistent frontal headache for 1 week. He had no history of prior headaches with vomiting or migraines. His parents reported increasing sleepiness, fatigue and weakness over the past week. Associated symptoms included body aches, intermittent non-bloody/non-bilious emesis, and decreased oral intake. The parents reported no fevers, upper respiratory infectious symptoms, vision problems, focal weakness, gait instability, or recent travel, trauma, or sick contacts. Parents said he was diagnosed with giant congenital melanocytic nevi at birth and had an MRI of his brain at 2 months of age showing neurocutaneous melanosis (NCM) but was lost to follow-up at 6 months of age. He was seen at an outside facility 2 days prior and had unremarkable lab work and a negative head CT scan. Vital signs showed that he was bradycardic with a heart rate of 30-60/min and hypertensive with BPs ranging between 120s-130s/80-90s mmHg. He was afebrile and had normal respirations. He was awake, alert, and oriented x 3 but appeared uncomfortable. Neurologic examination

revealed left lower extremity clonus with no other focal or cranial nerve deficits. Fundoscopic examination showed no papilledema. He had a large nevus covering most of his back and neck, as well as several smaller hyperpigmented patches on the extremities.

CBC, BMP, and urine and serum drug screens were unremarkable, except for mild hyponatremia. EKG showed sinus bradycardia, and chest X-ray was negative. Cardiology was consulted and he was admitted to the PICU with concern for elevated intracranial pressure, as hypertension and bradycardia suggested Cushing's reflex. Emergent MRI scans of the brain and spine were obtained, revealing multiple linear and nodular lesions with extensive leptomeningeal enhancement with diffuse craniospinal melanomatosis suggestive of NCM. He underwent debulking surgery to alleviate spinal cord compression. Pathological evaluation confirmed malignant transformation.

Two months later, he developed paraplegia and was started on chemotherapy for residual malignancy. He was found to have multiple CNS recurrences and, despite aggressive therapy, died 6 months later.



MRI spine (Image 2a and 2b) showing diffuse intradural enhancement, nodular lesions at T2-T3, and abnormal signal at multiple levels suggestive of craniospinal melanomatosis with neurocutaneous melanosis.

Discussion

Congenital Melanocytic Nevi (CMN) are nevi (moles) that are either present at birth or arise within the first few weeks of life. They vary in size from small to very large (>20 cm) or even giant (>50cm). The major medical concern with giant CMN is the high risk of developing cutaneous or leptomeningeal melanoma and/or neurocutaneous melanosis (NCM). Giant lesions are commonly found along the back and trunk, usually sparing the head and extremities, resulting in its classical descriptive terms: bathing trunk nevus, cape nevus, and garment nevus. Neurocutaneous melanosis (NCM) is a rare, non-inherited condition characterized by melanocytic nevi affecting both the skin and brain. Patients with large CMN on the posterior axis or multiple lesions are at increased risk for developing NCM. NCM usually presents within the first 5 years of life, but may present at 7-10 years of age. Intracranial hypertension manifests as seizures, decreased mentation and cranial nerve dysfunction. Symptomatic NCM carries a poor prognosis — median survival is 6 months and median age of death is 5 years.

Children with risk factors for NCM should be screened regularly using MRI. ★

Fluid Responsiveness in a Hemodynamically Unstable Patient

Will My Critically Ill Patient Respond to This Bolus?

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Only half of patients who are hemodynamically unstable will respond to a fluid bolus.¹ There are no historical or physical examination findings that can help us decide whether a patient is a fluid responder, but we must treat hypotension, as we do know that a mean arterial pressure (MAP) less than 60 mmHg increases the risk of death and acute kidney injury (AKI).^{2,3}

Empirical fluid administration is the mainstay of treatment for the hemodynamically unstable patient, but continued fluid resuscitation of the fluid non-responder, or even the fluid responder, can be detrimental. The CLOVERS trial (Crystalloid Liberal or Vasopressors Early Resuscitation in Sepsis), is comparing the restrictive use of fluids and early vasopressors to liberal fluids and rescue vasopressors. This study is expected to be complete in 2021. Given the potential harm from fluid therapy, determining if a patient is on the slope of their Frank-Starling curve will enable to you be far more accurate in determining if your patient is of the 50% who will respond to a fluid bolus.

There are several measures to predict fluid responsiveness. Static measures such as central venous pressure and pulmonary artery occlusion pressure have not been shown to predict fluid responsiveness. Ultrasound measurement of the inferior vena cava (IVC) diameter has not been shown to predict fluid responsiveness. IVC collapsibility index (IVCCI) has conflicting evidence in spontaneously breathing patients, but may be modestly useful if an IVC is very collapsible (>40%), or very distended (<15% collapsible).⁴⁻⁶ IVCCI performed

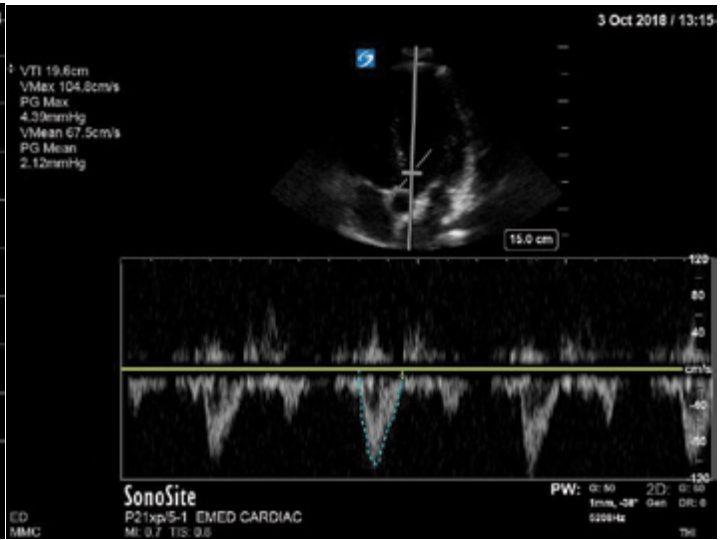
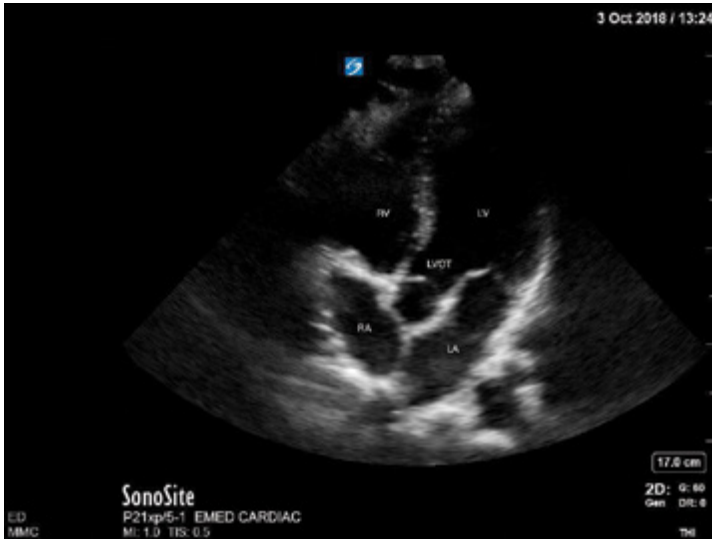
better in mechanically ventilated patients,⁷⁻⁹ but similar to the studies in spontaneously breathing patients, they are limited by heterogeneity, small study populations, no standard probe axis, and no standard measurement location.

Dynamic measures of fluid responsiveness perform better than static measures. These include pulse pressure variation (PPV), stroke volume variation (SVV), pulse contour analysis, and bioreactance. These methods take advantage of measuring pulse pressure or stroke volume and their variation during the respiratory cycle, where increases and decreases in venous return produce subtle changes in cardiac output. While these methods of predicting fluid responsiveness have been shown to perform well, they require invasive blood pressure monitoring as well as proprietary devices (e.g. PiCCO, FloTrac™, NICOM™) which are not readily available in most emergency departments.¹⁰

Echocardiography is a practical way for emergency physicians to determine if fluid therapy will increase cardiac output. Echocardiography can predict fluid responsiveness by measuring stroke distance, also known as the velocity time integral (VTI), before and after a passive leg raise (PLR). VTI is a measure of the distance blood travels during a cardiac cycle, and serves as a surrogate for stroke volume.¹¹ VTI can be measured in patients who are mechanically ventilated, spontaneously breathing, and with dysrhythmia. Increases in VTI induced by a PLR indicate a patient is fluid responsive.

Emergency physicians can accurately measure VTI.¹² Dr. Avila at *5 Minute Sono* demonstrates how to perform this technique at the bedside.¹³ The technique and its limitations are also described by Marsia Vermeulen in the November 2017 edition of *EM Resident*.¹⁴ From the apical four chamber view, an apical five chamber view can be obtained by angling





the probe anteriorly. The pulsed-wave doppler gate is then placed over the aortic outflow tract and a biphasic waveform is generated. On many ultrasound machines, the VTI is auto-calculated after the waveform is traced. The VTI is measured before and 1-2 minutes after PLR.

Preload is augmented by PLR. If VTI increases after PLR, one can infer that the patient's stroke volume, and

therefore cardiac output and MAP, will increase with a fluid bolus. If VTI does not increase, the patient may be better served with vasopressors or inotropes. One study demonstrated that an increase in VTI by 12.5% was 77% sensitive and 100% specific for response to a 500mL fluid bolus.¹⁵ Another study demonstrated that an increase in VTI of 10% after PLR was 97% sensitive and 94% specific for fluid responsiveness.¹⁶

Fluid administration is an integral part of resuscitation in the critically ill patient; however, only 50% of unstable patients will respond to a fluid bolus. Both under-resuscitation and hypervolemia are harmful to patients. VTI is the most accurate bedside tool to guide the resuscitation of your critically ill patients and predict if they will respond to a fluid bolus. ★



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The Lupus of Metabolic Disorders

Pediatric Hypoglycemia and Its Management

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Case 1. A 15-day-old male born full term with no prior hospitalizations or medical history is transferred to your pediatric emergency department from a small rural emergency department with the chief complaint of “lethargic since this morning.” At the transferring facility the infant was responsive only to painful stimuli, was hypothermic, and had a partial sepsis workup done (everything except the LP); he received a 20 cc/kg bolus while awaiting EMS transport.

Case 2. A 2.5-day-old female born at the other hospital in town, full term with no complications, but who has not been latching well, arrives to

your emergency department “looking blue” and is rushed back to a bed.

While nurses are rushing to get vitals, you put the patient on a monitor and attempt to get a weight, if time allows. The neonate appears a little irritable but is consolable with mom. Vitals demonstrate an afebrile, tachycardic, and tachypneic baby. Your primary survey demonstrates the same, no murmurs, but you appreciate peripheral cyanosis with some perioral cyanosis. You ask to start a line, get labs, culture, UA and urine culture, place the patient on oxygen, and go to grab the ultrasound to do a bedside ECHO.

Case 3. A 4-year-old girl with no medical or surgical history arrives at your ED with mother who brought her in because she has been acting “funny” at home. On arrival you find a healthy-appearing girl sleeping in her mother’s arms. When you attempt to wake her she wakes up to voice. Your primary survey was unimpressive. You ask the nurse to get vitals while you go to the computer to input orders. On your way over you hear the mother yelling, “She’s having a

seizure, help!” You quickly hurry back to the room and observe the girl having a generalized tonic-clonic seizure.

Background

Hypoglycemia in pediatric patients can be described as the lupus or syphilis of metabolic disorders. It can be hard to differentiate if the hypoglycemia is the cause of the symptoms or is a result of some underlying disorder like hyperinsulinism, glycogen storage disorders, fatty acid disorders, hormonal deficiencies and metabolic defects, or if it is a result of sepsis, cardiac and CNS abnormalities.

Hypoglycemia can be divided into asymptomatic and symptomatic. Asymptomatic hypoglycemia is defined at a preset plasma glucose (PG) level without any associated signs or symptoms of hypoglycemia. Symptomatic hypoglycemia is defined at a preset PG level with associated signs and symptoms of hypoglycemia. The cutoff PG value to define pediatric hypoglycemia varies based on hospital protocol and even among researchers. This debate is

TABLE 1. Definitions of Age and Plasma Glucose Concentration Cut-offs

Age and Plasma Glucose Concentration Cut-offs	
Preterm Neonate: 0-72 hrs old	Hypoglycemia: <50 mg/dL
Full Term Neonate: 0-72 hrs old	Hypoglycemia: < 40 mg/dL
Full Term Infant: > 72 hrs old	Hypoglycemia: < 60 mg/dL
Pediatric: > 2 years old or can communicate efficiently	Hypoglycemia: < 60 mg/dL
Pediatric patients with underlying diabetes	Relative Hypoglycemia: > 70 mg/dL

especially pertinent in the neonatal age group because neonates can have normally low glucose levels as low as 35 mg/dL and remain asymptomatic or as high as 45 mg/dL and present with symptoms of hypoglycemia. Furthermore, there is a debate as to the age cutoff that differentiates a neonate versus an infant. See **Table 1** for the most common PG value cutoffs that, even when a patient is asymptomatic, should be treated as well as the most commonly used age cutoffs for neonates and infants. Diabetic patients, as they are used to higher levels of PG, can become symptomatic at higher PG levels. Making a strict definition that applies to all pediatric patients is difficult; therefore, we used what we understood to be widely accepted cutoffs.

The major energy source for the fetus, neonate, and pediatric patient is glucose. The pediatric patient's brain, especially in neonates and infants, utilizes up to 90% of the total body glucose. Additionally, pediatric patients have a higher rate

of glucose turnover per kg because the brain-to-body ratio is much higher than in adult patients. These characteristics combine to give pediatric patients an inherently higher risk of hypoglycemia. At birth there is an interruption of the constant glucose supply from the placenta, leaving the neonate to utilize their own body stores of glucose via breakdown of glycogen, free fatty acids, and protein. Neonatal glycogen stores are quickly depleted, and gluconeogenesis begins within hours of birth. At about 4-8 hours after birth, most neonates are at a steady state of PG levels, but will soon require an external source of glucose due to the real risk of hypoglycemia, which when prolonged can have long-term neurologic sequelae.

Signs and Symptoms

In adults or verbal children there can be more obvious signs of hypoglycemia like hunger or irritability. However, neonates, infants, and young pediatric

patients are not able to verbalize their symptoms; therefore, the trained clinician must be aware of the subtle signs and symptoms. Hypoglycemia symptoms can be mistaken for toxidromes, postictal state, sepsis, meningitis, congenital cardiac abnormality, and many other diagnoses (see **Table 2**).



PEARL. When otherwise healthy patients present confused, with seizure-like activity, altered, and appear to have a toxidrome, always check their blood sugar!

Work Up

For the infant or child with hypoglycemia not easily explained by history (eg, a diabetic child who received insulin but failed to eat, or a clear-cut oral hypoglycemic ingestion), the emergency medicine physician plays a vital diagnostic role. Historical facts to hone in on in all patients include symptom onset and progression, relationship with food/feeding. For neonates and young infants, birth weight and history should also be considered. Family history of any metabolic or genetic disorders should be elicited. Physical exams should include any evidence of dysmorphic features, metabolic abnormalities and toxidrome findings. For example, patients with hypothyroidism may have poor muscle tone, macroglossia, large fontanelles, and hoarse crying,

TABLE 2. Signs and Symptoms of Hypoglycemia

	Constitutional	HEENT	CV	Lung	GI	Neuro
Neonates & Infants (≤ 23mos)	Hypothermia Pallor Irritability Lethargy		Tachycardia	Tachypnea Cyanosis Apnea	Poor Feeding Increase in feeding or signs of hunger Hepatomegaly (due to glycogen storage diseases)	Hypertonia Seizure Coma
Pediatric (≥ 24 mo)	Anxiety Pallor Diaphoresis Irritability Lethargy	Visual Disturbance	Tachycardia Palpitations		Hunger Nausea	Headache Paresthesias Weakness Tremor Confusion Bizarre Behavior Incoordination Coma

Referenced from Thornton, 2015

while patients with hypopituitarism can have cleft palate, small for age/short stature and/or micropenis. Patients with adrenal insufficiency can present with hyperpigmentation, anorexia, and weight loss. Glycogen storage disorders in patients may be hinted at with exam findings of hepatosplenomegaly.

Basic labs including urine analysis, CBC, BMP should be drawn, but if you get a POC glucose that is low, you should treat the hypoglycemia without waiting for a laboratory glucose. A plasma glucose is also important due to the small, but sometimes significant discrepancy in values between the lab glucose and the POC glucose. To identify the primary cause of the hypoglycemia, additional labs should be considered to evaluate for sepsis, and metabolic disorders. This could include plasma insulin levels if there is a suspected hyperinsulinemia or insulin overdose, as well as free fatty acids and C-peptide levels. High plasma insulin levels with a low C-peptide level can indicate exogenous insulin exposure as endogenous insulin is attached to C-peptide prior to activation and would have similar C-peptide levels. Even if you haven't identified a specific set of tests that would help you with diagnosis in the ED, it may be beneficial to the admitting team to have samples of urine and blood at the time of presentation and prior to administration of glucose to aid in diagnosis (Table 3).

Generally, imaging is not required in the ED once your suspicion for hypoglycemia is confirmed with a low PG. The exception to this rule is if you are considering a traumatic or neoplastic cause to the altered mental status or seizure that the patient may be experiencing.

Treatment

Asymptomatic Patients

Once hypoglycemia is confirmed via a low POC or plasma glucose level, treatment should be initiated regardless of patient symptoms. If the patient is fully conscious and is able to drink and/or eat without risk of aspiration then a simple sugar either via glucose tablet/gel, sugar, juice or similar should be given and a glucose rechecked in 10-

TABLE 3. Diagnostic Testing

Blood	Urine
Plasma Glucose	UA (Ketones)
Electrolytes (Anion Gap)	Reducing Substances
Lactate	Organic Urine Acids
Beta-hydroxybutyrate	
Acetoacetate	
C-peptide	
Ammonia	
Insulin	
Glucagon	

20 minutes. Another attempt at oral glucose supplementation can be made or parenteral glucose should be considered if recheck continues to demonstrate hypoglycemia.

Symptomatic Patients

Similar to asymptomatic patients, the oral route is preferred for hypoglycemia treatment if the patient is conscious and can tolerate oral glucose administration. However, patients with the inability to protect their airway due to altered mental status, severe lethargy, or active seizures must receive immediate parenteral replacement with IV dextrose and/or IV/IM glucagon (see Table 4). A bolus should be administered initially with frequent rechecks of glucose level. If the patient continues to be hypoglycemic in the setting of multiple boluses, the next step would be a continuous infusion of dextrose containing fluids. After starting an infusion of dextrose, PG levels should be monitored every 30-60 minutes or per your hospital nursing protocol. Goal blood glucose is a concentration above 40 mg/dL, 50 mg/dL, or 60 mg/dL in neonates, infants and pediatrics, respectively. Sulfonylurea ingestions are a special case of hypoglycemia and these patients should also be considered for administration of octreotide. Excessive insulin administration can be treated with glucagon in addition to IV boluses of dextrose.

Table 4. Do not use D25 or D50 or large volume boluses as they can create rebound hypoglycemia in hyperinsulinemic patients and can cause dangerous shifts in plasma osmolality. Furthermore, in high concentrations, particularly in neonates it may cause venous sclerosis and local tissue damage,

partially due to the small diameter of neonate and infant veins. D10 is 10g of glucose in 100ml water, D25 is 25g of glucose in 100ml water and so on. (Referenced from Lexicom and Thornton)

Disposition

In general, if a patient appears to present as a pure hypoglycemic episode based on history, physical exam and diagnostic testing (if deemed necessary) short term observation for 1-2 hours, oral glucose replacement and glucose checking should be done and the patient can be safely discharged. However, if there is thought that the cause of hypoglycemia is due to ingestion, infection, metabolic abnormality, etc then one must be vigilant and admit the patient for observation even if history, physical exam and labs are not diagnostic for any serious pathology in the ED.

CASE 1 CONTINUED

The 15-day-old infant arrives to the ED via EMS, who state the patient was tachycardic, tachypneic, hypothermic at 95 F. The transferring facility only had a CBC by the time EMS arrived. As the patient is being placed on a monitor, you evaluate the ABCs and request a POC glucose. Patient is hemodynamically stable, but “punk” appearing on the primary survey. The nurse reports that the glucose is 38. Using the patient’s weight, you request a 2 mL/kg bolus of D25W in addition to a rainbow blood draw for cultures and other “zebra” testing, urinalysis, urine culture and glucose recheck in 10 minutes. After administration of the glucose, infant appears more awake and interactive. Tachycardia and tachypnea are improved, and the repeat glucose is 57. Mom states

she has had trouble with her son eating well on the breast and that he would go hours without a good feed. You ask the nurse to bolus another 2 mL/kg of D25W. After the second bolus the patient appears very well, is interactive and attempting to eat, with vital signs stabilized to normal. The recheck glucose is 84 and you tell mom she can feed the infant. After observation the infant's glucose stabilizes on several rechecks, all labs come back as normal, and the infant looks terrific. However, you still perform an LP, start IV antibiotics, and admit the patient to rule out sepsis, inborn error of metabolism, etc. You find out the patient is discharged in the next 48 hours as the blood cultures came back normal and no other lab values were abnormal. The mother was educated to supplement formula and to not allow more than 2 hours to go by between meals with close PCP follow-up the next day.

CASE 2 CONTINUED

Bedside ultrasound appears abnormal with an overriding aorta and possible VSD. The technician, who decided to check a POC glucose tells you that the glucose is 34, which prompts you to have the nurse bolus 2 mL/kg of D10W. Soon after the bolus the baby appears to perk up but continues to be cyanotic. Repeat POC glucose is 45. While waiting for labs to return you bolus the neonate with 10/cc/kg of 1/2 NS with D10 as well as IV antibiotics, 20 cc/kg NS, and then call

PICU and cardiology. You admit the patient for continued work-up with a broad differential including congenital heart disease, sepsis, and inborn errors of metabolism.

CASE 3 CONTINUED

The seizure is short lasting and per the mom the girl has no history of seizures. You ask the nurse to check a glucose, which you find to be 32, so you have the nurse attempt to get IV access to allow you to bolus the patient with 1 mL/kg of D50W. The nurse is unsuccessful at the first IV attempt, so while getting the other IV you have another nurse give a 0.3 mg/kg IM shot of glucagon, while you get the IO kit ready if the nurse is unsuccessful on her second attempt. The nurse gets the IV and you ask her to draw a rainbow of labs and to bolus with D50W. On reassessment the patient appears lethargic now and is only responding to painful stimuli. You recheck the glucose and it is 34. Nothing on the history you got from mom was concerning besides the acute onset of symptoms today after mom picked the patient up from grandma's house. You have mom call grandma and find out that some of her "sugar pills" are missing, but she doesn't know which one as it's missing from her weekly pill box; she "thinks the medicine starts with a 'G'." Sulfonylureas are on your differential, so you also give a bolus of octreotide and place the patient on an infusion of glucose and admit to PICU. ★



Pearls for Evaluation, Treatment and Disposition of Hypoglycemic Pediatric Patients

- Work Up
 - Get a POC and plasma Glucose
 - Consider CBC, CMP, lactate, ammonia, UA if not simple hypoglycemia
 - Zebra labs should be drawn in conversation with Pediatric team, also think of obtaining a critical sample of labs and urine prior to treatment
- Oral Glucose
 - Asymptomatic
 - Tolerate PO
- Symptomatic
 - 1st line is Parenteral Bolus
- Dextrose Rule of 50
 - D10/D25/D50 @ rates of 5/2/1 mL/kg IV
- Disposition
 - Monitor glucose levels 1-2 hrs or until patient is alert and can tolerate PO, then can discharge home with close PCP follow-up/good return precautions
 - If not, then admission recommended
 - Neonates and Infants recommend admission for monitoring

TABLE 4. Treatment of Hypoglycemia

		Neonate (< 72 hrs old)	Infant (>72 hrs old – 23 mos)	Pediatric (≥ 24 mos)
Asymptomatic and/or able to Tolerate PO	Oral (1st line)	Breast Milk/Formula Feed 5 ml/kg D5W Dextrose Gel 40% 0.5ml/kg (0.2/kg/dose Massage into Buccal Mucosa)*	Breast Milk Formula Juice	Juice Food
Symptomatic and/or unable to tolerate PO	Bolus (1st line)	Min: 2 mL/kg/dose D10W Max 5-10 mL/kg/dose D10W	2-4 mL/kg/dose D25W	1-2 mL/kg/dose D50W
	Infusion	Min: 0.05-0.08 mL/kg/min Max: 0.12-0.14 mL/kg/min	—	—
	Glucagon Bolus	0.3 mg/kg SC/IM/IV**	0.3 mg/kg SC/IM/IV**	1 mg/kg SC/IM/IV

*Can repeat up to 6 doses over 48 hrs

**Max dose 1mg/kg

THE DYSFUNCTIONAL DRUMMER

Sick Sinus Syndrome

Ashley Mogul, MD

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A 78-year-old female with history only of leg edema presents to the ED complaining of nausea and dizziness for the past few hours. EMS reports that upon their arrival she was found to be in atrial fibrillation and subsequently passed out, at which time she was noted to have an asystolic episode of about 4.5 seconds, which self-resolved. Upon arrival to the ED she is noted to be in atrial fibrillation at a rate of 110-120 with a blood pressure of 101/60, complaining of pain of chest and abdomen and dry heaving. Moments later her heart rate decreases significantly, rhythm noted to be a complete heart block followed by asystole (Figure 1); she is unresponsive at this time. Seconds later she is again awake and alert, now sinus rhythm in 80s. The decision is made to place an emergent transvenous pacemaker.

Sick sinus syndrome (SSS) is a collection of disorders in which the heart does not successfully perform its pacemaking function.¹ This syndrome is diagnosed based on electrocardiographic

findings of arrhythmia, such as bradyarrhythmia or sinus pause. It is often associated with clinical signs and symptoms including fatigue, lightheadedness, presyncope, syncope, dyspnea on exertion, chest discomfort, or palpitations.² It is a fairly common condition, particularly in elderly patients with concomitant cardiac disease, and prevalence is high in patients who have an increased BMI or a history of hypertension, diabetes, coronary artery disease, or heart failure. About half of patients with SSS will have a tachycardia-bradycardia syndrome in which they have a rapid heart rate, often atrial fibrillation or atrial flutter, followed by bradyarrhythmia.³ The incidence of SSS increases with age and affects males and females similarly. With an increase in our geriatric population, the prevalence of SSS in the United States is expected to double in the next 50 years.⁴

Sinus node dysfunction may be related to atrial remodeling secondary to aging, heart failure, or atrial fibrillation, or it may be genetic and secondary to ion channel dysfunction. Infiltrative processes or ischemia stemming from coronary artery disease can also affect the function of the sinus node.³ Medications

that affect the atrioventricular node such as beta blockers, calcium channel blockers, digoxin, antiarrhythmics, and acetylcholine esterase inhibitors should be considered as reversible causes of sick sinus syndrome,² as should electrolyte abnormalities, hypothyroidism, hyperthyroidism, hypoxia, hypothermia, and toxins.¹

After ruling out secondary causes including cessation of nonessential medications and monitoring for clearance through 3-5 half lives,⁵ SSS in patients with clinical symptoms should be treated by placement of a permanent pacemaker.³ In the acute setting, any unstable patient presenting with findings consistent with SSS should be treated by standard ACLS, considering atropine but not delaying initiation of pacing. Transcutaneous pacing is a temporizing measure while arranging to place a transvenous pacemaker. Those who are stable should be monitored with transcutaneous pads in place while arranging definitive care.⁵

Approximately 30-50% of the pacemakers placed in the United States are for the treatment of SSS.³ Pacemakers have not been shown to reduce mortality in SSS but are associated with decreased symptoms and improved quality of life.¹ A prospective multicenter study that examined the 12 months before and after pacemaker placement in 87 patients found a significant decrease in symptoms including syncope and dizziness after pacemaker placement as well as a significant decrease in number of falls.⁶ There is a high incidence of atrial fibrillation in patients with SSS requiring pacemaker, so thrombotic risk must be considered and anticoagulation initiated as indicated.^{3,5}

Case Conclusion

A transvenous pacemaker was successfully placed and the patient was admitted to the cardiac intensive care unit. She was noted on echocardiogram to have a severely dilated left atria with mild diastolic dysfunction (Figure 2). A permanent pacemaker was placed, and she was discharged on apixaban. ★

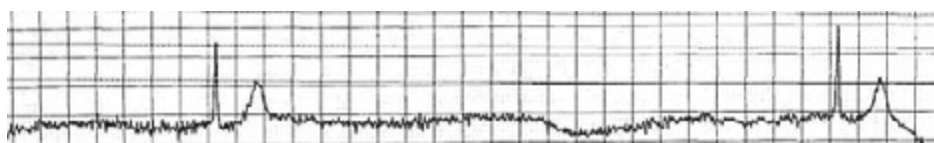


FIGURE 1 (above).
Pause of about
4.5 seconds

FIGURE 2 (at right).
Severely dilated
left atria seen on
parasternal long
axis view



Thyrotoxicosis

STEMI Plus Acute Psychosis

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A 37-year-old female presents to a community ED intensely concerned about left shoulder pain of 2 months duration. She complains of weakness, fatigue, palpitations, dyspnea on exertion, and lower extremity edema occurring inconsistently for the past 6 months. She appears restless with pressured speech, but otherwise looks her stated age.

On physical examination she is tachycardic with a heart rate of 161, febrile to 101.8F, and tachypneic with 26 respirations per minute. Her blood pressure is mildly elevated at 152/93, and she is saturating at 100 percent on room air. Generally, she appears agitated and thin. She is very anxious and is concerned that she cannot stay in the hospital much longer because of her PTSD. A large, firm thyroid large firm thyroid is noted. She is tachycardic with a regular rhythm, and her abdomen is soft. On the patient's lower extremities you note mild pretibial edema.

This presentation is odd, but anxiety, tachycardia, age, and enlarged thyroid gland mean thyroid storm is on the differential diagnosis. Basic elements in the evaluation of this patient include: EKG, TSH, free T4, CBC, CMP, and glucose. The results of these tests demonstrate a low TSH, elevated T4, and EKG demonstrating ST elevation in leads II, III, and aVF with reciprocal lateral lead depression. Elevated thyroid hormone levels, decreased TSH, fever, agitation, and acute cardiac pathology further support concern for thyroid storm.

What Is Thyroid Storm?

A thyroid storm is an acute, life threatening emergency characterized by a hypermetabolic state precipitated by the presence of excessive thyroid hormone. If untreated, mortality rates in patients

with a thyroid storm are between 80% and 100%, and with timely management mortality is still estimated between 15% and 50%.¹

The basic pathophysiology operating as the driving force behind a thyroid storm is a hyperadrenergic state occurring as a result of primary hyperthyroidism leading to increased T₃ and T₄ release from the thyroid, or secondary hyperthyroidism directed by excessive TRH leading to elevated levels of TSH.

A plethora of underlying diseases can degenerate into a thyroid storm, but Graves' disease is by far the most common, accounting for approximately 85% of cases in the U.S.¹ Often, this presentation arises in an individual with baseline hyperthyroidism exacerbated by infection, MI, pregnancy, trauma, or other stressors.

Recognition and Initial Management

Recognizing an acute thyroid storm is critically important. Severe presenting symptoms include hyperpyrexia, tachycardia, CHF, dysrhythmia, agitation, anxiety, delirium, liver dysfunction, and psychosis.

Diagnosis of thyroid storm hinges on the presence of the aforementioned severe, life-threatening symptoms paired with laboratory evidence of hyperthyroidism. Elderly patients must be diagnosed with caution, as they can present with an apathetic thyroid storm where fever and hyperactivity are absent.¹ The Burch-Wartofsky Point Scale is a useful tool for identifying a thyroid storm. Patients score points for dysfunction in thermoregulation, the gastrointestinal system, or the hepatic system as well as tachycardia, atrial fibrillation, evidence of heart failure, and changes in neurologic status. Patients presenting with thyroid storm and associated neuropsychiatric symptoms

should be managed carefully because they are at an increased risk for mortality.²

Management of a thyroid storm focuses on 5 critical components in a stepwise approach: 1) Supportive care; 2) Beta-blockade; 3) Inhibiting the new synthesis of thyroid hormone; 4) Preventing the release of new thyroid hormone; and 5) Stopping peripheral conversion.

Supportive care is key; control fever with antipyretics and cooling. Benzodiazepines can be considered for anxiolysis, along with crystalloid fluids for rehydration.

Next, administer beta-blockers to mitigate the peripheral effects of elevated thyroid hormone. This is commonly accomplished with propranolol, which also alleviates agitation and tremor; be sure the patient does not have underlying heart failure or pulmonary disease.

Thalidomides such as propylthiouracil and methimazole inhibit new synthesis of thyroid hormone. Meanwhile iodine can be administered to block the release of pre-stored hormone.

Finally, hydrocortisone or dexamethasone can prevent peripheral conversion of thyroid hormone.

Case Management

Additionally, in patients with thyroid storm, neuropsychiatric symptoms portend a high risk presentation. In this case the patient's psychiatric symptoms are concerning. If a desire to leave against medical advice is expressed this should be approached cautiously. The question of whether the patient has decision-making capacity should be raised early following diagnosis of thyroid storm, and their ability to understand the risks of signing out from the hospital against medical advice should be carefully considered. ★

POSTPARTUM PREECLAMPSIA

A Rare Complication

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Postpartum preeclampsia can result in severe long-term complications for a new mother. It is one of the most feared postpartum medical complications emergency physicians will encounter. Even more uncommon is the progression from seizures to intracranial hemorrhage. Early recognition of late onset eclampsia, defined as onset of seizures greater than 48 hours postpartum, is crucial in minimizing adverse outcomes. We present a case of a postpartum woman who developed late onset postpartum preeclampsia as well as subsequent intracerebral hemorrhage.

Case

A 24-year-old female, G1P1, 6 days postpartum presented to the emergency department with a chief complaint of

headache for one day, unrelieved by over-the-counter acetaminophen. Initial blood pressure (BP) was 155/86 mm Hg. CT Head and CTA performed to rule out subarachnoid hemorrhage were normal. Patient was initially given Toradol IV, fluids, Compazine, and Sumatriptan with no improvement noted. On reassessment, BP was 206/97 mm Hg. Patient was started on Hydralazine IV, and labs were drawn which showed results consistent with preeclampsia. Obstetrics/Gynecology (OB) was consulted to evaluate the patient, and treatment was continued with magnesium sulfate and additional IV hydralazine. Patient was admitted to (OB) service with a significant improvement in BP and headache relief. Patient was discharged home on oral Labetalol on hospital day 2 from the OB service.

Less than 12 hours later, she was noted by her mother to be lethargic and with fixed eye deviation. She was taken to the same medical center and

intubated on arrival for low GCS. Her BP prior to intubation was 187/89. CT head after intubation revealed left caudate intracerebral hemorrhage with intraventricular extension. The neurosurgery service immediately placed an external ventricular drain (EVD). Her BP was treated with a nicardipine infusion, and she was admitted to the neuroscience intensive care unit (NSICU) for management.

Blood pressure control was achieved. Her mental status progressively improved and she was extubated on hospital day 7 and the EVD removed on day 4. She was eventually discharged from the hospital with home OT/PT. Given her significant improvement, in-patient rehab was not recommended. At her 2 month follow up with neurosurgery, she had zero neurological deficits from her preceding intracerebral hemorrhage.

Discussion

Delayed postpartum eclampsia is uncommon, and can cause a diagnostic

A Rare Complication of Post-Partum Preeclampsia



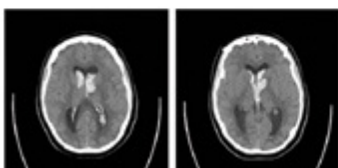
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Introduction

- Postpartum preeclampsia can result in severe long term complications for a new mother.
- It is one of the most feared postpartum medical complications emergency medicine physicians will encounter.
- Progression from HTN to seizures and intracranial hemorrhage is extremely uncommon
- Early recognition of late onset preeclampsia, defined as greater than 48 hours postpartum is crucial in minimizing adverse outcomes

CT Images

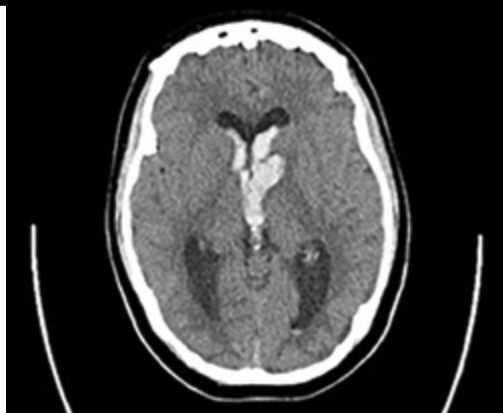
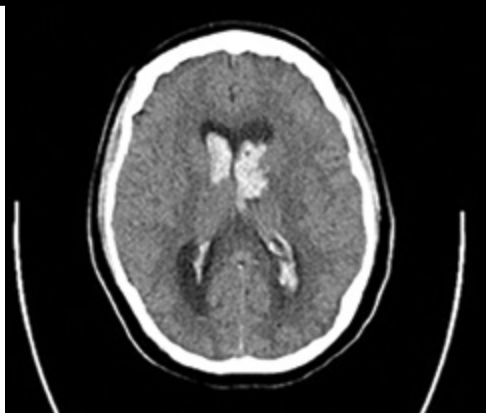


Case Description

- 24 year old female (G1P1) presents to ED on postpartum day 6 with c/o headache x1 day that is unrelieved with over the counter medications.
 - Initial BP: 155/86
 - Given IV fluids, Toradol, Compazine, and Sumatriptan with no improvement
 - CT/CTA head done to rule out subarachnoid hemorrhage was normal
 - On reassessment, BP 206/97. Treated with IV Hydralazine. labs drawn and consistent with preeclampsia.
 - Consult to Obstetrics/Gynecology to evaluate patient and treatment continued with 6 grams magnesium sulfate and additional IV Hydralazine
 - Patient admitted to OB service with improvement in BP and headache relief
 - Discharged home on PO Labetalol on hospital day 2 from OB service
-
- Patient returned 12 hours after discharged to ED. Patient noted by mother to be lethargic with fixed eye deviation
 - Intubated on arrival for low GCS. BP prior to intubation 187/89
 - CT head revealed left caudate intracerebral hemorrhage with intraventricular extension
 - Neurosurgery service immediately placed external ventricular drain (EVD)
 - BP treated with nicardipine infusion, and she was admitted to neuroscience intensive care unit (NSICU) for management
-
- BP control was achieved in intensive care unit
 - Patient had EVD removed on day 4 and was extubated on day 7
 - Discharged home with occupational and physical therapy
 - Given significant improvement, in-patient rehab was not recommended
 - At 2-month follow up with neurosurgery, on exam, patient with zero deficits from intracerebral hemorrhage

Discussion

- Delayed postpartum preeclampsia is uncommon, and can cause a diagnostic dilemma for emergency physicians.
- It is often overlooked as a differential diagnosis in postpartum women. Especially those with uncomplicated pre-partum and ante-partum courses, and no prior history of hypertension
- Preeclampsia can consist of many prodromal symptoms including HA, visual changes, right upper quadrant pain, and HTN.
- Preeclampsia in the postpartum period should be considered in any postpartum woman who presents with these symptoms
- If/when this diagnosis is made, aggressive treatment with anti-hypertensives and magnesium sulfate is indicated to minimize progression to eclampsia and possible intracerebral hemorrhage
- In this case, timely placement of EVD as well as aggressive management of the patient's hypertension ultimately resulted in a favorable outcome.



dilemma for emergency physicians. It is often overlooked as a differential diagnosis in postpartum women, especially those with an uncomplicated prepartum and antepartum course and no prior history of hypertension. Eclampsia can consist of many prodromal symptoms including headache, visual changes, right upper quadrant pain, and hypertension. Therefore, a differential diagnosis of postpartum eclampsia should always be considered in any postpartum woman who presents with these symptoms.¹ Preeclampsia in the postpartum period is a serious diagnosis;

if/when this diagnosis is made, aggressive treatment with antihypertensives and magnesium sulfate is indicated to minimize progression to eclampsia and possibly intracerebral hemorrhage.² In this case, timely placement of external ventricular device (EVD) as well as aggressive management of the patient's hypertension ultimately resulted in a favorable outcome.

Conclusion

Postpartum preeclampsia is uncommon, and it can be easily overlooked as a diagnosis when a postpartum patient has no prior symptoms of preeclampsia.

At one time, it was thought that women could not develop eclampsia if they did not have preeclampsia during pregnancy; however, this has been found to be untrue. A review of the literature found postpartum eclampsia in a woman as far out as 8 weeks postpartum.³ We must be diligent when constructing a list of differentials for the postpartum patient. Any recently postpartum woman who presents with prodromal symptoms requires early detection and aggressive treatment of pre-eclampsia/eclampsia. This is critical in preventing adverse effects like intracranial hemorrhage. ★

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A Different Kind of Therapeutic Hypothermia

Zaid Altawil, MD
Boston Medical Center

Case

You are called to the trauma room while on an overnight shift. A 52-year-old man became unresponsive during dinner. His family called 911. The paramedics arrive to your resuscitation room performing CPR on the patient. He is hooked up to a cardiac monitor and the rhythm shows asystole.

You begin resuscitation according to ACLS guidelines in an attempt to revive the patient. While he is being undressed, the nurse notes that the patient is wearing a necklace and bracelet engraved with the following:

**IN CASE OF EMERGENCY CALL
800-XXX-XXXX. IN CASE OF DEATH
PUSH 100,000U HEPARIN IV
DO CPR WHILE COOLING WITH
ICE TO 10 C
KEEP PH 7.5
NO EMBALMING
NO AUTOPSY**

You have never seen this before. A social worker calls the number and it connects to an agent who informs you that the patient has an advanced directive, and he would like to be preserved after death. He asks you to follow the aforementioned instructions while he dispatches a stand-by team to collect the patient and start their biostasis protocol.

On further inquiry, he informs you that the patient is a member of a cryonics society. His goal is to be cryopreserved, in hopes that one day medical technology is advanced enough to revive him and bring him back from death. Your resuscitation attempts are unsuccessful, and the patient remains in asystole. What's your next step?

About Cryonics

Cryonics is the science of preserving human bodies with the hopes of one day being revived by advanced future medical technology. By being preserved in a state of suspended animation, patients who choose to undergo cryopreservation hope that the afflictions leading to their death can be managed successfully and they can resume their lives.

Cryopreservation is achieved through a process of *vitrification* where high concentrations of chemicals called *cryoprotectants*, such as glycerol, replace the water in cells and tissue such that they can be cooled to temperatures below freezing. The process is similar to that used to preserve human embryos and sperm cells, but in this instance the entire body (or central nervous system) is preserved.

Once preservation is achieved by this process, patients are suspended in liquid nitrogen in long term storage, where they will remain indefinitely until the day human medical knowledge will advance to a point where this process can be reversed.

Cryonicists (as they call themselves) hope the medical technology of the future will be able to treat whatever medical problems the patients were afflicted with prior to their preservation, and lead to a more prolonged and fulfilling life.

Why Should We Care?

As much as this sounds like science fiction, there is a surprisingly significant number of people who have enrolled in such programs. As of September 2018, there exist about 2,704 individuals in the United States who are enrolled in programs offering cryopreservation.^{1,2}



Additionally, 322 patients are currently cryo-preserved — and that number is expected to rise in the coming years.

While there is much heated debate about this process in the scientific community, with most scientists labeling it pseudoscience and outside the realm of possibility, over the past decade many hospitals have been faced with the scenario in the case outlined above.³⁻⁷ Per published case reports, cryonics specialists often have to coordinate with hospital staff (mostly ICU or, in some cases, hospice) to set up equipment, initiate procedures, and transport the patient. It seems that hospital staff are usually aware that the patient has an advanced directive relating to this procedure, and often these patients have a DNR and a no-autopsy order.

As patient enrollment rises, this scenario may become prevalent, and it is within the realm of possibility that emergency physicians will be faced with a situation completely foreign to them. As of yet, no cases have been reported in an emergency department.

Management in the ED or ICU

Going back to the case, the phone call the social worker placed would have alerted the staff at the cryonics facility. Depending on how imminent death is, a team is either placed on standby near the facility where the patient is admitted or directly dispatched to the site. In our case, the patient is being actively resuscitated with no appreciable rhythm, the team would have been dispatched directly (Figure 1).

In the emergency department, after pronouncement of death, cardiopulmonary support would continue, preferably with a mechanical device. Cardiopulmonary support would start with mechanical devices such as a Lucas.⁸ At the same time, active external cooling would begin, at first with ice-packs and then placing the patient in a portable ice bath when it is ready.

A whole automated regimen of medications is then administered to the patient, primarily to slow down the effects of ischemia, as well as anticoagulants and thrombolytics to prevent clot formation (see index for list of medications). Once stabilized, the patient is transferred to the company's facility, where blood substitution with a cryoprotectant solution is performed. The major arteries and veins are cannulated, and blood washout occurs.

The patient is then prepared for cryogenic cooldown. The temperature is dropped rapidly to -110C then slowly to -196C to prevent some of the effects of rapid cooling such as fracturing of brain tissue. Once cryogenic cooldown is completed, the patient is placed inside a vacuum-insulated, liquid nitrogen filled Dewar (think large steel cylinder). The patient will remain in that Dewar until such a time when medical technology has advanced enough to allow for resuscitation and revival.⁹

There are obvious concerns about the process detailed above. Skeptics abound, and criticisms range from the very real scientific and logistical challenges, to more abstract ethical and even spiritual concerns.^{10,11,12} Previous experiences with cryonics have shown very real problems, and the process itself still needs an extreme amount of polishing.^{3-7,13,14} There exist, however, a significant number of people in the United States who have signed up to undergo this procedure. In a somewhat similar vein to how organ donation was

practically unheard of some decades ago, it stands to reason that at some point an emergency medicine physician somewhere in the United States will wander into unfamiliar territory when confronted with an unconscious patient who has signed up to be a cryonicist. In that situation, a strong argument can be made for respecting patients' autonomy, analogous to patients refusing autopsy for religious reasons, or refusing blood transfusion or porcine products.

The trickiness of the situation lies in advocating for the patient in the face of auxiliary staff, hospital administration and risk management. The emergent nature of cardiac arrest and in-hospital resuscitation brings forth the added challenge of immediacy and time constraints. Would

there be enough time to negotiate with the hospital on behalf of the patient to allow a cryonics team onsite? In prior examples referenced, the patients were at hospice or long term care facilities, and arrangement were able to be made beforehand. However, preparation is made much more difficult if a cryonicist would succumb to acute life threatening ailment at an unexpected time and locale. Could organ donation protocols be applied to these patients, in the sense that they could be treated as a *whole body* donor? These are very real questions that may become more pressing in the future as cryonics becomes more ubiquitous (if it ever does), but for now, we limit ourselves to engaging in the mental exercise, and wonder which one of us will win the lottery and be faced with this dicey situation. ★

FIGURE 1. Cryonics Progression

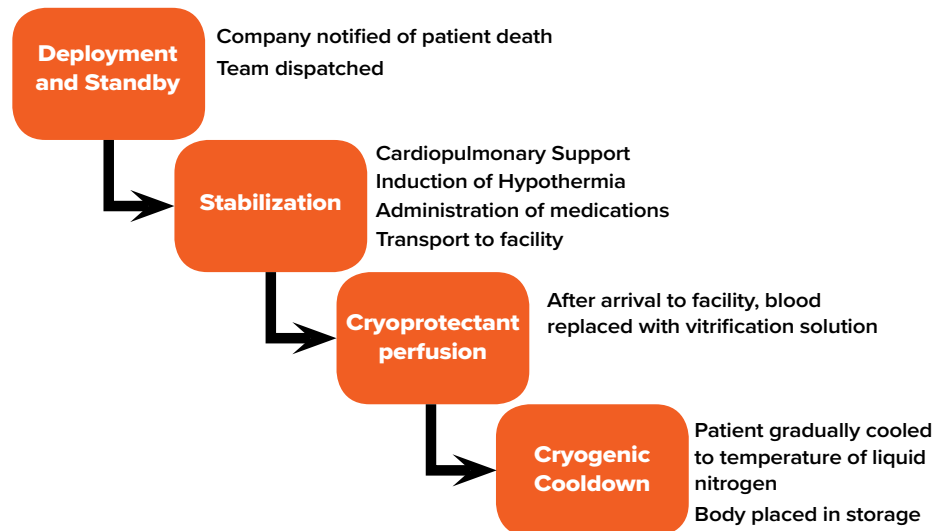


TABLE 1. Medications Given During Stabilization Phase⁹

200 mg of propofol is given to reduce metabolic demand
10-20 g of sodium citrate for anticoagulation
Streptokinase 250,000 IU for thrombolysis
Heparin 100,000 IU for anticoagulation
Aspirin 300mg reconstituted with 5 mL of THAM (trometamol; tris-hydroxymethyl aminomethane)
Vasopressin 200 IU
Epinephrine 30 mg
Niacinamide (Vit B3) 500 mg administered as a neuroprotectant
Kynurenine sulphate 1.5 g also as a neuroprotectant
Ketorolac 7.5 mg-15 mg to decrease ischemia induced inflammation
Gentamicin 80 mg to mitigate microbial overgrowth during patient transport
Vital-Oxy 70 mL, described as emulsion of melatonin, vitamin E, PBN (alpha Phenyl t-Butyl Nitron) and carprofen, another anti-inflammatory
Hetastarch 250 mL, used as a volume expander
THAM 100 mL to initiate acidosis (if not given with aspirin)
Mannitol 500 mL of 20% solution to decrease cerebral edema
Maalox as an antacid to prevent stomach erosion by acid at lower temperatures

A CASE REPORT

Tracheal Bronchus

Adam Johnson, MD

Kern Medical-UCLA ACEP/EMRA Representative

Rick McPheeters, DO

Chair, Department of Emergency Medicine
Kern Medical-UCLA

Chief Complaint

Altered mental status and abnormal lung sounds after intubation

History of Present Illness

A 47-year-old-male with a past medical history of chronic alcoholism and possible seizure disorder presented to the ED via ambulance for a grand mal seizure witnessed by a bystander. It was reported that he had been having multiple episodes of seizures preceding this event. While in the ED, the patient continued to be altered and suffered multiple subsequent seizures. The patient was intubated for airway protection. A chest radiograph was taken before and after intubation. The patient had normal lung sounds before intubation and absent lung sounds in the right upper lobe afterward.

Initial Physical Exam

Vitals: BP: 116/75, Pulse: 104, Temp: 101, RR: 16, SpO₂: 100% on room air

General: Patient was nonresponsive and post-ictal. No distress.

Neuro: Altered, unresponsive, nonverbal with minimal moans and eye opening to noxious stimuli, withdrawal noted in all extremities.

Respiratory: Breath sounds clear and equal bilaterally, no respiratory distress.

Physical Exam After Intubation

Vitals: BP: 119/76, Pulse: 105, Temp: 98.3, RR: 16, SpO₂: 100% on 100 percent FiO₂

General: Patient intubated and sedated
Respiratory: Absent breath sounds right upper lung

Physical Exam After ET Tube Retracted 2 cm

Respiratory: Clear and equal lungs sounds throughout

Pertinent Radiology

Initial CXR showed no acute disease. Post-intubation chest radiograph demonstrated right upper lobe consolidation with volume loss, which was not present on the initial film. Tip of the endotracheal tube was 10 mm above the carina. Chest radiograph after endotracheal tube retracted 2 cm showed partial resolution of the right upper lobe consolidation.

- Aspiration or anatomical abnormality such as tracheal bronchus are the key etiologies behind this post-intubation radiographic finding.
- Look for specific lung sounds and physical exam findings with this abnormal CXR, including increased fremitus on the side with consolidation, dullness to percussion, absent breath sounds or crackles, or increased vocal resonance.

Case Discussion

It is generally important to repeat radiographs after certain procedures, especially with intubation. In this case, the patient was found to have an anatomical variant called a tracheal bronchus. In 0.1-5% of the population there is a right superior lobe bronchus arising directly from the trachea proximal to the carina.

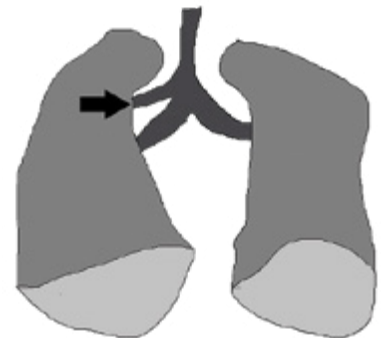
It can have multiple variations and, although usually asymptomatic, it can be the root cause of emphysema, atelectasis, hemoptysis, and persistent or recurrent pneumonia.

Computed tomography is the best modality for assessing the anatomy and allows direct visualization and orientation of the anomalous bronchus.

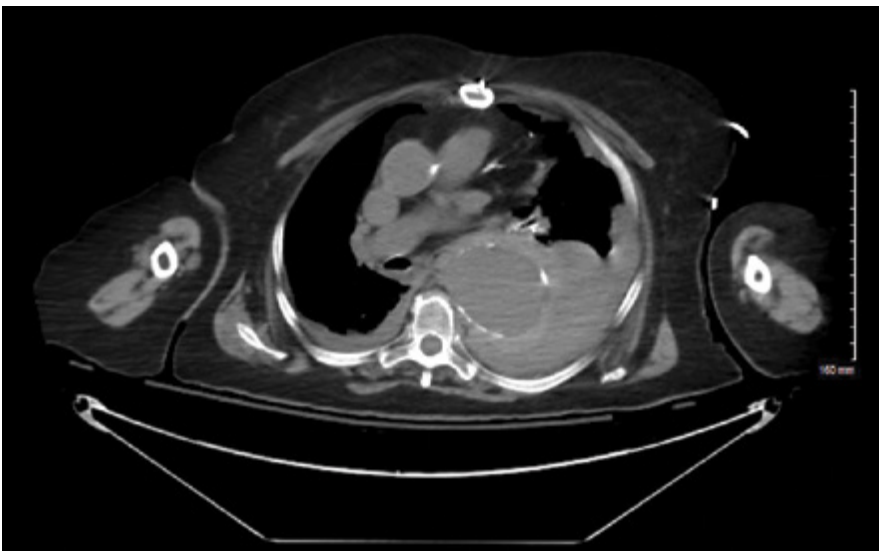
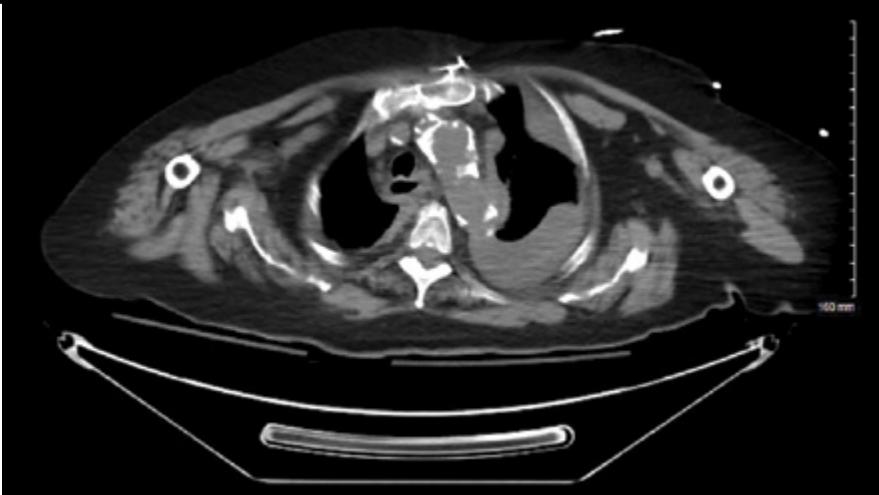
It is important for physicians who perform advanced airway management to be knowledgeable about this anatomical variant, so that prompt recognition can prevent delays in diagnosis and management in the acute care setting.

PEARLS

- Significant change in lung sounds after intubation can alert us to complications, and if lungs sound are abnormal in the right upper lobe it could be caused by a tracheal bronchus.
- Knowledge of anatomical variations and complications of procedures can allow for quick identification, management, and improved outcomes. ★



In 0.1-5% of the population there is a right superior lobe bronchus arising directly from the trachea proximal to the carina.



Rupturing Thoracic Aortic Aneurysm

Caroline Trippel, DO
Brandon Regional Hospital

Ruptured thoracic aortic aneurysms are almost uniformly fatal, with a mortality rate of 97-100%.¹ Early detection and intervention are essential to keeping your patient alive.

A CASE REPORT

Case

A 98-year-old woman with past medical history of hypertension, chronic kidney disease stage III, hyperlipidemia, congestive heart failure, and coronary artery disease status post two-vessel coronary artery bypass graft in 2001 presented to a high-volume, suburban emergency department in Florida by EMS with complaint of left-sided flank pain at 6 am.

Her vitals were BP 110/59 mmHg, HR 87 bpm, RR 18 bpm and temperature 36.6°C during transport and on arrival. The patient was alert and oriented on initial exam but in moderate discomfort. History was initially limited due to a language barrier and patient distress. The patient reported upper abdominal pain and left flank pain that started the previous night. She became acutely altered in the exam room with a left-sided gaze deviation. Her vitals remained unchanged and her altered mentation resolved after a period of 1-2 minutes. She was rushed to CT for emergent neurologic imaging as well as imaging of the chest and abdomen.

Non-contrast CT of the abdomen and pelvis showed a ruptured thoracic aortic aneurysm [Figure 1] with hemorrhage into the mediastinum and throughout the left pleural cavity with two pseudoaneurysms of the descending thoracic aorta, the largest and most distal of which extended over 6 cm in length and 5.6 cm in depth.

The family was informed of her diagnosis and prognosis and were at bedside. The patient was given comfort measures per family wishes. The patient expired shortly thereafter with PEA arrest.

Total time from patient arrival to expiration was 30 minutes. ★

DISCUSSION

Ruptured thoracic aortic aneurysms are almost uniformly fatal, with a mortality rate of 97-100%.¹ Early detection and intervention are essential to curbing this mortality rate. Risk factors for this patient included advanced age, hypertension and atherosclerosis.^{2,3}

This case demonstrates a rare visualization of an actively rupturing thoracic aneurysm and a non-classical exam presentation. ★

ABMS Subspecialty Certification in Neurocritical Care

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In June 2018, the American Board of Medical Specialties (ABMS) approved subspecialty certification in Neurocritical Care (NCC), which is co-sponsored by the American Board of Anesthesiology (ABA), the American Board of Emergency Medicine (ABEM), the American Board of Neurological Surgery (ABNS), and the American Board of Psychiatry and Neurology (ABPN).^{1,2} Once fully implemented, NCC will become the 10th ABMS-certified emergency medicine (EM) subspecialty, and graduates of NCC fellowships will be eligible for board certification in NCC.³

I had the opportunity to speak with an expert in neurocritical care and emergency medicine, Dr. Evie Marcolini, to learn more about the fellowship and what ABMS certification means for graduates of EM residency programs. Dr. Marcolini is an Assistant Professor at the University of Vermont Medical School, where she is also the Director of Critical Care Education in the Division of Emergency Medicine as well as the Neurocritical Care Fellowship Director in the Department of Neurology.

What is a neurocritical care fellowship?

This is a 2-year fellowship offered to graduates of residency programs in Anesthesia, Emergency Medicine, Neurosurgery, Psychiatry, and Neurology. Board-eligible or board-certified graduates (MD/DO) may obtain fellowship certification through the traditional two-year training pathway, or those already in practice and board certified by the United Council for Neurologic Subspecialties (UCNS) may sit for a board exam to receive certification.

“A neurocritical care fellowship is a 2-year fellowship offered to graduates of residency programs in Anesthesia, Emergency Medicine, Neurosurgery, Psychiatry, and Neurology.”



American Board of Medical Specialties

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Is the neurocritical care fellowship new?

Board certification for NCC was established in 2005 and has been accredited by UCNS and the Society for Neurological Surgeons Committee on Advanced Subspecialty Training (SNS-CAST). There are currently 61 UCNS-accredited NCC fellowships and 22 SNS-CAST accredited fellowships in the U.S.⁴

What is the benefit of an ABMS-certified NCC fellowship?

ABMS-certified fellowships are the *gold standard*, and bringing the NCC fellowship under the ABMS will afford the subspecialty resources to improve training. As more physicians train in NCC, fellow oversight and education will become more standardized. NCC is a relatively new subspecialty, which means Neuro ICUs are currently run by physicians boarded in neuro critical care, critical care medicine, surgical critical care, or anesthesia critical care.

What are the career options for graduates of NCC programs?

Graduates may choose to spend their clinical time completely in the emergency department (ED) or in the Neuro ICU, or may choose to split their time between the two. Many community hospitals will likely not have a dedicated Neuro ICU, so graduates may choose to work clinically in a mixed ICU caring for all patients whether they are Medical-, Surgical-, Cardiovascular-, or Neuro ICU patients.

Who would be interested in applying to NCC fellowship programs?

When choosing a critical care fellowship, emergency physicians now have all specialties to choose from: Medicine, Surgery, Anesthesia, and Neurocritical Care. Each specialty has different nuances. In the Neuro ICU, patients have complex physiology, both neurologically as well as generally. Neurocritically ill patients are also at risk for respiratory failure, sepsis, and even intraabdominal pathology. The typical Neuro ICU patient has had a sudden devastating illness and they as well as their families are dealing with the emotions and dynamics of understanding the physiology and making life decisions. A great neurointensivist will embrace the pathophysiology as well as the opportunity to help patients and families navigate the uncharted territory of a devastating disease process.

Is there anything else you think EM residents should know about this announcement?

I hope that folks are excited about this development! Please contact me if you have any questions or just want to talk about critical care fellowships in general.

As far as the NCC fellowship, here are some thoughts: Know what EM brings to the table that other specialties do not, but also recognize what EM training does not provide. We are airway experts; endotracheal intubation is essential to our job. We're skilled at interpreting ECGs, and we're responsible for management of everything from the neck down, as well as above. We see patients with neurologic complaints all the time, and we are solely responsible for the initial management of their acute concerns.

While EM grads have many strengths, we don't have as much experience with the longer-term management of common diseases such as CNS based tumors, or rare entities such as NMDA receptor encephalopathy. A Neurocritical care fellowship will be a time to increase knowledge and skills in areas that EM doesn't typically focus on, such as neuroimaging or electroencephalographic monitoring (EEG).

What would you recommend to current EM residents who are interested in pursuing a NCC fellowship?

Above all else, show interest in NCC through scholarly activities and electives. Gain experience (to make sure you will actually like NCC) by doing a rotation in a Neuro ICU. Expand your skillset through rotations in neurology and neuroimaging.

Any recommendations for EM residents who are interested in critical care, but are still unsure which path to choose?

Think about what is important. How do you want to spend your time? What specialists do you want to work with? Know why you are pursuing a critical care fellowship. There are many EM grads that say they want to do a critical care fellowship because they think it will make them better EM physicians, but this may not be true and certainly is not a great reason to spend two years in the Neuro ICU! The ICU and the ED are very

different, and each requires a specific way of thinking. The best reason to pursue a critical care fellowship is because you love it!

Additional Details

The ABMS formally approved the subspecialty certification in June of 2018, and a proposal is being sent to the Accreditation Council for Graduate Medical Education (ACGME) for accreditation recognition of the NCC subspecialty. It is anticipated that the first ABMS-recognized board certification exam will be offered in 2020 or 2021.^{1,2,4,5} Until details on the transition are finalized, fellowships will continue to be accredited by the UCNS and SNS-CAST, and EM graduates may apply to NCC fellowships through the San Francisco Match.

For further information about Neurocritical Care Fellowship Programs, check out the [EMRA Fellowship Guide](#) or reach out to Dr. Marcolini at emarcolini@gmail.com. ★

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Underrepresentation of women in academic medicine persists. Women comprise 47% of medical school entrants and only 21% of full professors in academic medicine in the United States.

#FEM@BCM

A Response to The Call for Equality, Mentorship, & Leadership

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Underrepresentation of women in academic medicine persists. Women comprise 47% of medical school entrants and only 21% of full professors in academic medicine in the United States.¹ The gap between men and women in academic medicine is evident, and multiple groups in emergency medicine, including ACEP, EMRA, SAEM, AAEM, and CODP, advocate for

diversity and inclusion.² The solution begins long before residency, but our access to trainees and ability to diversify our workforce and promote embracement begins here, in residency.

As EM physicians, we strive for excellence in all aspects of EM training and practice, providing care for all comers at all times, regardless of race, gender, socioeconomic status, disability, or access to care. Achieving this goal demands formal education and training in diversity, inclusion, and health care equity. At the Baylor College of Medicine (BCM) EM residency program, we incorporate this into our curriculum and promote this outside of formal didactics.

Creating a cultivating and supportive environment for women in EM has been an ongoing effort in our community, yet we continue to have difficulty closing the gender gap. Various hypotheses regarding the etiology of this gap exist, from contrast in clinical performance to varying numbers of academic publications; however, most of these

theories have been debunked by recent literature. There is no difference in clinical practice between male and female EM physicians in regards to patient evaluation, diagnostic tool use, patient dispositions and 72-hr ED revisit rates, according to a study across four emergency departments in Taiwan.³ Another study states that female faculty lag in academic productivity, publishing significantly less articles in peer-reviewed journals than their male counterparts;⁴ however, that same year a study found there is no discrepancy between the proportion of female academic EM faculty and female academic EM authorship.⁵ Female residents are not immune either, with a study finding that although male and female EM residents received similar evaluations at the beginning of residency, the rate of milestone attainment was higher for male than female residents.⁶

This is not prevalent only in EM. Studying 1.5 million Medicare patients found that those who were treated by a female physician were less likely to die or

be readmitted to the hospital within 30 days than those patients treated by a male physician.⁷ 100,000 surgical patients found the same effect: patients who were operated on by a female surgeon were significantly less likely to die within the next 30 days.⁸ For over 500,000 patients who experienced a sudden heart attack, any patient treated by a female physician was more likely to survive, compared with those treated by a male physician.⁹ Despite all of this data demonstrating either equivalent or superior performance, a study looking at 91,073 physicians with medical school faculty appointments found that even after accounting for age, years post-residency, specialty, and research productivity, male faculty are much more likely to obtain full professorship than female faculty.¹⁰

Given that women physicians provide the same quality of care³ and publish proportionately to their male counterparts,⁵ it is unclear the reason women physicians are underrepresented in leadership positions and in EM as a whole. So, what can we DO about this?

Different models were assessed at 23 institutions and found that many medical schools lack a program supporting gender equality.¹¹ Of those institutions who do have programming, they largely target the individual through mentoring, networking, child care and spousal hiring programs. However, Carr et al. found that programs are lacking efforts at the academic community and policy levels.¹¹ Few institutions have faculty development programs or diversity and inclusion policies in place to support recruitment, retention and promotion of female faculty despite evidence that national professional programs such as the Hedwig van Ameringen Executive Leadership in Academic Medicine for Women (ELAM) are beneficial in regards to career advancement.¹²

At BCM, our EM Department conducted a needs assessment as our first step in identifying the gravity and breadth of the problem. We found the following key points:

1. There are currently not enough women leaders in EM
2. No women in our department were above the Assistant Professor level

3. There is no policy to protect breastfeeding women in the BCM EM Department when they need to go pump while on shift
4. There is no formal education on gender equality within EM

We took our findings and established FEM@BCM: Females in Emergency Medicine at Baylor College of Medicine. Our mission is to promote the advancement and equality of women in EM by mentoring and inspiring leadership. Service is a key component to our goals because we want to be supportive of our community and better understand the scope of issues facing local women. Our inaugural event included a clothing and suit drive called *Dress for Success* with the goal to empower women to achieve economic independence by donating professional attire needed for professional opportunities. We created a mentor network for our residents that included current faculty and past graduates of our program — a great opportunity to get local alumni involved.

Recognizing individuals who support diversity and inclusion is paramount to our future success. We annually award faculty, APPs, residents and nursing staff who support women in academic EM individually and through organizational initiatives addressing the gap in recruitment, promotion, development and advancement of women physicians. At the institutional level, our college

awarded eight women in our department as *Women of Excellence*; the awardees included faculty, APPs, residents and administrative staff.

We organized social and networking events for our residents, created and distributed awards to our residents and faculty who demonstrated commitment to advancing and promoting diversity, inclusion and women in EM, and successfully applied for multiple FIX18 and AWAEM resident scholarship awardees.

At the policy level, FEM@BCM established a Lactation policy and secured our department's first hospital-grade breast pump. We are currently working on plugging in our faculty to our institution faculty development programming and seeking out women at higher levels to come and speak to provide remote mentorship. Being part of a program that is actively looking for ways to not only support and advance women in EM but also supporting diversity on other fronts is key.^{13, 14} FEM@BCM is the tip of the iceberg and the first group in our department's Diversity and Inclusion in EM initiative. We support women in EM by fostering gender equity both inside and outside of the workplace. We seek positive social change and advancement of women in EM through education, empowerment, and advocacy. We will inspire our community through mentorship and leadership. ★



A Podcast by Residents, for Residents



Sara Paradise, MD
EMRA Director of Education
UC Irving
@saraparamd

Podcasts are nearly ubiquitous in emergency medicine. Whether it be medical content, stories from the emergency department, or the latest and greatest in EM research, it's impossible to ignore the impact that podcasts are having on the modern resident learner. In fact, in a 2017 study of more than 300 emergency medicine residents, 88.8% listen to podcasts at least once a month, with 72.2% of listeners stating it impacts their clinical practice either "somewhat" or "very much."¹

So, with the numerous podcasts already out there, WHY **EMRA•Cast**? What "gap" are we trying to fill? As a junior educator and consumer of many of these products, I began to notice a few things:

- 1. Residents have a tough job, and we don't talk about that enough.** While all EM docs have a tough job, residency is especially difficult. Ran your first pediatric code and cried the whole way home? We did too. Get in a heated argument with a consultant? Yep. Your family/partner is upset because you're "never home?" We've been there. We hope to shed light to some of the things you're going through in a thoughtful way, and provide support where and when you need it.
- 2. A resident's knowledge level often differs from that of the podcast hosts and guests.** For example, I was recently listening to a clinical case on a popular podcast, and the host said, "Of course we know where you're going with this case..." I thought to myself,

"...but most of us [residents and junior learners] WOULDN'T know, or would want more clarification here." While there are some podcasts tailored to the resident level of knowledge, having residents host the podcasts allows us to inherently ask those questions that "experts" wouldn't think to ask. We want to better represent the 15,000+ EMRA members out there, and for our hosts to look, talk, and think similar to you. We'll feel comfortable asking the "dumb" questions for you, in order to make you look smart on your next shift!

3. There are a number of residents really interested in podcasting!

One of the main goals of this project was not only to produce a podcast, but also to create a podcasting curriculum and mentorship opportunity for residents interested in developing this skillset. And clearly there are many; when we opened up a call for **EMRA•Cast** hosts, we were overwhelmed with the number of applications we received, and ultimately ended up expanding the number of spots we offered to 5 for our inaugural year. We found an early mentor in Andy Little, DO, of Doctors Hospital in Ohio, who himself had recently gone through a lot of trial and error in creating his own podcast, *EM Over Easy*[®], and wanted to help mentor junior podcasters.

So, with that, enter **EMRA•Cast**. We're learning very quickly that the podcasting community is extremely tight-knit, extremely humble, and extremely generous with their time. We are so excited to start releasing episodes, and we look forward to hearing your ideas for the future of the podcast.

Get to Know Your Hosts

Isaac Agboola, MD

PGY1, Yale New Haven Medical Center

What historical person would you want to interview for a podcast if you had the chance?



There are a multitude of great choices, but if I had to choose one and only one I would probably choose Barack Obama. Regardless of how you feel about him politically, I think he is a very interesting man. I would like to hear about his Kitesurfing adventures, why he doesn't like ice cream, and his thoughts on hip hop. There would also be plenty of room for questions on health care and other expected topics.

Favorite time to get work done?

First thing in the morning post a gym session — when the sun is out and my mind is clear.

What's your nerdiest trait?

I would consider myself a low-key nerd. I LOVE superhero shows and movies, even the bad ones. Which is probably because, I feel deep down everyone should be the hero in their own life story. I will occasionally peruse some anime and manga, but who doesn't love a little Dragon Ball Z?

Why EMRA•Cast?

Why not EMRA•Cast? I think podcasting is a wave of the future. It's education and think pieces that you can listen to on the go. Outside of that my mission is to diversify the face of emergency medicine, highlighting and showcasing the diversity of our specialty for all to see.

Alexander Kaminsky, MD
PGY2, University of California – Fresno

What historical person would you want to interview for a podcast if you had the chance?



So many amazing people to choose from! If I had to choose only one person, I would probably pick Leonardo Da Vinci. There is so much mystery around him. An artist who prided himself more a scientist and engineer. A dreamer of such wondrous ideas, many of which sparked or influenced future discoveries and inventions. An artist with such a deep understanding of the human form, and yet born in an era when it was unlawful to study the human body. He is the epitome of renaissance man.

Favorite time to get work done?

In my sleep, so I can avoid doing it... Realistically, after a slow morning once I've had my coffee with an open day of no obligations ahead of me. Which of course as an EM resident is not a reality.

What's your nerdiest trait?

I have a pretty secret and yet substantial collection of Marvel Comics.

Why EMRA•Cast?

I am a huge fan and consumer or medical podcasting. My own learning style is centered around discussion and audio. Less lecture, more conversation. Listening to others conversations is a great surrogate and gets me thinking. Things stick even better when sprinkled in with a little humor. I have a personal interest in medical education but am not entirely sure if that means academia, or some other medium. I had a brief exposure to podcasting in medical school, so when the opportunity arose to join EMRA — I knew it would be an awesome fit!

Tiffany Proffitt, DO
PGY3, Lakeland Health

What historical person would you want to interview for a podcast if you had the chance?



I'm always terrible at these types of questions. My gut instinct is Rosalind Franklin. I'd want to talk to her about her contribution to the discovery of the

DNA double helix — did she have this 'ah-ha' moment when she captured that structure? Did she even think it was a big deal or was it just another project among her many? Did she like working on the molecular structure of viruses more or less than DNA and RNA? What words of advice or encouragement does she have for women in science and medicine today?

Favorite time to get work done?

When my kids are out of the house! But preferably early morning.

What's your nerdiest trait?

Right now probably my extensive knowledge of toddler songs and dance moves, but it used to be my love of rare and deadly pathogens and my dream of becoming a viral epidemiologist working in the CDC's level 4 lab.

Why EMRA•Cast?

I'm passionate about medical education and making core content accessible in a fun and easy way for residents. As a mom I'm always trying to find ways to maximize my limited free moments and podcasts fit in perfectly. It also goes without saying that I'm interested in gender disparities in medicine and I want to be an uplifting voice of hope to my fellow women in medicine, especially the mama docs!

Miguel A. Reyes, MD
PGY2, Hackensack University Medical Center

What historical person would you want to interview for a podcast if you had the chance?



I'd want to interview Banksy, the infamous artist. What motivates her/him, why so secretive? Why not get the fame and fortune if it's right there? So many questions.

Favorite time to get work done?

As soon as I get up. I find that when I first get up I feel the most invigorated to be productive and knock things off my to-do list.

What's your nerdiest trait?

I read a LOT of comics and science fiction. I also tend to collect little nerdy trinkets like superhero badge holders and pins to put on my ID.

Why EMRA•Cast?

Because I wanted to get more

involved in the EMRA community and I thought pod casting would be fun. I listen to a ton of podcasts and really interested in the #FOAM community and I thought this would be a fun way to get involved with that.

Jessie Werner, MD
PGY3, Brown University

What historical person would you want to interview for a podcast if you had the chance?



This is a tough question! I think I'd like to interview my maternal grandmother. She grew up on a farm during the Great Depression and was the first person in her family to graduate from high school. She's not really a "historical person," but she passed away before I was old enough to ask her about her life and I'd love to know her better.

Favorite time to get work done?

I never thought I'd say this, but somehow I've become a morning person. I think med school taught me to use every bit of time (because we have so little!). I'm definitely most efficient and productive just after I wake up and have that first cup of coffee. But don't get me wrong, I love to sleep in when I can.

What's your nerdiest trait?

I think I have several nerdy traits, but if I had to choose just one it would probably be my obsession with the BBC version of *Pride and Prejudice* from 1995. I've watched that mini-series like 50 times and it never gets old. Colin Firth as Mr. Darcy? Swoon.

Why EMRA•Cast?

I've been lucky to have an amazing faculty mentor, Gita Pensa, who introduced me to podcasting. Through her I became more interested FOAMed and was incredibly fortunate to do an elective with Jess Mason out in California. When I heard EMRA was starting a podcast I knew I wanted to be a part of it. I love being involved with EMRA and learning from some of the most accomplished physicians out there. Furthermore, I wanted to help create a podcast that speaks directly to residents and residency issues. Residency can be challenging and I hope that **EMRA•Cast** will provide residents with a sense of camaraderie and support. ★

When the Steaks Are High

Joseph S. Schreiner, MSIV

Philadelphia College of Osteopathic Medicine
@josephschreiner

I was 21 when I first became a doctor. My scrubs were a black button-up dress shirt from Kohl's and an apron covered in steak sauce. My operating theater was a dining hall full of aghast Pennsylvanians. I scrubbed in by sanitizing with a moist towelette and taking a deep breath. I was whisked away to the commotion by my colleagues. They shouted, "Joe's a doctor! Joe's a doctor!"

The truth, which you have already figured out, is that at 21, I was not a doctor. I was a server at Outback Steakhouse, and I had just been thrown into my first critical care scenario. Sure, I had longed for the day I would enter medical school with the eventual goal of becoming an emergency physician, but this was not the swearing-in I had imagined.

"She's choking!" they shouted.

The patient was an 80-something-year-old female status-post alimentary assault by an unidentified sirloin. She was alert but distressed. Review of systems seemed positive for choking. On exam she looked like she was choking. I made my diagnosis: choking. Given the desperation on the faces of crowd, she was not going to stay stable for long. I was her only hope.

I would not disappoint.

At that moment I became Dr. Joe, the Doogie Howser of Bucks County. This was my patient, and it was my job to make her well.

I knew the Heimlich maneuver. Well, I knew *of* the Heimlich. It was like a friendly punch to the gut, right? One thrust; nothing. Two thrusts — still nothing. Three thrusts. Nothing. No budging.

"She's turning blue, Dr. Joe! Do something!"

She went limp in my arms, and

breathing ceased. I felt for a pulse and unsurprisingly, there was none. I was losing her. I laid her down and looked around. Now what? My nurses were frozen in place. My ED was starting to look a lot more like a restaurant again. The crowd was closing in.

No, I would not panic. I needed to think.

"Save her, Dr. Joe!"

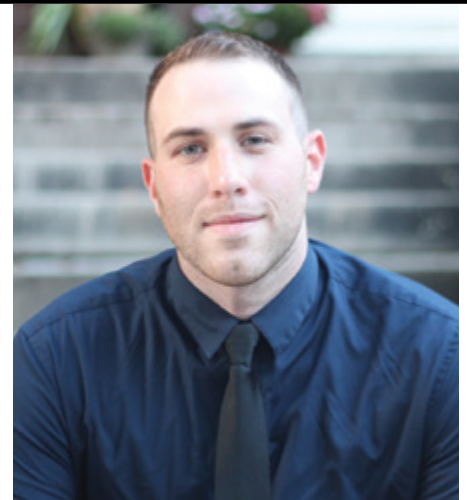
The summer prior I had taken a CPR course at the behest of my mother (my attending physician, you might say). I knew what came next. It was a Code Red. And not the Code Red we call when we run out of Bloomin' Onions. No, for the next 15 minutes I pumped my patient's chest to the tempo of "Stayin' Alive" like her life depended on it. Because, well, it did.

It was then the paramedics arrived. They were appreciative. After all, they were in presence of Dr. Joe, makeshift medicine man of Outback Steakhouse. They knew I was a little wet behind the ears. Maybe it was just sweat. Nonetheless, they thanked me and took my patient away. She would go off to inpatient, I would return to my tables. The mayhem ended just as quickly as it began.

For the time I was happy to be just another 21-year-old again. I went home and hung up my black apron, my one-time superhero's cape. I longed for the day I could replace that with a white coat. I wiped my brow and took my first long breath. For then, at least, you could say Dr. Joe was taking a sabbatical.

Days later I received the bad news. I learned my patient did not survive the ordeal. She had suffered an anoxic brain injury, and three days after was taken off life support. I also learned that in my fervent attempts to preserve my patient, I broke nearly every rib in her body. You could almost hear Hippocrates rolling in his grave.

I was crushed.



Maybe my cape needed to stay folded on the shelf. Maybe Dr. Joe was not all he was cracked up to be. Or maybe I was just a 21-year-old kid who jumped into the fray when no one else would?

I dreaded returning to work on my next shift. I could already feel the scowls and the whispers and the disappointed jeers. Yet, first thing I felt was a slap on the back. "Great job buddy," I heard. "You're the man!" "Fantastic work!" "Way to go, Dr. Joe!" Surely they had heard the news, right?

"Why is everybody congratulating me?" I asked a coworker. "She didn't make it."

"So what?" he said. "You jumped right in, when everybody else was watching. That took guts." *Guts*, I thought. I guess it did.

I knew I could not blame myself for what transpired. After all, I was thrust into an implausible scenario. I assumed a role to the best of my ability with the skill set of a Samaritan. What others saw is my ability to maintain composure, continue thinking, and tune out the distractions while under pressure. I was given the gift of an unfortunate event that would inspire me to hone my craft.

I want to pursue emergency medicine because it is what I was born to do. I may not be some superhero or Dr. Joe the amazing juvenile doctor, but with the right training I can achieve even greater than that. You can teach a person how to do a proper Heimlich and perform effective CPR, ideally without cracking every rib. What you cannot teach is to have guts and a willingness to help. ★



EM Residents' Appreciation Day

Hey! Let's step up the game for EM Residents' Appreciation Day — it's March 6, 2019. How will you celebrate?

It doesn't take a massive investment of time or resources to make sure the residents who help provide 24/7/365 coverage in the ED know they're vital members of the team. Free food, public recognition, social shout-outs, even a sincere word in passing — these gestures matter. Make appreciation part of your culture this year! ★

ABMS Approves FPD in Advanced EM Ultrasonography

The American Board of Medical Specialties has approved a Focused Practice Designation in Advanced Emergency Medicine Ultrasonography. Only ABEM-certified physicians will be eligible for this designation.



American Board
of Medical Specialties
Higher standards. Better care.®

While residency-trained emergency physicians have acquired basic expertise applying ultrasound in the ED, physicians who specialize in AEMUS will have acquired a greater breadth and depth of knowledge in advanced techniques, research, and quality improvement skills.

Fellowship training is required. There will also be a time-limited training-plus-practice pathway, and a practice-only pathway. Candidates must pass a written exam to earn this designation. The first exam will be offered no earlier than 2021. An implementation timeline and eligibility criteria will be available on the ABEM website at abem.org as they become available. ★

Get Published in *Annals of Emergency Medicine*

The *Annals of Emergency Medicine* Residents' Perspective Section is now accepting abstract submissions from EM residents and fellows, according to Mariam Fofana, MD, PhD, editorial board resident fellow for 2018-2019.

Authors of promising abstracts will be invited to submit a full manuscript for peer review. This year, *Annals* is interested in (but not limited to) 3 particular themes:

1. Impact of race and racism on medical training
2. Threat of de-skilling due to technological advancement
3. How physicians engage in political discourse as individuals and as a profession

Abstracts are limited to 300 words and should be double-spaced. Submit your abstract via *Annals'* online submission system, Editorial Manager, at editorialmanager.com/annemergmed (select the "Residents' Perspective" article type). Invited manuscripts will undergo the same peer review as all other submissions to *Annals*. More information for authors can be found at annemergmed.com/content/categories#residentperspective, or by emailing annalsfellow@acep.org. ★

ABEM Subspecialists No Longer Required to Maintain EM Certification

Physicians certified by the American Board of Emergency Medicine (ABEM) who also hold an ABEM-issued



subspecialty certificate are no longer required to maintain core EM certification as long as they are participating in an ABEM-accepted Maintenance of Certification

Program. ABEM believes physicians who continue to practice emergency medicine in addition to their subspecialty should continue to maintain their EM certification. Acceptable MOC programs include.

The positions include travel reimbursement for in-person meetings during CORD Academic Assembly in the spring and ACEP Scientific Assembly in the fall. In addition, committee leaders are invited to participate in the EMRA Leadership Academy, with yearlong networking and project development opportunities.

- ✓ The ABEM EM MOC Program
- ✓ An ABEM subspecialty-specific MOC program
- ✓ An MOC program of another ABMS Member Board that includes Lifelong Learning and Self-Assessment (LLS) and Improvement in Medical Practice (IMP) components

ABEM also worked with the American Board of Preventive Medicine to allow physicians certified in Addiction Medicine and Clinical Informatics to let their EM certification lapse if they are no longer practicing EM. Contact ABEM at 517.332.4800, ext 387, or subspecialties@abem.org with any questions. ★

45 EMRA years

established 1974

That's how long EMRA has supported physicians like you with resources in emergency medicine. You are the doctors on the front lines, holding hands and saving lives.

1974

Joseph F. Waeckerle, MD and others had an idea to form an organization for emergency medicine residents. EMRA was born.

1975

Residents joined this new organization for \$15. By the end of the decade, EMRA boasted 269 resident and 14 medical student members.

1982

EMRA officers manned a booth at Scientific Assembly that featured a bulletin board with job opportunities.

1988

Hurricane Gilbert hit Jamaica. EMRA members secured and transported medical supplies to Montego Bay.

1994

EMRA hosted the first Medical Student Forum. Membership soared to 2,581.

2000

Membership explodes to 4,320. By the end of the decade, another 2,145 were added to the EMRA membership roster.

2005

Hurricane Katrina strikes the U.S. Gulf Coast. EMRA collected textbooks for residents and medical students to replace those lost at LSU and Tulane University.

2013

EMRA debuted the landmark documentary, *24/7/365 – The Evolution of Emergency Medicine*. The film tells the story of the specialty's maverick founders.

2016-PRESENT

Multiple on-shift guides and publications are published including EMRA's *EM Fundamentals*, *EKG Guide*, and *EMRA and ACMT Medical Toxicology Guide*. Membership exceeds 15,000 and EMRA now funds 111 leadership positions.





ACEP18 HIGHLIGHTS

↑ Each October, EMRA sends seasoned leaders out into the world and welcomes newly elected residents ready to guide the association. This year we thank outgoing board members (from left) **Rachel Solnick, MD**; **Shehni Nadeem, MD**; **Geoff Comp, DO, FAWM**; **Scott Pasichow, MD, MPH**; **Nida Degesys, MD**; and **Alicia Kurtz, MD**.

→ The 2018-2019 EMRA Board of Directors includes President **Omar Maniya, MD, MBA**; Past President **Zach Jarou, MD**; President-elect **Hannah Hughes, MD, MBA**; Director of Membership **Greg Tanquary, DO, MBA**; Vice Speaker **Karina Sanchez, MD**; Director of Education **Sara Paradise, MD**; Director of Health Policy **Angela Cai, MD, MBA**; Medical Student Council Chair **Sarah Ring**; Secretary/EM Resident Editor **Tommy Eales, DO**; Director of Technology **Nick Salerno, MD**; ACGME RC-EM Representative **Eric McDonald, MD**; Resident Representative to ACEP **Erik Blutinger, MD, MSc**; and Speaker **Nathan Vafaie, MD, MBA**.



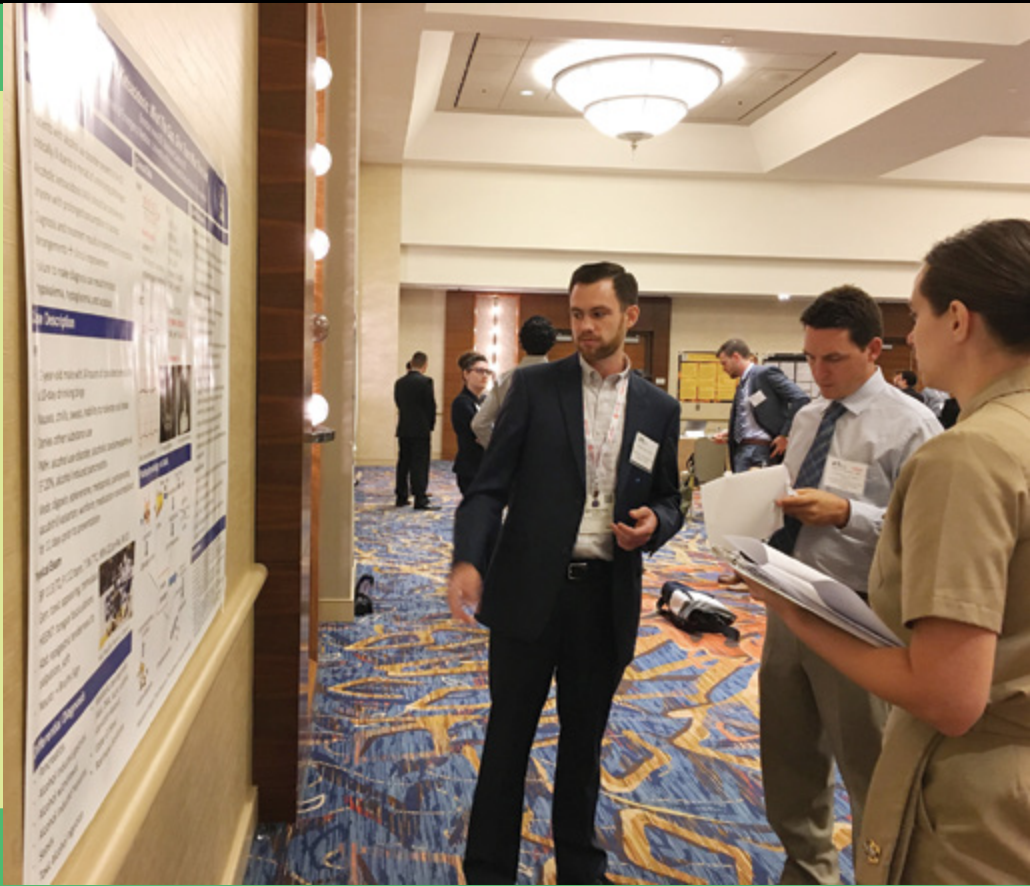


BEST LECTURERS IN ALL THE LAND

The EMRA 20 in 6 Resident Lecture Competition, sponsored by Hippo, raised the bar for residents, with engaging presentations from a field of fierce competitors. Congrats to our winners (front row, from left) **Carolyn Comissaris**, MD, from the University of Michigan: 3rd place for “You’re Not Dead Until You’re Cold and Dead: Management of Cardiac Arrest Due to Hypothermia”; **Jon Smart**, MD, from UT Health San Antonio: 1st place for “Right Heart on Fire: Pulmonary Hypertension”; and **Katie Lupez**, MD, from Carolinas Medical Center: 2nd place for “Human Jetpacks.” Many thanks to our hosts and celebrity judges (back row, from left) EMRA Education Committee Chair-Elect **Thomas Yang**, MD; judges **Rob Orman**, MD; **Mizuho Spangler**, DO; **Allen Chang**, MD; **Michael Gisondi**, MD; and Education Committee Chair **Deena Khamees**, MD.

CONQUERING CASE-CON

The Research Committee hosted its inaugural Case-Con in 2018, selecting 20 medical students to present case studies to a national audience. Congratulations to winners **Parth S. Gandhi** of Broward Health Medical Center: 1st place for “Lost in the Forest: A Rare Case of Forestier’s Disease”; **Alex Gregory** of St. Louis University: 2nd place for “Eggs Marks the Spot: The Diagnostic Dilemma of In Vitro Fertilization-Associated Emergencies”; and **Brendan Innes** of the University of Massachusetts: 3rd place for “Alcoholic Ketoacidosis: Mind the Gap and Give Patients What They Need.”



EMRA•Cast

As EMRA funds education and professional development for 5 new podcast hosts, the podcasting community has welcomed the newcomers with open arms — and mentorship. EM:RAP, EM Over Easy, Front Line, and more have stepped up to offer tips, tricks, and knowledge.

MEDWAR MAJESTY

EMRA's 3rd annual MedWAR made great use of Cuyamaca Rancho State Park, putting competitors through their paces as they practiced wilderness medicine. **Team Major Monteggia and the Tense Compartments from Madigan Army Medical Center** won first place, followed by defending champions **MCG Emergency Medicine** in second place and **RocEM SockEM/University of Rochester** in third. Many thanks to faculty advisors (and wilderness medicine experts) **Michael Caudell, MD, FACEP**; **Taylor Haston, DO**; and **Hillary Irons, MD, PhD, FACEP**; and race medical director **Michael Lindsey, MD**. Special recognition goes to sponsors BTG, Gaumard, and Hydralyte.





EMRA FAIRS

The EMRA Residency Program Fair and the EMRA Job & Fellowship Fair bring thousands of hopeful medical students and job-seekers face-to-face with residency leaders and employers from across the country.



MEDICAL STUDENT FORUM

The annual EMRA Medical Student Forum offers valuable advice from program leaders just in time for the start of interview season.



Congratulations

PLEASE JOIN EMRA IN CONGRATULATING OUR AWARD WINNERS.

2018 EMRA AWARD WINNERS

ACEP18 TRAVEL SCHOLARSHIPS

Tiffany Abramson, MD, LAC+USC EMS Fellowship
Marielle Brenner, MD, Medical College of Wisconsin
Allen Chang, MD, Stanford University Medical Center/Kaiser Permanente Medical Center
Shih-chuan Chou, MD, Brigham and Women's Hospital
Ryan DesCamp, Indiana University School of Medicine
Lauren East, Medical College of Georgia
Moudi Hubeishy, State University - New York Buffalo Medical School
Brendan Innes, University of Massachusetts Medical School
Emil Klosowiak, University of Illinois - Chicago
Jonathan Meadows, DO, Merit Health Wesley

ACEP18 TRAVEL SCHOLARSHIPS - SPONSORED BY EVIDENCE CARE

Mustafa Alam, Howard University
Nicole McAmis, Frank H. Netter MD School of Medicine at Quinnipiac University

CORD ACADEMIC ASSEMBLY TRAVEL SCHOLARSHIPS

Miguel Arribas, MD, University of Michigan
Erich Heine, DO, Orlando Health Residency Program Alumni
Kayvon Izadpanah, MD, University of Virginia Health System
Corlin Jewell, MD, University of Wisconsin
Megha Rajpal, MD, The Mount Sinai School of Medicine - New York
Peter Tomaselli, MD, Thomas Jefferson University

EDDA (EMERGENCY DEPARTMENT DIRECTORS ACADEMY) TRAVEL SCHOLARSHIPS

Timothy Boardman, MD, Brown University
Dana Im, MD, The Brigham and Women's/Massachusetts General Hospital Harvard Affiliated
Emergency Medicine - Residency
Kian Preston-Suni, MD, Harbor-UCLA Medical Center
Daniel Sternberg, MD, Albert Einstein College of Medicine-Montefiore
Hisham Valiuddin, DO, St. Mary Mercy Hospital

EDPMA (EMERGENCY DEPARTMENT PRACTICE MANAGEMENT ASSOCIATION) TRAVEL SCHOLARSHIP

Maureen Canellas, MD, University of Chicago

LAC TRAVEL SCHOLARSHIPS

Farah Dadabhoj, MD, The Brigham and Women's/Massachusetts General Hospital Harvard
Affiliated Emergency Medicine Residency
Corey McNeilly, University of Texas School of Medicine at San Antonio

FEMINEM FIX18 TRAVEL SCHOLARSHIPS

Hannah Hughes, MD, MBA, University of Cincinnati College of Medicine
Ynhi Thomas, MD, Baylor College of Medicine

INTERNATIONAL EM CONFERENCE SCHOLARSHIP

Emily Chien, MD, State University of New York - Downstate/Kings County Hospital

INTERNATIONAL EM ROTATION SCHOLARSHIP

Kathryn Lupez, MD, Carolinas Medical Center

MEDICAL STUDENT HEALTH POLICY ELECTIVE

Cara Buchanan, George Washington University School of Medicine and Health Sciences

RESIDENT/FELLOW HEALTH POLICY ELECTIVE

Cameron Gettel, MD, Brown University

CONGRESSIONAL HEALTH POLICY FELLOWSHIP IN WASHINGTON, DC

Aakash Shah, MD, MBA, Rutgers Robert Wood Johnson Medical School

SIMULATION RESEARCH GRANTS

Jana Florian/Kyle Schoppel, MD, Boston University School of Medicine/Boston Medical Center

BE THE CHANGE PROJECT GRANT

Cindy Chang, MD, Harbor-UCLA Medical Center

FOAM(ER) OF THE YEAR AWARD

Ben Duncan, DO, University of Michigan

STEVE TANTAMA, MD MILITARY EXCELLENCE AWARD

CPT Daniel Holleyman, MD, University of Arkansas

CLINICAL EXCELLENCE AWARD

Christopher Hebert, MD, University of Michigan
Robert Klemisch, MD, Denver Health

AUGUSTINE D'ORTA HUMANISM AWARD

Hannah Janeway, MD, Los Angeles County - Harbor-UCLA Medical Center

FACULTY TEACHING EXCELLENCE AWARD

Ryan Pedigo, MD, Harbor-UCLA Medical Center

FACULTY MENTOR OF THE YEAR AWARD

Christine Babcock, MD, FACEP, University of Chicago
Gita Pensa, MD, Brown University

JOSEPH F. WAECKERLE ALUMNI OF THE YEAR AWARD

Rebecca B. Parker, MD, FACEP, Envision Physician Services



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Spring Awards

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Critical Care Medicine Conference
Scholarship
Academic Excellence Award
ACEP Scientific Review Subcommittee
Appointment
Dr. Alexandra Greene Medical Student(s)
of the Year Award
EMRA Congressional Health Policy
Fellowship in Washington, DC
Jean Hollister Contribution to
Pre-Hospital Care Award
Fellow of the Year Award
EMRA Resident of the Year
Rosh Review "One Step Forward" Award
EDDA (Emergency Department Director's
Academy) Travel Scholarship
EMBRS (Emergency Medicine Basic
Research Skills) Scholarship
ACEP Teaching Fellowship Scholarship
Be the Change Project Grant
Residency Director of the Year
Residency Coordinator of the Year
Associate Residency Director of the Year
Chief Resident(s) of the Year



www.emra.org

Applications due

January 15, 2019

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BE INVOLVED

*Presentation of awards will occur at
ACEP Scientific Assembly 2019*

ECG Challenge

Andrew Staffaroni, MD

Christiana Care Health System
@adstaffaroni

Mahesh Polavarapu, MD

Christiana Care Health System
@mpolavarapu

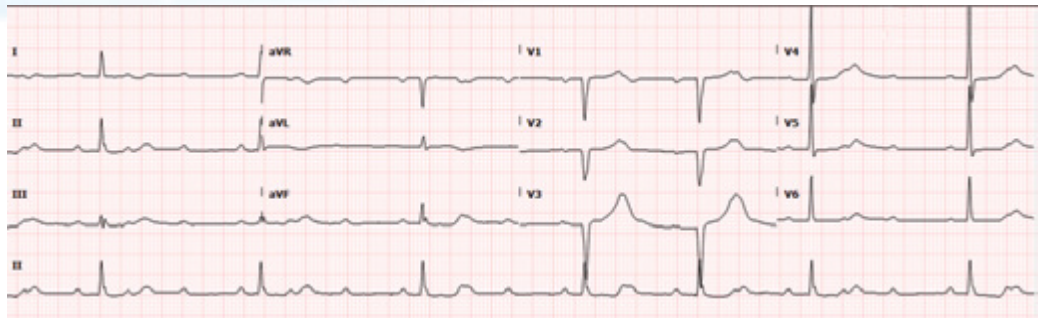
Jeremy Berberian, MD

Associate Director of Resident Education,
Dept. of Emergency Medicine
Christiana Care Health System
@jgberberian

CASE.

A 72-year-old female presents with exertional syncope for the past several days.

What is your interpretation of her EKG?



See the ANSWER on page 48

R. Steven Stefancic, MD

University of Virginia
@StevenStefancic

Visual Diagnosis

A male in his mid-40s presents with sore throat, difficulty breathing, vocal change, and drooling. He appears anxious and uncomfortable; initial vitals show a febrile, tachycardic patient. Upon exam he is reluctant to rotate his neck, has difficulty speaking and swallowing, and repeatedly needs to wipe away excess drool. Visual inspection shows a normal-appearing pharynx; pulmonary exam reveals bilateral rhonchi.

He reports receiving all regular vaccinations, has no history of severe allergic reactions or angioedema, and has no inciting event. His past medical history reveals nothing significant for difficulty breathing or airway pathology. He does not take any ACE inhibitors or other medications that can cause airway swelling.

What's the Diagnosis?

See the ANSWER on page 49



ECG Challenge



ANSWER

High Degree AV Blocks

This ECG shows an irregular narrow complex bradycardia with a ventricular rate of ~40 bpm and a PR interval for the conducted P-waves is ~200 ms. The pattern of P waves and QRS complexes demonstrates a 3:1 AV block (QRS complexes 1, 2, 3, and 5) and a 2:1 AV block (QRS complexes 4 and 5). When interpreting an ECG with a 2:1 AV block, the absence of 2 consecutive conducted P waves makes it impossible to determine if the PR interval is lengthening or not. Since there is not enough information to determine if the underlying rhythm is a Mobitz I or Mobitz II, it is best to assume the higher risk Type II pathology. Note that while a wide QRS suggests a Mobitz Type II, a narrow QRS can be seen with both Type I and Type II. This ECG also shows a 3:1 AV block, which similarly to the 2:1 AV block, lacks 2 consecutive conducted P waves. 2nd degree AV blocks with ≥ 2 consecutive non-conducted P waves are called “high-grade” or “advanced” and are considered a variant of Mobitz Type II.

Image 2 shows a 4:1 AV block (there is a P wave buried in the T wave) with a ventricular rate of ~30 bpm and a RBBB with repolarization abnormalities in the right precordial leads. There are also STD in the inferior and lateral precordial leads of unclear etiology. Note that a RBBB will usually have STD and TWI in the right precordial leads, but only in leads that have a R'-wave. And unlike with a LBBB, the repolarization abnormalities associated with RBBB's do not include STE. Although the changes seen in this ECG were not due to ischemia, it important to recognize that high-grade blocks, especially when there is a concurrent RBBB, are at high risk for decompensating into 3rd degree AV blocks and generally portend a poor prognosis when associated with anterior or anteroseptal MI's.



LEARNING POINTS

High-grade or Advanced 2nd Degree AV Block

GENERAL FEATURES

- Variant of Mobitz Type II where ≥ 2 sequential P waves are not conducted

EKG FEATURES

- ≥ 2 sequential P waves are not conducted
- Relatively constant PP interval
- Constant PR interval in conducted beats
- Described as ratio of P waves to QRS complexes
- QRS can be wide or narrow

CLINICAL SIGNIFICANCE

- Atropine is unlikely to lead to clinical improvement
- High risk of progression to 3rd degree AV block when associated with anterior or anteroseptal AMI

Right Bundle Branch Block (RBBB)

GENERAL FEATURES

- Delayed conduction through right ventricle with normal left ventricular conduction

EKG FEATURES

- QRS ≥ 120 ms
- Rsr', rsR', or rSR' in V1 or V2

- S-wave duration $>$ R-wave or $>$ 40 ms in I and V6
- Normal R-wave peak time in V5 and V6 but $>$ 50 ms in V1 (only required if a pure dominant R-wave +/- notch is present in V1)

CLINICAL SIGNIFICANCE

- Does not confound EKG evaluation of ACS (unlike LBBB)
- Repolarization abnormalities include ST depressions and T-wave inversions in V1-V3 \Rightarrow ischemia not easily determined in these leads
- The presence of axis deviation \Rightarrow evaluate for concurrent LAFB or LPFB

Case Conclusion

The patient's workup in the ED, which included labs, troponins, and POCUS echocardiogram, was unremarkable. The patient was admitted to the Cardiology service for pacemaker placement and discharged after an uneventful hospital course.

Assessment

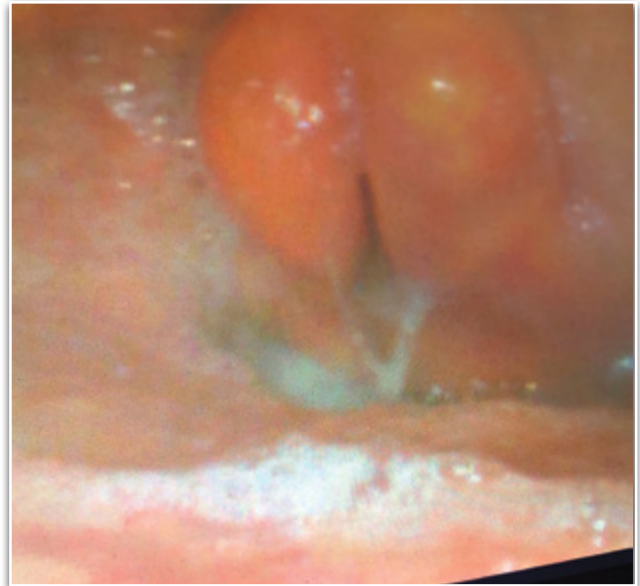
Epiglottitis

Airway edema is always concerning, and epiglottitis was near the top of the differential in this case within seconds of observing the patient. IV steroids, fluids, glycopyrrolate, racemic epinephrine, antibiotics, and radiographs of the chest and neck were all quickly ordered while paging ENT and anesthesia.

Upon visualizing the area around the vallecula with a nasopharyngeal scope, the epiglottis was found to be significantly inflamed and edematous, with no larynx visualized. During exhalation, there was a very thin, black slit being the only space for air to flow. During inhalation, this black slit disappeared.

With the confirmation of epiglottitis, the patient was taken emergently to the OR for an awake fiberoptic nasotracheal intubation. He was discharged days later and achieved full recovery.

Epiglottitis is a relatively rare but potentially life-threatening condition associated with infection or injury. It constitutes a true medical emergency and should remain high on your differential when patients present with the hallmark symptoms of difficulty breathing/swallowing/speaking, excessive drooling, sore throat, fever, and slight relief when leaning forward.



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Board Review Questions



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

Order PEER at acep.org/peer.

1. A 52-year-old man is brought in by ambulance after 24 hours of right lower quadrant abdominal pain and fever. Vital signs include BP 85/45 (MAP 58), P 135, R 27, T 38.5°C (101.3°F); weight is 70 kg. While pursuing further diagnostic evaluation, treatment, and surgical evaluation for appendicitis, resuscitation is initiated. His blood pressure does not improve significantly with an additional 2 L of normal saline; lactate remains elevated at 4.6 mg/dL, and urine output is negligible. What is the best next step in management?
 - A. Administer stress-dose intravenous steroids and continue aggressive fluid resuscitation
 - B. Begin dopamine continuous infusion
 - C. Begin norepinephrine continuous infusion
 - D. Continue aggressive fluid resuscitation with repeat boluses
2. Which of the following findings is most consistent with a high likelihood of acute coronary ischemia?
 - A. Coronary artery disease risk factors
 - B. Presence of diaphoresis
 - C. Recent cocaine use
 - D. T-wave flattening on ECG
3. Which of the following factors predicts the highest risk for sudden death in an adult asthma patient?
 - A. History of smoking
 - B. Increased use of beta agonists
 - C. Inhaled corticosteroid use
 - D. Self-reported symptom severity
4. Which of the following findings is most consistent with cyanide poisoning?
 - A. Ketoacidosis
 - B. Lactic acidosis
 - C. Low venous oxygen saturation
 - D. Reddish plasma discoloration
5. A 21-year-old man presents with a painful, red, swollen ear 12 hours after being assaulted. What is the appropriate treatment?
 - A. Ice 20 minutes on and 20 minutes off and NSAIDs for pain
 - B. Incision and drainage and suturing of cotton pledgets to the pinna
 - C. Intravenous administration of broad-spectrum antibiotics
 - D. Placement of a cotton ear wick in the external auditory canal ★

ANSWERS
1. C; 2. B; 3. B; 4. B; 5. B

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CALIFORNIA

Ventura — New hospital under construction and scheduled to open in the spring of 2018 with a state-of-the-art Emergency Department. Practice with a stable ER group on the central coast of California and only 70 miles from LAX. Positions available in two facilities for BC/BE emergency physician. Main facility is a STEMI Center, Stroke Center with on-call coverage of all specialties. This is a teaching facility with residents in Family Practice, Surgery, Orthopedics and Internal Medicine. Admitting hospital teams for Medicine and Pediatrics. 24-hour OB coverage in house and a well-established NICU. Annual volume is 48K patients with nearly 70 hours of coverage daily and 12 hours of PA/NP coverage. All shifts and providers have scribe services 24/7. Affiliated hospital is a smaller rural facility 20 minutes from Ventura in Ojai. Malpractice and tail coverage is provided. New hires will work days, nights, weekends and weekdays. Come work with a well-established high caliber group with expected volume growth potential at our new facility. Enjoy the life style of a beach community yet outside the hustle of the LA area. Please send a resume to Alex Kowblansky, MD, FACEP, at kowblansky@cox.net.

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If you are interested in learning more about this opportunity, or would like to apply, please contact: Dave Rezendes, Senior Physician Recruitment Specialist, Steward Health Care at 781-551-5640 or email: david.rezendes@steward.org.

All inquiries will remain confidential. Steward Health Care is an equal opportunity/affirmative action employer.

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INDIANA

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MASSACHUSETTS

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Complete descriptions of all programs, application instructions, and Fellowship Director contacts can be found at:

<https://smhs.gwu.edu/emed/education-training/fellowships>



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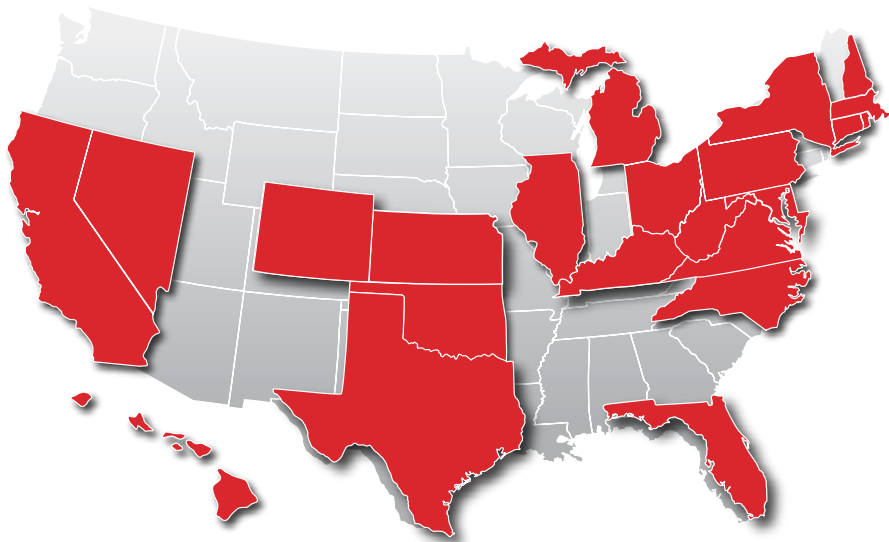
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- Attractive year-end incentive bonus
- Comprehensive benefits package
- 401K and deferred compensation
- And more!

Steward Health Care, the largest private hospital operator in the United States, is a physician-led health care services organization committed to providing the highest quality of care in the communities where patients live. Steward operates 39 community hospitals in the United States and the country of Malta, that regularly receive top awards for quality and safety. For additional information, please contact: Catrina Morgan, Physician Recruitment Specialist, E: Catrina.Morgan@Steward.org P: 781-551-5629.

OHIO

EMERGENCY MEDICINE PHYSICIANS BC/BE

Full-time, Part-time or Per diem Needed in Northeast OH

Trumbull Regional Medical Center, a Steward Family teaching Hospital, is currently seeking a BC/BE Emergency Medicine Physician with excellent clinical acumen, strong interpersonal skills, and a commitment to providing outstanding patient centered care. We are also looking for a leadership candidate to assist the current ED Chair. The ED is a Level 3 trauma center averaging approximately 32,000 patients annually treating a full range of acuity. Our department is staffed by 15 dedicated EM physicians and seasoned advanced practitioners, along with a newly established IM/ FM residency. Benefits of joining our physician-governed EM group include:

- Competitive Salary
- Comprehensive benefits package
- Attractive year-end incentive bonus
- Attractive CME/professional reimbursement
- 401K and deferred compensation
- Transparent financial monthly statements
- Tuition reimbursement
- Full-time, Part-Time and Per Diem Physicians Needed

Conveniently located 1 hour between Pittsburgh and Cleveland, Trumbull Regional Medical Center, a 346 bed facility in Northeastern Ohio, serves the health care needs of residents of Trumbull County and nearby communities, and has been providing quality care for over a century. The hospital has residents in IM and Family Medicine and is the first in Ohio to achieve Chest Pain v5 accreditation, which is the highest level accreditation from the Society of Cardiovascular Patient Care. Steward Health Care, the largest private hospital operator in the U.S., is a physician-led health care services organization committed to providing the highest quality of care in the communities where patients live. Steward operates 38 community hospitals nationwide that employ approximately 37,000 people and regularly receive top awards for quality and safety. The Steward network includes more than 26 urgent care centers, 42 preferred skilled nursing facilities, substantial behavioral health services, over 7,300 beds under management, and more than 1.1 million covered lives through the company's managed care and health insurance services. Steward's unique health care service delivery model leverages technology,



Actively Recruiting:

BC/BE Emergency Physician

- Democratic, Physician-Owned Group
- 50,000 Annual Volume Community Hospital
- Dedicated Night Physicians & MLP Staff
- Medical, Dental, 401K, Disability, CME
- Generous Compensation
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- Annual Profit Sharing
- Partnership Track (No Buy-In)
- Value Work/Life Balance



Contact: Myles Jen Kin, DO FAAEM

Wachusett Emergency Physicians
60 Hospital Road, Leominster, MA 01453
Call: (978) 660-9221 Email: mjenkin@wepdocs.com

Emergency medicine physician opportunities at Geisinger

Geisinger, a national leader in healthcare innovation and technology, is seeking BC/BE Emergency Medicine trained physicians for opportunities throughout central, south central and northeast Pennsylvania.

Join Geisinger's growing team of Emergency Medicine staff physicians in practicing state-of-the-art medicine in one, or a variety of settings.

With Geisinger, you can take advantage of:

- Competitive compensation package
- Exceptional work life balance, defined clinical hours
- Support from a full range of dedicated specialists and subspecialists
- Scribes, pharmacists and Advance Practice support
- Ongoing enhancements to our fully-integrated Electronic Health Record (EHR) – Epic
- \$150,000 medical school loan repayment
- \$100,000 forgivable loan
- \$2,000 monthly stipend available to current residents upon signature of an offer letter

Locations throughout PA include:

- Geisinger Bloomsburg Hospital (GBH)
Bloomsburg
- Geisinger Wyoming Valley Medical Center (GWV)
Wilkes-Barre
- Geisinger South Wilkes-Barre (GSWB)
Wilkes-Barre
- Geisinger Holy Spirit (GHS)
Camp Hill
- Geisinger Shamokin Area Community Hospital (GSACH)
Coal Township

Geisinger is nationally recognized for our innovative practices and quality care.

A mature electronic health record connects a comprehensive network of 13 hospital campuses, two research centers and nearly 1,600 Geisinger primary and specialty care physicians.

For more information, visit geisinger.org/careers or contact Miranda Grace, Talent Management, at 717-899-0131 or mgrace@geisinger.edu

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Academic Emergency Physician Rutgers New Jersey Medical School, Newark, NJ

The Department of Emergency Medicine at Rutgers New Jersey Medical School in Newark, NJ, is recruiting highly qualified, full-time BC/BE Emergency Medicine Faculty at the Assistant or Associate Professor level.

Join a diverse, enthusiastic faculty of academic Emergency Physicians in an expanding and dynamic department committed to scholarship, education, research, and outstanding clinical care. Clinical services are provided at University Hospital in Newark, NJ, a Level I trauma center.

Optimal candidates will have a desire for clinical, academic, or administrative excellence. Subspecialty of other training desired, but anyone with clinical and academic aspirations is strongly encouraged to begin or enhance your career at Rutgers NJMS. The salaries are competitive, the institutions and leadership are very supportive, and the patient population is highly in need of quality healthcare.

Live nearby in beautiful suburban or urban New Jersey or within a short commute from New York City. The medical school is blocks from the New Jersey Institute of Technology and the Rutgers Newark Campus, as well as the rejuvenating downtown Newark area, and is close to Newark Liberty Airport and Newark Penn Station Amtrak.

For more information or to submit a CV/cover letter please contact:

Lewis S. Nelson, MD
Chair, Department of Emergency Medicine
185 South Orange Avenue, MSB 609
Newark, NJ 07103 E-609
Email: Lewis.Nelson@njms.rutgers.edu

Rutgers University is an AA/EEO employer. All applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, citizenship, disability or protected veteran status.

CLASSIFIED ADVERTISING

innovation, and care coordination to keep patients healthier. With a culture that prioritizes agility, resourcefulness, and continuous improvement, Steward is recognized as one of the nation's leading accountable care organizations. The Steward Health Care Network includes thousands of physicians who care for approximately 2 million patients annually. Steward Medical Group, the company's employed physician group, provides more than 1 million patient encounters per year. The Steward Hospital Group operates hospitals in Arizona, Arkansas, Colorado, Florida, Louisiana, Massachusetts, Ohio, Pennsylvania, Texas, Utah and the country of Malta.

If you are interested in learning more about this opportunity, or would like to apply, please contact: Dave Rezendes, Senior Physician Recruitment Specialist, Steward Health Care at 781-551-5640 or email: david.rezendes@steward.org. All inquiries will remain confidential. Steward Health Care is an equal opportunity/affirmative action employer.

OREGON

Salem — Outstanding BC/BE EM physician partnership opportunity at Salem Health Emergency Department (SEPS). Well-established, independent, democratic group with 37 physicians and 6 APPs who staff 110K annual visit, Level II trauma center, with excellent specialty backup. Competitive pay and benefits including scribes, flexible scheduling, malpractice, 401k, and more. We structure our practice to minimize turnover through maximizing work-life balance. We love living in Salem, the heart of Oregon wine country, as it is convenient to the bounty of Oregon's recreational opportunities, and is a safe and affordable community. See what we're about at sepspc.com, then send your CV, cover letter, and a recent photo to sepspc@salemhealth.org or call us at 503-814-1278.

TEXAS



Leading Edge Medical Associates is a one-of-a-kind, private, independent group of all board-certified EM physicians in northeast Texas, offering a full range of clinical opportunities in EM. Our physicians enjoy shifts in a tertiary care trauma center as well as in nearby, lower volume clinical settings, all with high compensation and excellent full benefits. We are known for innovation in the industry and for developing strong EM leaders through LEMA's Leadership Development Institute. Almost half our physicians are former chief residents. LEMA is unique in its ability to offer physicians the best of both worlds, hospital-based and freestanding, academic and community medicine. LEMA is a group of exemplary physicians who work together as a team, value each member's input, and have a level of integrity, honesty, and trust that makes this innovative group truly one-of-a-kind. Interested in joining Texas's premier private group? Contact: [SUZYMEEK, MD, CAREERS@LEMA-EM.COM](mailto:SUZYMEEK@LEMA-EM.COM).

WESTERN PENNSYLVANIA

EMERGENCY MEDICINE UPMC and University of Pittsburgh

UPMC has a long history of emergency medicine excellence, with a deep and diverse EM faculty also a part of the University of Pittsburgh. We are internationally recognized for superiority in research, teaching and clinical care. With a large integrated insurance division and over 25 hospitals in Pennsylvania and growing, UPMC is one of the nation's leading health care systems. We do what others dream - cutting edge emergency care inside a thriving top-tier academic health system.

We can match opportunities with growth in pure clinical or mixed careers with teaching, research, and administration/ leadership in all settings - urban, suburban and rural, with both community and teaching hospitals. Our outstanding compensation and benefits package includes malpractice without the need for tail coverage, and employer-funded retirement plan, generous CME allowance and more.

To discuss joining our large and successful physician group, email emcareers@upmc.edu or call 412-432-7400.



EOE Minority/Female/Vet/Disabled

72714C HR&SE 02/17

{ Job Opportunities }

Division Chief, Pediatric Emergency Medicine
EMS Fellowship Director/EMS Medical Director
Assistant Medical Director
PEM/EM Core Faculty
Vice Chair Research Emergency Medicine

What We're Offering:

- We'll foster your passion for patient care and cultivate a collaborative environment rich with diversity
- Salaries commensurate with qualifications
- Sign-on bonus
- Relocation assistance
- Retirement options
- Penn State University Tuition Discount
- On-campus fitness center, daycare, credit union, and so much more!

What We're Seeking:

- Experienced leaders with a passion to inspire a team
- Ability to work collaboratively within diverse academic and clinical environments
- Demonstrate a spark for innovation and research opportunities for Department
- Completion of an accredited Emergency Medicine Residency Program
- BE/BC by ABEM or ABOEM
- Observation experience is a plus

What the Area Offers:

We welcome you to a community that emulates the values Milton Hershey instilled in a town that holds his name. Located in a safe family-friendly setting, Hershey, PA, our local neighborhoods boast a reasonable cost of living whether you prefer a more suburban setting or thriving city rich in theater, arts, and culture. Known as the home of the Hershey chocolate bar, Hershey's community is rich in history and offers an abundant range of outdoor activities, arts, and diverse experiences. We're conveniently located within a short distance to major cities such as Philadelphia, Pittsburgh, NYC, Baltimore, and Washington DC.



FOR ADDITIONAL INFORMATION PLEASE CONTACT:



Susan B. Promes, Professor and Chair, Department of Emergency Medicine c/o Heather Peffley,
Physician Recruiter, Penn State Health Milton S. Hershey Medical Center
500 University Drive, MC A595, P O Box 855, Hershey PA 17033
Email: hpeffley@pennstatehealth.psu.edu
or apply online at: hmc.pennstatehealth.org/careers/physicians

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NORTH SHORE MEDICAL CENTER

EMERGENCY MEDICINE OPPORTUNITY NEAR BOSTON, MA

ONE TEAM.
ONE FOCUS.

One thing sets North Shore Medical Center apart—our team based model of care which is founded on the principle that physicians, nurses, and other care providers working together will provide higher quality and a better patient experience. Today, that team focus drives our providers to be leaders of quality of care, patient safety and process improvement initiatives throughout NSMC.

While practicing as an Emergency Medicine physician at NSMC you will enjoy:

- working at one of the top hospitals in Boston with a new Emergency Department opening in October 2019
- the benefits of NSMC's membership in the Partners Healthcare System, founded by Massachusetts General Hospital and Brigham and Women's Hospital
- our combined annual adult ED volume of 80,000 visits provides an array of pathology with a fast track and PA program in place and excellent multispecialty back up
- a culture focused on communication, growth, and work/life balance
- excellent compensation and comprehensive fringe benefits
- being an active contributor to quality of care, patient safety and process improvement initiatives

Let's work together.

Interested candidates should send their CV to: Louis Caligiuri, Director of Physician Services at lcaligiuri@partners.org

EMERGENCY PHYSICIANS

of St. Petersburg, PA



Located in St. Petersburg, Florida
Seeking Fulltime BC/BE Emergency Physicians
at a Level II Trauma Center with 48,000 volume.

We are a rapidly expanding, well-established, independent, democratic group.

Bayfront Health broke ground for a new 37,000 sq ft state-of-the-art Emergency Department.

480-bed hospital with:

- Primary Stroke Center
- Chest Pain Center with PCI
- Level IV Epilepsy Center
- Aero-Medical Flight Program
- Regional Flagship hospital with a network of six hospitals along the Florida Gulf Coast
- 48-hour physician coverage
- 36-hour PA/ARNP coverage

A free-standing ED is also slated to open November 1, 2018.

We offer a comprehensive benefit package including health, dental, vision, LTC, CME allowance, 401K, profit-sharing, along with a partnership track.

Requirements: residency trained, ACLS, ATLS and PALS certified.

For more information, contact
the Emergency Physicians of St. Petersburg, PA at
(727)-553-7300, fax (727)-553-7395
or email: aaeps360@gmail.com
Our web site is EpspBayfront.com

CoxHealth opportunity

BE/BC emergency medicine

- Newly renovated eight-bed emergency department.
- More than 14,000 patients annually.
- Schedule is 12, 12-hour shifts a month.
- Competitive salary and sign-on bonus.
- Cox Monett Hospital named one of Modern Healthcare's 150 Best Places to Work in Healthcare



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Exciting Emergency Medicine Opportunities with Steward Health Care!

STEWARD HEALTH CARE, the largest private hospital operator in the United States, is a physician-led health care services organization committed to providing the highest quality of care in the communities where patients live.

EXPLORE THE EXCITING OPPORTUNITIES AT OUR NUMEROUS HOSPITALS:

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Melbourne Regional Medical Center, Melbourne, FL
 Rockledge Regional Medical Center, Rockledge, FL
 Sebastian River Medical Center, Sebastian, FL

MASSACHUSETTS

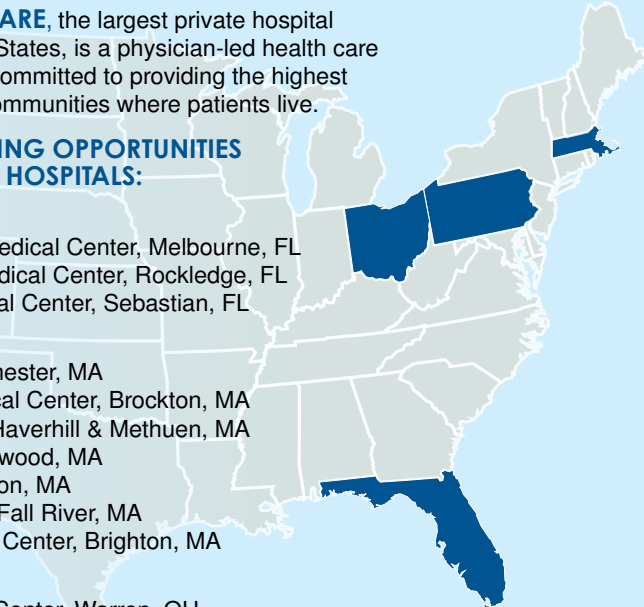
Carney Hospital, Dorchester, MA
 Good Samaritan Medical Center, Brockton, MA
 Holy Family Hospital, Haverhill & Methuen, MA
 Norwood Hospital, Norwood, MA
 Morton Hospital, Taunton, MA
 Saint Anne's Hospital, Fall River, MA
 St. Elizabeth's Medical Center, Brighton, MA

OHIO

Hillside Rehabilitation Center, Warren, OH
 Trumbull Regional Medical Center, Warren, OH

PENNSYLVANIA

Easton Hospital, Easton, PA
 Sharon Regional Medical Center, Sharon, PA



Our Emergency Medicine departments offer excellent support staff, EMR, midlevel coverage, scribes, flexible scheduling, and more.

- Newly constructed state-of-the-art EDs
- Multiple Teaching Hospitals
- Highly competitive compensation and benefits packages
- Productivity based incentive programs
- Sign On Bonus for select locations
- Part of a large national network of Hospitals and Physicians

For more information please contact:
Catrina Morgan | Physician Recruitment Specialist
Network Development | Steward Health Care
O:781-551-5629 | C:781-635-9703
Email: Catrina.Morgan@Steward.org

Steward



Contact us at
recruitment@umem.org
 or 410-328-8025

UMEM is an EOE/AEE



UNIVERSITY of MARYLAND EMERGENCY MEDICINE

Academic and Community Openings for BE/BC Emergency Physicians

Vibrant and varied career possibilities in academic and community settings in the Baltimore metropolitan area as well as near Washington, Philadelphia and Maryland's coastline.

Live and work in an urban, suburban or rural community, in an atmosphere that encourages work/life balance.

Current EM Practice Opportunities

- Downtown Baltimore – Volumes from 21 to 66K**
- North of Baltimore – Volumes from 32 to 65K**
- Eastern Shore – Volumes from 15 to 37K**
- DC Suburbs – Volumes from 34 to 60K**

Our supportive team approach in the delivery of high quality patient care features:

- Dedicated fast track and intake units staffed by Family Practice physicians and PAs
 - ED scribes and medical information systems
 - Stoke centers & STEMI programs
- Ultrasound programs with bedside US machines
- Advanced airway equipment including GlideScope®

Generous Compensation and Benefit Package

- Additional incentive compensation
- Medical, dental, vision and life insurance
- Employer-paid CME, PTO and 401K safe harbor retirement plan
- Employer-paid malpractice insurance with full tail coverage



BOSTON EMERGENCY MEDICINE OPPORTUNITY

The Department of Emergency Medicine at Tufts Medical Center, the principal teaching hospital for Tufts University School of Medicine in Boston, is seeking an ABEM/AOBEM BP/BC Emergency Physician to join our dynamic, independent group of residency trained, board certified emergency physicians. The Department currently offers a variety of clinical and educational programs with emphasis on resident and medical student education. Research opportunities within the Tufts Clinical and Translational Science Institute abound. Personal growth is guaranteed.

At Tufts Medical Center you will experience the following:

- ACS Level I Pediatric and Adult Trauma Center
- JC Accredited Comprehensive Stroke Center
- Dedicated Pediatric Emergency Department
- Volume of 50,000 diverse patients/year
- Outstanding Pediatric, EMS, Ultrasound and Geriatric Programs
- Students and Residents who will stimulate you
- Colleagues and Nursing Staff who you will enjoy working with side by side
- An excellent compensation package

Please contact or forward CV to:
Brien A. Barnewolt, M.D., F.A.C.E.P.
 Phone: 617-636-4721
 Email: bbarnewolt@tuftsmedicalcenter.org



EMSOC, Emergency Medicine Specialists of Orange County

Hiring both Emergency and Pediatric Emergency Physicians Partnership Track Available

Ideal Emergency Medicine physician candidates are those boarded in emergency medicine or board eligible in emergency medicine working interested in an academic emergency medicine environment at CHOC Children's Hospital of Orange County.

Ideal Pediatric Emergency Medicine physician candidates are those boarded in pediatric emergency medicine or board eligible in pediatric emergency medicine working interested in an academic emergency medicine environment at CHOC Children's Hospital of Orange County.

CHOC Children's Hospital of Orange County is a newly opened ultramodern emergency department of 35 beds with Level II trauma center designation, rapid assessment and treatment area, fellowship and resident involvement. Additionally, all emergency physicians are supported with medical scribes and mid-level providers.

EMSOC and CHOC Children's Hospital of Orange County are nationally recognized for teaching excellence in an independent democratic practice environment.

Contact Information Contact EMSOC@emsoc.net for applications and additional information, or call 714-543-8911.

THE GEORGE WASHINGTON UNIVERSITY

Faculty Positions-Emergency Medicine

The George Washington University Medical Faculty Associates, an independent non-profit academic clinical practice group affiliated with The George Washington University, is seeking full-time academic Emergency Medicine physicians.

The Department of Emergency Medicine (<http://smhs.gwu.edu/emed/>) provides staffing for the emergency units of George Washington University Hospital, United Medical Center, the Walter Reed National Military Medical Center, and the Washington DC Veterans Administration Medical Center. The Department's educational programs include a four-year residency and ten fellowship programs.

Responsibilities include providing clinical and consultative service; teaching Fellows, Residents, and Medical Students; and maintaining an active research program. These non-tenure track appointments will be made at a rank (Instructor/Assistant/Associate/Full Professor) and salary commensurate with experience.

Basic Qualifications: Applicants must be ABEM or AOBEM certified, or have completed an ACGME or AOA certified Emergency Medicine residency, and be eligible for licensure in the District of Columbia, at the time of appointment.

Application Procedure: Complete the online faculty application at <http://www.gwu.jobs/postings/56800> and upload a CV and cover letter. Review of applications will be ongoing beginning November 30, 2018 and will continue until positions are filled. Only complete applications will be considered. Employment offers are contingent on the satisfactory outcome of a standard background screening. Questions about these positions may be directed to Department Chair, Robert Shesser M.D., at rshesser@mfa.gwu.edu.

The George Washington University and the George Washington University Medical Faculty Associates are Equal Employment Opportunity/Affirmative Action employers that do not unlawfully discriminate in any of its programs or activities on the basis of race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity or expression, or on any other basis prohibited by applicable law.



7 Distinct Locations in Norfolk, Virginia Beach, and Suffolk

Since 1972, Emergency Physicians of Tidewater has delivered emergency care to Southeastern Virginia EDs. Our seven locations allow our physicians to choose a location based on patient acuity, ED flow, resident coverage, and trauma designation. EPT employees enjoy the coastal living in Virginia Beach and Norfolk as well as the perks of having plenty US history, quaint towns, and mountains just a short drive away.

Opportunities:

- Flexible Schedule
- Leadership & resident teaching (bedside teaching, SIM lab, mock oral boards, lectures)
- Many options of involvement within the group (board representation, committee membership, etc.)
- Employees have the option to pursue our 2-year track to partnership
- Top Ranked Regional Retirement Plan

7 Hospital Democratic Group | Partnership Track | Teaching & Leadership Opportunities

Please send your CV to EPTrecruiter@gmail.com

SEEKING EMERGENCY DEPARTMENT PHYSICIANS

The busiest ED in North Carolina, and one of the top 15 busiest in the nation, treats 95k adult and 35k pediatric cases annually in its 92 beds. We are currently seeking residency trained BC/BE emergency physicians to work in the 75 bed adult ED. This ED serves a high acuity patient population with 28% annual admission rate. There are over 90 hours of adult physician coverage daily and over 110 hours mid-level coverage daily. It is a Level III Trauma Center with robust hospitalist service, interventional cardiology 24/7, cardiac surgery, neurosurgery, etc. The facility is Chest Pain and Stroke accredited. The EMS system is hospital owned and managed with an award winning paramedic program. Of note, the Pediatric ED is separate and has 17 dedicated beds with an additional 24 hours of physician coverage and 20 hours of mid-level coverage. We welcomed our inaugural class of Emergency Medicine Residents in July 2017. Opportunities exist for both clinical and academic emergency physicians.



EXPECTING TO BE EXCITED AND CHALLENGED?

Come join our team today!

TOP TIER COMPENSATION

The cash compensation package is valued at over \$250/hour, including evening, night, and holiday differentials, as well as a quarterly incentive bonus. We offer a generous sign-on bonus plus moving stipend. The comprehensive benefits package includes Malpractice Insurance Paid; CME Time and Allowance; 403(b) match and 457(b); and health, dental, and other desirable benefits.

THE AREA

Cape Fear Valley Health is located in the thriving and diverse community of Fayetteville, NC which consists of more than 319,000 residents. Fayetteville has received the prestigious All-America City Award three times from the National Civic League.

Known for its many golf courses (Pinehurst is located only 30 minutes away), our central location provides easy access to beautiful beaches to our east and to the majestic Blue Ridge Mountains to our west. Our mild climate, low cost of living, and patriotic spirit makes our location ideal for rising healthcare professionals and families.



CAPE FEAR VALLEY HEALTH

Please contact Ashley Dowless, Corporate Director, Physician Recruitment
at 910-615-1888

or adowl@capefearvalley.com for additional information.



SAN FRANCISCO BAY AREA



EMERGENCY DEPARTMENT OPPORTUNITIES

SAN LEANDRO AND ALAMEDA HOSPITALS

Board Certified/Eligible Physicians

OakCare Medical Group is seeking qualified emergency medicine physicians to provide coverage at San Leandro and/or Alameda hospitals on a part-time or full-time basis with benefits. Day, swing, and evening shifts are available.

The combined census is 55,000 with specialty care and level 1 trauma center Highland Hospital nearby for collaboration and support. There may be an opportunity to combine these shifts with additional shifts at Highland hospital for those interested and could potentially include limited teaching opportunities. Come join us in creating the highest quality care for our patients and our community.

Indications of interest along with your CV should be sent to Tamika Walker at hr@oakcaremedical.com.



Full-Time and Part-Time Shifts Available

Employed and Contractor Positions

Potential for shifts at Highland Hospital with Teaching and research opportunities with Emergency Medicine House Staff

Contractor Rate of \$220 per Hour

OAKCARE MEDICAL GROUP

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510-645-1179

For More Information:
Barry Simon, M.D.
Chair, Emergency Medicine
bsimon@alamedahealthsystem.com

Emergency Medicine & Toxicology Faculty

Rutgers Robert Wood Johnson Medical School

The Department of Emergency Medicine at Rutgers Robert Wood Johnson Medical School, one of the nation's leading comprehensive medical schools, is currently recruiting Emergency Physicians and Medical Toxicologists to join our growing academic faculty.

Robert Wood Johnson Medical School and its principal teaching affiliate, Robert Wood Johnson University Hospital, comprise New Jersey's premier academic medical center. A 580-bed, Level 1 Trauma Center and New Jersey's only Level 2 Pediatric Trauma Center, Robert Wood Johnson University Hospital has an annual ED census of greater than 90,000 visits.

The department has a well-established, three-year residency program and an Emergency Ultrasound fellowship. The department is seeking physicians who can contribute to our clinical, education and research missions.

Qualified candidates must be ABEM/ABOEM certified/eligible. Salary and benefits are competitive and commensurate with experience. Sub specialty training is desired but not necessary.

For consideration, please send a letter of intent and a curriculum vitae to:

**Robert Eisenstein, MD, Chair, Department of Emergency Medicine
Rutgers Robert Wood Johnson Medical School
1 Robert Wood Johnson Place, MEB 104, New Brunswick, NJ 08901**
Email: Robert.Eisenstein@rutgers.edu
Phone: 732-235-8717 • Fax: 732 235-7379

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EMERGENCY MEDICINE

Health System

BC/BE EMERGENCY PHYSICIANS NEEDED to join current staff of 40+ physicians

- **Level I Trauma Center with 75 beds and fast track**
- **Medical Observation Unit with 16 beds**
- **Pediatric ED with 16 beds**
- **Community hospital ED with 21 beds**

EXCELLENT COMPENSATION PACKAGE!

- **Competitive salary with RVU-based incentives, CME, paid vacation, health/life/malpractice, 401k**

Huntsville Hospital is looking for additional coverage for our progressive Emergency Department. We see approximately 150,000 patient visits per year across our 4 different units (Level I Trauma Center, Medical Observation Unit, Pediatric ED at Children's hospital, community hospital in Madison - plus an OB ED staffed by our OBGYN Hospitalist team. Our physicians work an average of 14-15 shifts per month (9-10 hours per shift), allowing for an excellent work/life balance. Teaching opportunities with 3rd/4th year medical students from UAB and Family Medicine and Internal Medicine residents at UAB-Huntsville rotate through our ED.

Qualified candidates include: Emergency Medicine and Family Medicine physicians. Huntsville Hospital is a Level I Trauma Center and the Regional Referral Center for North Alabama and Southern Tennessee. Huntsville Hospital is Alabama's only Top 50 Heart Hospital by Truven Health Analytics and one of America's 50 Best Cardiac Surgery Programs by HealthGrades.

Huntsville is situated in the fastest growing major metropolitan area of Alabama, and with the highest per-capita income in the Southeast, Huntsville is the best place to live, learn, and work. We are a community on the move, rich with values and creative talents. These unique characteristics will certainly provide a place for you and your family to flourish. With a population of 385K, we are a high-tech, family-oriented, multicultural community with excellent schools, dining, and entertainment - all nestled in the foothills of the beautiful Appalachian Mountains.

**For further information, please contact Suzanne LeCroix
at (256) 265-9639 or suzanne.lecroix@hhsys.org**



huntsvillehospital.org

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made
perfect.



Great Career vs. Great Life? Have Both

We provide the support and flexibility you need to balance your career and life outside of medicine.

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teamhealth.com/join or call **877.709.4638**

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Discover USACS where every full-time physician is given ownership. Culture matters. Find out why at USACS.com.



Own your future now. Visit usacs.com
 or call Darrin Grella at 800-828-0898. dgrella@usacs.com

