

EM Resident

Official Publication of the Emergency Medicine Residents' Association

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Broken Hearts

Spotting Aortic Dissection



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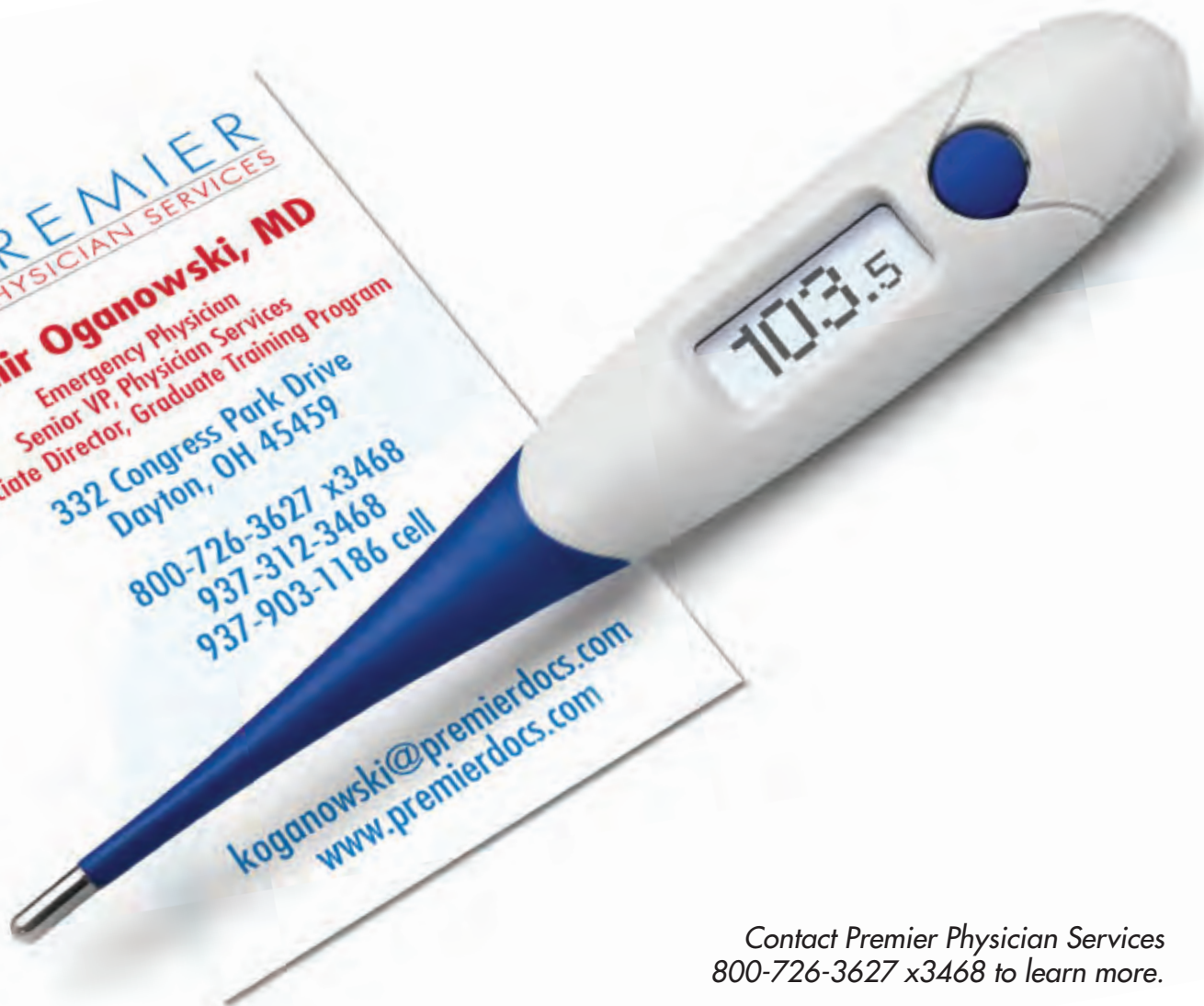


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EMRA prepares to blow into the Windy City this October

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Every autumn, EMRA gears up for its biggest meeting of the year, held in conjunction with ACEP's *Scientific Assembly*. This year for ACEP14, our destination lies in the Midwest — in a city that dyes its river green every St. Patty's Day and makes a pizza deeper than anywhere else in the land — Chicago.

EMRA programming begins on Saturday, October 25 with our medical student events, which includes our amazingly active and engaged Medical Student Governing Council's meeting, as well as a mixer with EMIG representatives. Sunday features the Medical Student Forum, followed by EMRA's Residency Fair. **Nearly ALL of the residency programs in the country will be represented — so break out your nice clothes and get ready to put a face to your application!**

Monday kicks off EMRA's resident programming with our Bloody Mary Breakfast (there are mimosas as well, for those of you who prefer sweet over spicy). Following the breakfast is the EMRA Resident Forum.

Later in the day, the EMRA Job Fair will feature hundreds (yes — hundreds!) of employers and fellowship programs, who all want to meet *you* and see what you have to offer. Make it easy for them and **have a polished CV and impressive list of intelligent questions** (for help with this and other career-planning topics, check out www.emra.org/resources/career-planning).

The next two days will be even more jam-packed with the EMRA Representative Council Meeting, where we will discuss resolutions pertinent to our specialty and our organization — **and where we will also elect new board members**. EMRA's committees and divisions will also have the opportunity to meet face-to-face, an event that only happens twice a year. If you're a member of an EMRA committee or division,

attending this meeting is a great way to **get more involved** and to help guide the future direction of the organization.

Tuesday evening will feature an event 40 years in the making — EMRA's 40th Anniversary Celebration! Come mix and mingle with EMRA members past and present, and share our excitement in marking this amazing milestone. Then, the good times will culminate with the famed EMRA Party!

So make your schedule requests, swap whatever shifts you have to, pack your bags, and prepare for a meeting that will educate you on core and cutting-edge topics in emergency medicine, reinforce your choice of specialty, and provide plenty of fun and entertainment all at the same time. **See you in Chicago! ***



Jordan Celeste, MD
 EMRA President
 Brown University
 Providence, RI

Have you thought about running for the EMRA Board?

Positions up for election this year:

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- Vice Speaker of the Council
- ACEP Representative
- Legislative Advisor
- Membership Development Coordinator
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TAKING IT

We all experience different things in residency and come away with different perspectives, but there are a few things we all share in training. A constant sense of pressure and the need to “disposition” each patient as quickly as possible seems to be ever looming in our subconscious, if not outright in our thoughts. How quickly can we get that patient out the door, how fast will we make that diagnosis, when is that patient getting admitted? **We tend to want to wear efficiency as a badge of pride**, and somehow our specialty has fallen into the trap of believing that a *faster physician is a better physician*.

Before our hospital transitioned to a fully integrated EMR, we used to have a 9"×11" letterbox that would hold the newly-created patient charts for each individual

who had made it past triage and into our pod. We would scribble orders on the paper copies; somehow the nursing staff would decipher the illegibilities, and most of the time patient care flowed nicely. If ever there were more than one or two new unclaimed charts in the box, our senior residents would quickly offer a sometimes-grating reminder with a common phrase — “Hit the box!” With the advent of an electronic system and auto-dictating, the ability to speed up patient care has improved, but the same “hit the box” sentiment remains.

While hard work generally breeds a better worker, the idea of “faster is better” may not carry the same sentiment in medicine as it does elsewhere. At least it probably shouldn't. It is so easy to get lost in the flow and rhythm of our environmental

cycles that the real focus is easily often overlooked. People quickly turn into “creatinines,” “troponins,” and “x-rays.” **Numbers replace feelings, and urgency replaces care.** There are times when demands require our interactions be brief, and our decisions be quick. But, more often than not, **what patients need is not our brains, but our hearts.** Loss of empathy is a phenomenon that occurs around the country as we move from first-year medical students to interns to senior residents, and then to attendings. In a field like ours, the process can accelerate.

Starting in my second year of residency, I began to realize that it was getting easier and easier to pick out the “sick” from the “not sick.” People labeled as the latter were easily pushed aside, and “not sick”

started to become more “go away.” The faster they’re moved...the more I can see.

It took a moment of introspection for me to realize that **I was more often judging my quality of care by the number of patients I saw at the end of my shift, rather than the amount of difference I made in peoples’ lives.**

It’s true that letting that patient stay a moment longer takes up a bed in the ED. But sometimes letting them sit reveals surprising findings. The patient with gastro suddenly starts to look more like mesenteric ischemia; and by not

attention and listen to him. By slowing down and focusing on the patient as a *person*, we find a human beneath the disease. We may also realize what we so often forget — they’re coming to us because they need our help, however great or small that help may seem to us.

I remember back to medical school when we were taught that patients reflect more positively on physicians who enter the room and take time to sit at the bedside. They are perceived as better doctors — humanistic and more knowledgeable. Truth is, **patients don’t perceive you as a better doctor because you sat**

disparaging medical circumstances, he had a particularly positive interaction with the emergency physician. As he recounted the story, I realized there were several systems hiccups from the waiting room through the hospital stay that could easily have caused harm, or at least been cause for disgruntlement. But I was impressed that the **one thing he took home — more than anything else — was his interaction with the doctor in the ED.** The clinical care the doctor provided was very good, but it was the extra time he took with the family that made the experience so very positive. When the ED physician found out I was also an emergency medicine doctor, he even took the time out of what I know was a busy shift to call me and do a “doc-to-doc” — not because he had to, but because he cared. This physician’s compassionate attitude positively colored the entire rest of my family member’s stay in the hospital. For days afterward, all he could talk about was how great of a job the doctor did. **One man who took a little extra time made a huge difference.**

It reminded me of something else taught to us in medical school. As physicians, we can — and should — focus strongly on the quality of care that is provided. The average layperson isn’t impressed by how efficient or smart you are, but rather how personably you interact and how you treat people. Things as simple as an introduction and starting with a smile make a big difference in patient perception of care. We were taught that personable doctors are less likely to face a lawsuit, sometimes in spite of medical errors that were made. **Patients need to know that we care about them.** How different it is as a patient to be listened to, and not just told what to do.

We all progress from medical students through to attendings. It’s a long road that requires knowledge, vocabulary, repetition, and time; and it’s easy to fall into the routine of patterns and rushing from one patient to the next. “Hitting the box” and quick dispositions are required skills, but while all of our time is valuable to us, the most priceless of all is the time we give to our patients. ★

SLOW

We tend to want to wear efficiency as a badge of pride, and somehow our specialty has fallen into the trap of believing that a *faster* physician is a *better* physician.



Nathaniel Mann, MD
Editor, *EM Resident*
EMRA Secretary
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rushing to see the next potentially sick patient, you found the sick one under your nose. Maybe the reason that patient missed dialysis for the tenth time this month wasn’t because he didn’t want to go, but because he lacked the social infrastructure or medical understanding to see down-the-road consequences. Maybe its because dialysis fixes medical issues, but what this patient really needs is something more than a dialysis recliner and a mini-TV — someone to pay

down; they perceive you as a better doctor because you are one. Often the time we take with our patients means just as much — and sometimes even more — than the care we deliver. Creating time creates an investment, which pays dividends to both you and the patient.

I recently had a close family member who had a stroke. After some urging, he went to the local community emergency department, where, despite the somewhat

THE
ART
OF

*Like
medicine
itself,
adaptation
is an art.*

Adaptation



David Diller, MD
EMRA Academic Affairs Rep
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Portland, OR

The only thing more intimidating than your first day as an intern is your first day as an *attending*. There is the inherent realization that you no longer have the safety net of practicing under someone else's medical license. But even more than that, if you take a job at a different institution than where you did your residency training, you are forced to relive the same anxiety-provoking sensation you experienced as both a medical student at the start of a new rotation, and as a resident starting residency or off-service months.

When you graduate from residency, you feel comfortable practicing emergency medicine within the context in which you trained. Yet, more likely than not, your future place of employment will differ significantly — in a multitude of respects. **Moving to a different region of a country exposes you to a different patient population with a different set of disease processes,** some of which you may have never seen. Individual institutions will vary in everything from their charting and ordering systems, to their recommended

pharmacotherapies based on local antibiograms and departmental policies. Even the support and ancillary services will differ from where you trained. Will your future employer have an observation unit or a separate psychiatric ED? Will you have 24-hour in-house consultants? What about 24-hour radiology techs or social workers? The list of variables is endless, and we often go through residency oblivious to the different approaches to patient management that we will be forced to adopt.

While your first few shifts as a newly minted attending physician may cause some undue anxiety, learning to adjust your practice style during residency can relieve future apprehension. Whether you've already landed a post-residency fellowship position, or are just starting to consider going into community practice, use the patients that present to you during residency to start mentally training yourself for this transition. Is that STEMI patient a good candidate for TPA if your future employer doesn't have a cath lab? What type of antibiotics would you use for the patient with pyelonephritis if local resistance patterns were different? How about an alternative pharmacotherapy for chemically sedating agitated patients if your future emergency department doesn't stock your preferred antipsychotic or benzo? Performing these mini mental exercises on shift will not only help strengthen your clinical knowledge, but

they will ease the angst associated with post-residency transition.

Additionally, you should take advantage of the interactions with faculty members who have worked at other institutions. Inquire about their prior experience and practice patterns. Many junior faculty will have recently gone through this transition and can offer valuable advice. Regardless of where we end up, it is in our nature as emergency physicians to be versatile and skilled at adapting to new circumstances. **Embrace the cultural change as you switch institutions.** Don't fall into the trap of "Well, at my home institution we did it this way..." Take the opportunity to continue to learn medicine in a different light. It is amazing to witness the true breadth of our specialty. I recently transitioned to a new position, and have seen the differences in medical practice first-hand. I left my inner-city residency behind — with its underinsured patients, HIV, and sickle cell disease — and moved into a tertiary-care referral center, where seemingly every patient has been an organ recipient. It's a very different feel from where I trained. But it's all emergency medicine.

Leaving the comfort and familiarity of your residency program is an inevitable part of your professional pathway as you segue to the next phase in your career. Like medicine itself, adaptation is an art. Start preparing for this change during residency to help ease your transition — your future self will thank you. ★

RRC Committee Leaders

“You have the ability to help someone in crisis every single time that you go to work. That is pretty cool, and you should enjoy it.”

Dr. Philip Shayne



Dr. Wallace Carter



Dr. Philip Shayne

Interviews



Brandon Allen, MD
RRC-EM Representative
University of Florida
Gainesville, FL

I recently had the opportunity to sit down with Drs. **Wallace Carter**, chair, and **Philip Shayne**, vice chair, of the Residency Review Committee (RRC) for emergency medicine. I asked these physician leaders about everything from their positions with the committee to their thoughts on the future of the field.

In addition to his role as chair of the RRC, Dr. Carter is the emergency medicine residency program director at New York Presbyterian Hospital. He graduated from the Ross School of Medicine and completed residency at the Bronx Municipal Hospital Center and St. Barnabas Hospital.

Dr. Shayne, vice chair of the EM-RRC, has been the program director at Emory since 1999 and also serves as the university's vice chair for education. He graduated from the University of Pennsylvania in 1981, the University of Illinois at Chicago College of Medicine in 1989, and the Cook County Hospital Emergency Medicine residency program in 1993. He is past president of the Council of Emergency Medicine Residency Directors (CORD), and is an American Board of Emergency Medicine (ABEM) oral boards examiner.

How would you describe the RRC to a PGY-I resident?

Carter: *It is your training “safety net.” If your program has a 10-digit Accreditation Council for Graduate Medical Education (ACGME) program code, then it has undergone a rigorous evaluation process, including a site visit with accreditation specialists that is guided by very precise specialty requirements (which all residents should read at least once). Each specialty has its own RRC and specialty requirements. The great news is that residents are then free to choose a program based on personality, location, and practice type, and not worry if they are up to standard — the RRC has already done that for you.*

Shayne: *The ACGME is the non-governmental organization that has a mandate to accredit (approve) residencies and ensure they meet common and specialty requirements. Hospitals can't get funding to pay for residents unless the residency program is accredited. The ACGME has 27 specialty residency review committees comprised of mainly physicians in that specialty who maintain the requirements and ensure that residencies adhere to them. The ACGME is concerned about quality of education, resident wellness and safety, and the quality and safety of patient care.*

What are you most proud of during your time on the RRC?

Carter: *The last six years in the ACGME has been one of the most cataclysmic periods of change, next to the period around the Flexner Report. We are completely retooling the way we train physicians in this country. This new direction had tremendous potential to go badly. Instead, it went well, especially in emergency medicine, where our faculty and residents saw this as an incredible opportunity to embrace change and shape the future. As is the tradition of our specialty, EM became the change leaders within the ACGME.*

Shayne: *Not being assassinated (program directors don't like to be told how to do things). But seriously, it is an honor to be allowed to work with such a dedicated group, and I am proud of the expression of confidence from my peers when I was selected to be on the committee.*

What is your best EMRA memory?

Carter: *Passion and incredible energy. Whether it was Milestone creation or a program review, you knew that the residents knew how to bring their “A-game.” I was always nervous when I was paired with an EMRA resident for a program review because, invariably, they would find an issue I missed. To their credit, they were always most gracious about it. I learned early on in my tenure to never disagree with the resident.*

Shayne: *When I told the EMRA board that Emory didn't need a “residents' day” because **every** day was residents' day. They were too polite to tell me I was a self-righteous jerk.*

What are your thoughts on the Milestones?

Carter: *I am very excited about Milestones. Historically, evaluations were incredibly subjective. The evaluators were unsure what they should be evaluating, and the residents did not know on what they were being evaluated. For the first time, we have very clear ideas about what residents should look like by the time they graduate. The beauty of Milestones is that they need to be measured and validated. This hopefully begins to eliminate the evaluation card that says, “a great resident who is always smiling,” and replaces it with one that says, “a great resident who is always smiling who, during today's shift, was observed to complete a very difficult task that required team participation and advanced communication skills.” Can you see the potential?*

Shayne: *The Milestones are an interesting experiment. The Holy Grail has been to try and approve residencies by the quality of the physicians they train, as opposed to surrogate markers (e.g., number of ED patients in the hospital, the number of intubations by a resident, credentials of faculty). But it is very hard to measure competency or quality. The initial “core competency” experiment didn't work well; the Milestones are a way to get more concrete, detailed measurements of resident progress.*

As the chair and vice chair of the RRC, what are your roles in the grand scheme of academic emergency medicine and GME?

Carter: *As chair, I was incredibly lucky to be surrounded by nine superstars who could not wait to take on this challenge and make it perfect for our residents. The job of the chair and the committee is to be the GME community's “Switzerland.” We need to look at all of the competing needs and agendas of the various stakeholders and try to come to consensus, if possible, while being very aware that ultimately we must answer to our patients and residents.*

Shayne: *Wow, big question that could be answered in different ways. The RRC is the counterforce against the financial pressures and service burdens from the hospitals that employ residents. The committee needs to understand the specialty and the environment, and be both collaborative and firm in the interest of the residents. I guess, as chair, you get to set the tone. Vice chair gets to sit next to the guy who sets the tone.*

Do you have a prediction for a major change from the ACGME in five years?

Carter: *I think we will begin to see the very earliest benefits of changing to a system that requires data and is questing for outcome measurements. That will require a much longer time period to fully reveal itself, but — by then — we should have residents who are totally comfortable questioning every aspect of their training and thinking about how they can do it better.*

Shayne: *No fair — the Next Accreditation System (NAS) and the Milestones are once in 10- to 20-year seismic changes. The next five years should be spent organizing how the dust settles.*

Do you have a prediction for a major change in emergency medicine within the next five years?

Carter: Change is coming; I just have no idea what form it will take. The ACA, the current economics of health care, and the increasing intrusion of accrediting bodies who falsely cloak so many of their mandates under the mantra of “safety and quality,” will require EM practitioners to be incredibly flexible and creative. Otherwise, these bureaucratic intrusions threaten to get between us and our patients and threaten our ability to care for every patient who comes through our doors, which is the cornerstone of emergency medicine.

Shayne: Well, the easy ones are that we are going to be busier, more crucial, and require even more flexibility in what we do. Hopefully, the EMRs will start fulfilling their promise of integrating decision rules into our practice to make it more efficient, safe, and economical. The big change for us, I think, will be cuts in residency funding. Everyone who has a current spot got in at the right time.

You are both program directors at your respective programs. What is most rewarding about your position as PD?

Carter: I think that a PD is a lot like being a great chef. At the start, you have all of these wonderful ingredients, but they are unformed and — for the most part — tasteless. At the end of the process, you have the most wonderful creation that you get to share with the world. Both processes require attention to detail, technical ability, and the stamina to survive in a very hot “kitchen.” And both require you to break a few eggs.

Shayne: Watching residents grow and realize their potential. Residency is a very special time, during which you gain an incredible number of practical skills that allow you to use your knowledge for good. Residency also requires learning discipline, selflessness, balance, coping mechanisms, and professional demeanor. I love the end of June when we meet the interns-to-be — excited, scared, and mostly useless beside our experienced, weary, competent, and very ready senior residents. It makes our contribution to their development very tangible.

How has EMRA’s presence on the RRC impacted residents?

Carter: While everything that is done at the ACGME is in service to our patients, residents are the end users of all of the accreditation rules and standards. They bring that unique perspective to all of our deliberations and are our “content experts.” We could not do our job without EMRA.

Shayne: It ensures that the decisions that the RRC makes, whether for the specialty requirements or concerning an individual program, are vetted from the residents’

perspective. I think that we all have the residents’ best interests at heart, but the rest of our perspectives can be compromised by our understanding and sympathy with the struggles of the medical systems, departments, programs, and program directors. The thing that makes me valuable — lots of firsthand experience in running a program — can also be a barrier, and it is great to have a fresh set of eyes. Interestingly, sometimes it is the resident member who is the most militant about raising expectations.

What is the best advice you can give to graduating EM residents?

Carter: Relax, and welcome to the best job in medicine. Enjoy the fact that every day you will have a meaningful impact on your patients; in many cases, it will be lifelong. Enjoy the fact that on a Monday night you can save someone’s father, and the next afternoon you can be climbing a mountain or sailing. That does not exist in too many other specialties. Enjoy it!

Shayne: Enjoy the privileges and abilities that you have earned through your hard work. Enjoy that paycheck; you earned it. Enjoy having people thank you; you earned that. Enjoy how many jobs are available, how easy it is to relocate, and the respect that you get. You earned it. You have the ability to help someone in crisis every single time that you go to work; that is pretty cool, and you should enjoy it. ★

YOUR VOTE COUNTS!

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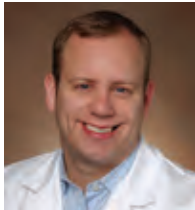
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If you are interested in running for a position, please email your CV, a statement of interest (200 words or less), letter of support from your residency director, and a photo (JPG format) to cwise@emra.org by September 28. EMRA will post statements and photos received from candidates on the EMRA website. Nominations from the council floor will also be accepted.

**EMRA elections will be held during
ACEP14 Scientific Assembly
in Chicago on October 28.**



Jenelle Holst, MD
Resident
Denver Health
Medical Center
Denver, CO



Jason Hoppe, DO
Assistant Professor
University of Colorado
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Case

A 52-year-old woman with a history of diabetes, hypertension, hyperlipidemia, neuropathy, and frequent urinary tract infections arrives by ambulance for progressive confusion over the last three days. Her medications include: atorvastatin, gabapentin, glipizide, metformin, paroxetine, quetiapine, tramadol, hydrocodone/acetaminophen. On arrival, she is confused, moaning, and agitated.

Her vitals are: BP 122/79, HR 85, T 34.9°C, RR 24, and SpO2 97% on room air.

Labs show a hyponatremia of 124 mmol/L, hyperkalemia of 5.5 mmol/L, glucose of 53 mg/dL, a severe acidosis with bicarbonate <5 mmol/L, and an anion gap of 30 with acute renal failure with a creatinine of 10.2 mg/dL (baseline 0.7 mg/dL).

A venous blood gas reveals: pH 6.7, lactate 20 mmol/L.

Metformin-Associated Lactic Acidosis **T****XI**C **RELATIONSHIP**

Metformin toxicity, while rare, is important for the emergency physician to recognize in order to initiate prompt, life-saving interventions.

Of all of the marked laboratory abnormalities discovered in this patient, probably the most shocking finding is the severely depressed pH, which is out of proportion to clinical presentation. The differential diagnosis at this point should include sepsis, diabetic ketoacidosis, alcoholic ketoacidosis, toxic alcohols, and biguanide (metformin) toxicity. While this particular patient’s presentation is likely multi-factorial, she also has metformin-associated lactic acidosis (MALA), secondary to metformin use during renal failure.

Incidence and Pharmacology

MALA can be caused by: **1) therapeutic metformin toxicity**, where a patient continues prescribed metformin during poor tissue perfusion (congestive heart failure, myocardial infarction, sepsis) and renal failure, leading to drug and

lactate accumulation, and **2) deliberate overdose**. The former is rare, but far more life-threatening due to comorbidities and renal failure.¹ Estimated incidence is three cases per 100,000 patient-years and mortality rate is 50%.²⁻⁵ Metformin is 90% renally excreted, and when glomerular filtration rate drops below 50 mL/minute, clearance is decreased.^{6,7}

Mechanism

Lactic acidosis is typically categorized in two distinct subgroups: types A and B. **Type A** is caused by impairment in tissue oxygenation, resulting in overproduction of lactate (i.e., shock, respiratory failure, sepsis, ischemic bowel, carbon monoxide, or cyanide). **Type B** is caused by compromised lactate metabolism without hypoxia, often seen in toxic ingestions (ethanol, propylene glycol, salicylates, biguanides, anti-retrovirals, etc., but also liver disease, thiamine deficiency,

or an inherited metabolic defect in lactate clearance). The exact mechanism by which supratherapeutic levels of metformin produce such a severe type B lactic acidosis is unclear, but it has been postulated that reduced gluconeogenesis may cause an increase in the gluconeogenic precursors including lactate and pyruvate, and/or inhibit pyruvate dehydrogenase, preventing conversion of pyruvate to acetyl-coenzyme-A.^{8,9}

Recognition and diagnosis

Early in the course, patients may have nausea, vomiting, diarrhea, abdominal pain, malaise, dizziness, and myalgias. They rapidly progress to encephalopathy with eventual respiratory failure and vasodilatory shock. Laboratory values include a severe anion gap metabolic acidosis, often with a pH <7.0, and a lactate >10, with hyperkalemia (secondary to acidemia and cellular shifts and/or

renal failure). Hypothermia and hypoglycemia are less common, but have been reported. **The diagnosis is made by clinical suspicion.** It is possible to test for a serum metformin level, but this usually takes days to result and is not helpful in the acute period. In the setting of acute ingestion, the drug reaches peak concentrations between 2-3.5 hours, thus patients can arrive stable and decompensate quickly in the ED.^{9,10}

Treatment

Metformin toxicity, while rare, is important for the emergency physician to recognize in order to initiate prompt, life-saving interventions. While supportive care will often help bridge the treatment gap, the definitive treatment is dialysis. Dialysis will treat the acidosis, clear the lactate and, to a smaller degree, will remove metformin; therefore, it is indicated in patients with renal failure, severe acidosis, or electrolyte derangements. Continuous veno-venous hemofiltration may be used if the patient is hemodynamically unstable,

but standard hemodialysis will correct the acidosis more quickly. Serial lactate measurements are a marker of metformin clearance and should be monitored during and after dialysis, as some patients may have rebound acidosis secondary to incompletely cleared metformin and thus require further dialysis. Since metformin is renally cleared, facilitation of renal recovery is key, as many of these patients present in renal failure. Bicarbonate may help to temporarily bridge a patient to dialysis, but should not be considered definitive treatment. If the patient presents with an acute (usually intentional) ingestion within 1-2 hours prior to arrival, activated charcoal should be used — or at least considered — for gastrointestinal decontamination.^{7,9}

Despite such severe metabolic derangements, **if patients are aggressively treated they can survive without residual deficits.** Interestingly, neither the pH nor the lactate levels are predictive of survival.¹¹

Patient follow up

The patient in this scenario became even more confused and obtunded, then suffered respiratory arrest with bradycardia. She received atropine, bicarbonate, and was intubated. Shortly thereafter, she became hypotensive with systolic blood pressures of about 70. Fluids and vasopressors were initiated, and the patient was transferred to the ICU for CVVH with bicarbonate buffer. The patient's acidosis had a nadir of 6.56 and recovered to 7.4 24 hours later. After 72 hours of CVVH, 8 days in the ICU, and an 11-day hospital stay, she was discharged neurologically intact, with normal renal function, and fully functional. Her diagnosis: Therapeutic metformin use with acute renal failure caused by urosepsis.

Summary

Metformin toxicity is an easily-missed clinical diagnosis in a patient with severe lactic acidosis and a severely depressed pH with decreased renal function. Prompt recognition leading to emergent dialysis can be lifesaving with good outcomes. ★

While supportive care will often help bridge the treatment gap, the definitive treatment is dialysis.



SCORPION'S STING



Christine Huang, MD
EM Pediatric Resident
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Pediatric Complications

THE STING ITSELF DOES NOT USUALLY PRODUCE A LOCAL INFLAMMATORY REACTION, MAKING DIAGNOSIS DIFFICULT.



Figure 1.
Arizona bark scorpion
(*Centruroides sculpturatus*)

Scorpion envenomation is a common problem encountered in many parts of the world, and children are at greatest risk of severe complications. Although cases of scorpion envenomation are rarely fatal in the United States, management remains controversial.



THE ARIZONA BARK SCORPION CAN BE FOUND THROUGHOUT THE SOUTHWESTERN UNITED STATES, INCLUDING ARIZONA, NEW MEXICO, TEXAS, CALIFORNIA, UTAH, AND NEVADA

Background

There are over 1,500 species of scorpions worldwide, of which only about 50 are dangerous enough to harm a human. The Arizona bark scorpion (*Centruroides sculpturatus*) is the most clinically significant venomous species of scorpion indigenous to North America.¹

The Arizona bark scorpion can be found throughout the southwestern United States, including Arizona, New Mexico, Texas, California, Utah, and Nevada.² This scorpion's venom is composed of multiple heat-stable neurotoxins, an ACE inhibitor, and a component that inhibits platelet aggregation. The neurotoxins inhibit voltage-gated sodium channels of the peripheral nervous system, causing a prolonged membrane action potential and allowing repetitive axonal firing.³

Scorpion venom is potentially fatal, particularly to children and infants.

In the United States, there were 18,261 reported cases of scorpion stings in 2013. Of these, 5,187 cases occurred in patients 19 years of age or younger.⁴ The **pediatric population is the most vulnerable to the scorpion's neurotoxins**, resulting in the vast majority of severe cases requiring hospital admission. Most adults who are stung by the bark scorpion experience only localized symptoms.

Evaluation

Signs and Symptoms

The first symptoms of a scorpion sting are pain and paresthesias near the area of the envenomation. Unfortunately, the sting itself does not usually produce a local inflammatory reaction, making diagnosis in young children and infants difficult. Symptom onset is typically within a few minutes after the sting and progresses to its maximal effect within five hours. Without antivenom, the average time to

resolution of symptoms is approximately 30 hours. More severe reactions can result in cranial nerve findings, neuromuscular abnormalities, and/or autonomic dysfunction. Interestingly, the venom interacts with several autonomic adrenergic and cholinergic receptors and can result in a mixed cholinergic-anticholinergic presentation, known as "hypercholinergic syndrome" (Table 1).

The most common presenting symptoms in the pediatric population are restlessness, writhing, opsoclonus, tachycardia, and hypersalivation.⁶ Rare symptoms include hyperthermia, rhabdomyolysis, gastrointestinal disturbance, respiratory failure, non-cardiogenic pulmonary edema, transient pancreatitis, transaminitis, coagulopathy, persistent neurologic dysfunction, and multisystem organ failure.⁵ The severity of envenomation is graded on a scale from I to IV (Table 2).

Labs

Patients with grade III or IV envenomation should have additional labs drawn based on clinical findings to evaluate for problems such as electrolyte abnormalities, rhabdomyolysis, and end-organ dysfunction. For patients with underlying comorbidities, blood glucose monitoring and ECG should be considered as well.⁵

Management

Management of scorpion envenomation is based on clinical severity. Patients who present to the emergency department with grade I or II envenomation can be managed conservatively with local pain control. Given that a scorpion sting is considered a puncture wound, the patient should also have their tetanus updated if not current.

Grade III or IV envenomation may require administration of anxiolytic and analgesic medications. Neuro-muscular hyperactivity should be managed with short-acting benzodiazepines such as midazolam.⁸ It is important to achieve adequate pain control with a short-acting opioid – fentanyl is often preferred because it releases less histamine than other opioids.⁶ In extreme cases, patients may progress to respiratory failure and require mechanical ventilation. Small doses of atropine have been used to counteract the venom’s hypercholinergic effects, although there have been no studies conducted to evaluate its efficacy. Many patients are treated concomitantly with intravenous fluids. Given the hypercholinergic state that is produced by the scorpion venom, it is important not to misdiagnose these patients with anaphylaxis. Administration of systemic epinephrine, or racemic epinephrine if stridulous, might cause further patient harm.⁵

Antivenom

The use of antivenom for the treatment of scorpion envenomation remains controversial. The first FDA-approved scorpion antivenom (Anascorp®) was introduced in August 2011. Factors that limit its use are the high cost per vial and side effects that range from rash to hypersensitivity reactions. The venom is made from horse proteins, so it should be used with caution in those with sensitivity to equine formulations. If a hypersensitivity reaction or anaphylaxis occurs to the

antivenom, it should be treated as it would be in any other similar situation.

Typically between three and five vials of antivenom are required per scorpion sting. It is important to consider that antivenom may have an additive sedating effect if given to patients who have recently received benzodiazepines.⁵ Despite these factors, advocates of the use of scorpion antivenom refer to multiple published studies that have demonstrated that its use significantly decreases symptom duration, with resolution in as little as three hours.^{2,9}

Disposition

Pediatric patients who have been observed in the ED for at least five hours after a scorpion sting without progression of symptoms beyond grade I or II can be safely discharged home. Patients who have a grade III or IV envenomation will likely require treatment with antivenom and/or hospital admission for symptom management; they have a higher likelihood of requiring advanced supportive measures.

Conclusion

While thousands of individuals are stung by scorpions every year in North America, few are seriously affected. Most of those who develop severe symptoms, including somatic or cranial nerve dysfunction, are in the pediatric age group. Benzodiazepines and opioids are currently the standard of treatment, though intravenous fluids, atropine, and antivenom have also been used. Naturally, supportive care should be administered as needed. Treatment with antivenom should be considered for those with severe envenomation, though a few cautions exist. Importantly, since these patients can appear anaphylactoid, a thorough history and exam for findings of the hypercholinergic syndrome should be performed in order to guide treatment and avoid therapeutic misadventures. Since maximal time to onset is typically five hours, patients with only localized symptoms can be safely discharged home if there is no progression of the disease after observation for that period of time. ★

Table 1. Signs and Symptoms of Scorpion Envenomation

CRANIAL NERVE FINDINGS Blurred vision, opsoclonus, ^a nystagmus, tongue fasciculations, and bulbar dysfunction (dysarthria, stridor, pharyngeal spasm, and dysphagia)
AUTONOMIC DYSFUNCTION Hypercholinergic syndrome (tachycardia, hypertension, sialorrhea, lacrimation)
NEUROMUSCULAR ABNORMALITIES Restlessness, skeletal muscle fasciculations, jerking and flailing of the extremities, opisthotonos, ^b emprosthotonos, ^c ataxia, loss of coordination

Adapted from Skolnik et al.⁵

^a Opsoclonus = rapid multivectorial involuntary eye movements (rotary eye movements)

^b Opisthotonos = tetanic backward hyperextension of the head and lower limbs

^c Emprosthotonos = tetanic forward flexure of head and feet toward one another

Table 2. Grade of Envenomation/Clinical Description

GRADE I Pain and/or paresthesia at envenomation site	GRADE II Pain and/or paresthesia, both local to, and remote from, envenomation site	GRADE III Either cranial nerve or somatic skeletal neuromuscular dysfunction	GRADE IV Both cranial nerve and somatic skeletal neuromuscular dysfunction
--	---	--	--

Adapted from Curry et al.⁷



Health Policy from the Leadership and Advocacy Conference



LOBBYING WITH ACEP

Each May, emergency physicians from across the country converge in Washington, D.C. at ACEP's *Leadership and Advocacy Conference (LAC)* to **advocate for issues affecting our specialty and our patients**. Didn't make it to this year's LAC? Here is a brief run-down of the bills your ACEP and EMRA colleagues supported.

The GME and SGR

Two of the largest topics tackled by ACEP and EMRA this year were perennial issues facing medicine — government cuts to GME and SGR funding. Both of these issues have huge implications for the medical community at large and have been long-running debates spanning years, with frequent quick-fixes and legislative patchwork filling in needed gaps.

Graduate Medical Education (GME) funding is paid out of Medicare and is used to cover the **direct and indirect costs of training residents** (everything from resident salaries to less efficient utilization of hospital resources by trainees). Cuts to this funding, or failure to expand it in proportion to the increasingly aging U.S. population, sets the health care system up for future staffing shortages.

The Sustainable Growth Rate (SGR) is part of a complex formula Medicare uses to reimburse physicians for their work. The trouble is, this formula has not been updated since 1997 and has failed to keep up with rising health care costs. Every

few months, Congress enacts a temporary measure to prevent the now outdated SGR calculations from actually being used to compensate physicians, but despite years of effort, they can't quite manage to fundamentally change the flawed formula.

ACEP and EMRA were — and continue to be — in support of permanent fixes to both of these issues. For more information on these topics, please refer to the EMRA Health Policy Committee's *Health Policy Basics for Residents and Medical Students*, which can be found online at emra.org. The rest of this article will focus on lesser known and more recently conceived health policy initiatives.

Mental Health

- *H.R. 3717: Helping Families in Mental Health Crisis Act*

H.R. 3717 opens more resources toward psychiatric care and allows physicians to bypass aspects of HIPAA to provide needed care to patients. In the wake of recent shootings, this bill has understandably picked up steam and drawn a fair amount of controversy, particularly the idea of "bypassing HIPAA." While readers are entitled to their own opinions, one must remember that **the judgment call to release health information against a patient's will falls onto the physician**. We protect ourselves from the liability of taking risks by documenting our rationale and the evidence supporting it, which this bill would specifically require. In



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fact, the bill only applies to adult patients with more than one year of documented psychiatric illness, and those at risk of harming themselves or others. It also limits who can receive information (typically only caregivers such as family members or primary care providers).

The bill also creates more funding for mental health research, evidence-based improvements to existing mental health programs, and training for medical and law enforcement personnel to serve those with mental health issues. It mandates a qualified psychologist or physician to lead this initiative for the Department of Health and Human Services. Furthermore, the bill reforms current aspects of Medicaid and Medicare that fail to reimburse and protect providers who often treat patients with acute psychiatric illnesses without pay or liability protection. It also allows psychiatric hospitals to receive Medicaid

HEALTH POLICY

reimbursements like any other hospital. This will incentivize hospitals and providers to treat patients with acute psychiatric illnesses, instead of diverting them to public health systems or allowing them to fall through the cracks altogether.

Liability

- H.R. 36: *Health Care Safety Net Enhancement Act*
- H.R. 4106: *Saving Lives, Saving Costs Act*

H.R. 36, which still needs a corresponding Senate bill, addresses the need for EMTALA services medical liability reform due to the rising shortage in on-call specialists available for consultation by emergency physicians. The federal Government Accountability Office (GAO) documented this shortage as early as 2003, and it is only expected to worsen as more patients — newly-insured under the Affordable Care Act (ACA) — flock to the ED. The GAO reports that in medical liability crisis states, access to emergency care decreases, leading to more delays and transfer of patients due to reduced availability of on-call specialists to emergency departments.

H.R. 36 provides a solution to the growing crisis in access to emergency care: emergency and on-call physicians who provide EMTALA-related services **should be judged as federal employees under the Public Health Safety Act, specifically with regard to liability protection when providing government-mandated care.** As emergency providers, we care for acutely ill or injured patients, often within the confines of limited time, and incomplete knowledge of their medical history, which leads to higher liability exposure. As federal employees, physicians would be covered by the Federal Torts Claim Act, which states that in malpractice cases, the *federal government* gets sued, and not the physician, unless the *physician* has acted with gross negligence.

Providing liability protection to physicians for the federally mandated EMTALA services rendered under H.R. 36 **will help ensure emergency and on-call physicians remain available to treat patients in their communities.**

This legislation will also help reduce the use of defensive medicine practices that drive up the overall costs of health care, which brings us to H.R. 4106 — the Saving Lives, Saving Costs Act. This bill provides increased liability protection, in the form of a legal safe harbor, to physicians who can demonstrate they followed clinical practice guidelines and best practices developed by a multidisciplinary panel of experts. This safe harbor liability protection gives physicians the ability to move their case to federal court with alternative dispute resolutions that decrease the cost of litigation and bring the burden of proof to the prosecutor rather than the defendant.

Emergency Medical Services

- H.R. 4080: *Trauma Systems and Regionalization of Emergency Care Reauthorization Act*
- H.R. 4290/S. 2154: *Emergency Medical Services for Children Reauthorization Act of 2014*

Trauma Care Systems Planning Grants and Emergency Medical Services for Children are two important federal programs that are expiring on September 30, 2014. Traumas are not limited to

cities; however, the lower trauma volumes in rural towns hinders adequate emergency preparation. H.R. 4080, the Trauma Systems and Regionalization of Emergency Care Reauthorization Act, will renew funding to maintain and improve regional trauma systems. Thirty million children receive emergency care each year, but EDs and EMS often have problems stocking necessary equipment and developing treatment protocols for them. H.R. 4290 (“Wakefield Act”) and S. 2154 (“Emergency Medical Services for Children Reauthorization Act”), both of which passed earlier this summer, renew the funding that addresses those problems.

Conclusion

Health policy advocacy goes beyond the ACA, SGR reform, and ACGME funding. A large variety of bills are in play, capable of affecting the way EM is practiced for years to come. Acute mental health care, liability associated with increased ED utilization, and resource limitations are issues emergency physicians encounter daily. Politicians *do* care about what physicians think. Whether or not you agree with ACEP and EMRA’s leanings, it is important you remind your representatives to take these issues seriously.

Vote! One voice may seem small, but it is infinitely more than nothing. You can also sign up for ACEP’s 911 Advocacy Network to stay informed of health policy issues as they develop throughout the year. We hope to see you at next year’s *Leadership and Advocacy Conference*, May 3-6, 2015, and hope that you will join your colleagues in advocating for our specialty and our patients. ★

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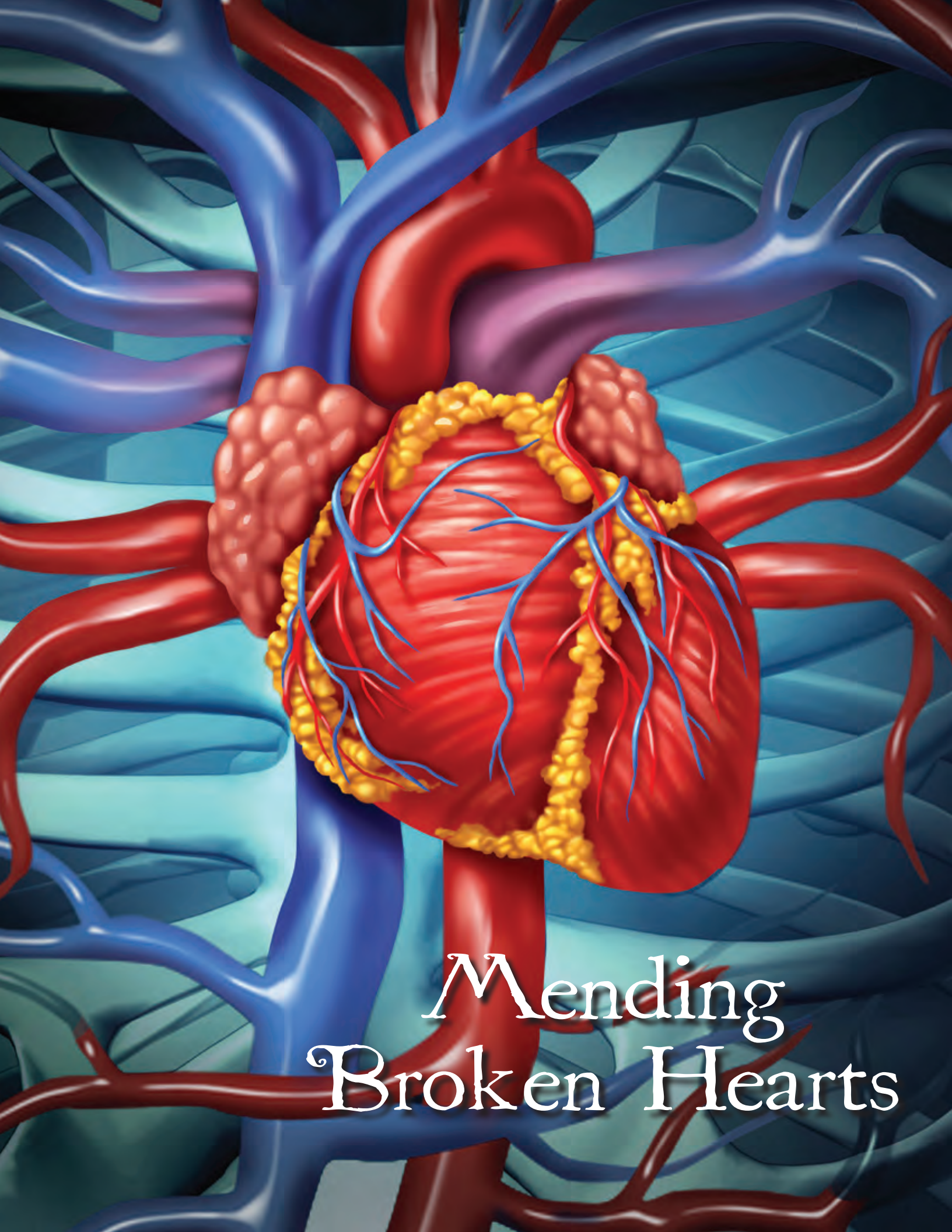
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Mending
Broken Hearts

Thoracic Aortic Dissection

A REVIEW



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Case Report

A 49-year-old male presents with a chief complaint of blurred vision. His vital signs show a blood pressure of 215/159 mmHg, a heart rate of 98, and respiratory rate of 18. Physical examination is unremarkable except for bilateral papilledema. His past medical history includes hypertension, which is poorly controlled due to medication non-compliance. A chest x-ray reveals a mediastinum measuring 11 cm. (Image 1) Based on this finding, the patient is immediately started on an esmolol drip, and a high-resolution CT angiogram of the chest is obtained. The CT reveals a Stanford type B, DeBakey type IIIb descending aortic dissection from immediately distal to the origin of the left subclavian artery to the origins of the renal arteries, with the celiac trunk being supplied by the false lumen. (Images 2 and 3) After the patient's heart rate is controlled on esmolol, a nitroglycerin drip is started to provide pressure control. He is ultimately admitted to the ICU for medical management, and discharged four days later.

Discussion

Estimates of the overall incidence of aortic dissection range between 0.5 and 10 cases per 100,000.¹⁻³ Thoracic aortic dissections are subdivided based upon the region of the aorta that is involved in the dissection. Stanford classification separates them into **type A** — those that have involvement of the ascending aorta (but may also have involvement of the descending segment), and **type B** — those which are confined to the descending aorta only. DeBakey classification divides them into 3 classes: **type I**, if both ascending and descending elements are present, **type II** if there is only ascending involvement, and **type III** with only descending involvement. Type III dissections are further subdivided into **types IIIa** and **IIIb** depending on their location relative to the diaphragm. The ascending variety is more severe as it can be complicated by vascular compromise of the great vessels of the head and upper extremities and disruption of the annular

ring of the aortic valve, resulting in acute aortic insufficiency and heart failure.

The classic presentation of sudden-onset, tearing chest pain is the most common by far; however, evidence of heart failure, shock, vascular compromise, focal neurologic deficits, or aortic valvular dysfunction may be the presenting signs and symptoms.^{3,4} Interestingly, **10-15% of all dissections present with no chest pain**, and pulse deficits are present in only about 15% of patients.^{3,5} There are multiple case reports of patients with vague symptoms, such as anorexia and night sweats, who were ultimately found to have chronic dissections and no other cause for their symptomatology.³ Atypical and vague complaints account for many cases being missed initially.

While dissection can be spontaneous, the vast majority of patients will have one or multiple risk factors. The greatest risk factor for development of an aortic dissection is hypertension. Other risk



Image 1. Chest x-ray demonstrating the typical finding of a widened mediastinum.

factors include the connective tissue disorders Ehlers-Danlos and Marfan syndrome, any family history of aneurysms, recent blunt trauma or deceleration injury, a bicuspid aortic valve, and pregnancy.^{1,3,6}

Evaluation for aortic dissection often begins with an ECG and a chest x-ray, as these bedside tests are generally readily

available. These two tests can help to rapidly risk-stratify patients with acute chest pain as potential aortic dissections, and help to promote proper treatment and avoid adverse events. If a proximal dissection involves any of the coronary ostia, an ECG may show signs consistent with an acute myocardial infarction; however, as many as one-third of initial ECGs may be normal.⁵ Chest x-rays offer a sensitivity of approximately 65% for aortic disease,^{6,7} and so are not perfect tests; clinical suspicion should also play into management.

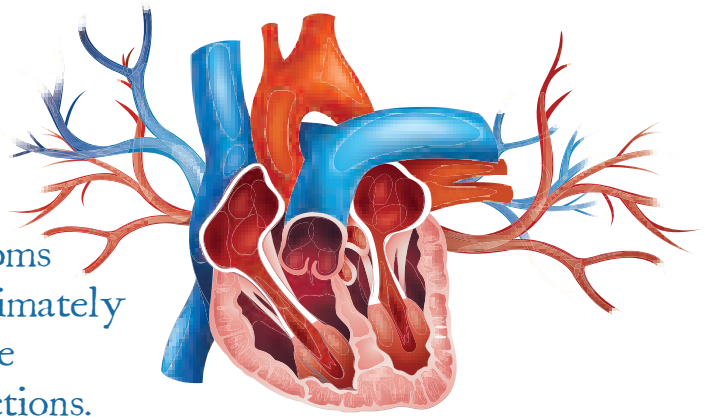
As many as one in eight chest x-rays will be completely normal in acute dissection.⁵ The prototypical finding is a widened mediastinum, usually greater than 8 mm, though other abnormal findings seen in dissection include intimal calcium separation (extension of aortic shadow >5mm beyond the aortic wall), and a left-sided pleural effusion.

Given the severity of the disease and the relatively high incidence of diagnostic uncertainty or ambiguous data, additional imaging should be pursued in cases of suspected aortic dissection.⁸ There are multiple additional imaging modalities available, including CT, MRI, and transesophageal echocardiogram (TEE), as well as traditional angiography. The decision is often guided by utility and convenience; thus, CT angiogram has become the modality of choice. Patient factors may also guide advanced imaging, and **TEE may well be the test of choice in unstable patients** as it can be done at the bedside without risk of the patient leaving the emergency department for imaging. Pregnancy, contrast allergies,



Image 2. CT angiogram of the chest revealing a Stanford type B, DeBakey type IIIb descending aortic dissection.

There are multiple case reports of patients with vague symptoms who were ultimately found to have chronic dissections.



ability to lie flat, and patient size may also guide imaging decisions.

Initial goals of management should focus on heart rate and hypertension. Higher heart rates increase the frequency of maximum stress on the dissection, and higher mean arterial pressures lead to increased average stress on the damaged vessel. Oftentimes patients with acute aortic dissection will present with severely elevated blood pressure, and it can be tempting to try and quickly lower their pressure with nitroprusside or other agents. It should be remembered, however, that anti-hypertensive medications that reduce blood pressure by reducing overall systemic vascular resistance will likely result in a compensatory hyperdynamic cardiac response that increases the heart rate and can worsen the disease process. Therefore, **initial management of aortic dissection first requires beta-blockade** to blunt this response. Esmolol is typically the agent of choice since it is easily titrateable and has a short duration of action; alone, it will have minimal to no effect on overall pressure. Once the heart rate approaches 60 bpm, the target for systolic blood pressure should be between 100 and 120 mmHg;⁹ a second agent, typically a nitrate-based vasodilator, should be added after beta-blockade if needed.

Mortality is much higher in dissection involving the ascending segment, and the standard of care has become endovascular stenting. Mortality for patients undergoing surgical intervention is near 30%, while those who undergo no invasive procedure have a mortality of about 60%.¹⁰ The standard of care for descending (Stanford type B) dissections is long-term medical management through control

of hypertension and other risk factors. Many of these patients have refractory hypertension, requiring on average four medications to control their blood pressure.¹⁰ Unless associated with a rapidly expanding aneurysm, patients with descending dissections are not typically managed surgically. This has been supported by the INSTEAD trial (INvestigation of STEnt-grafts in Aortic Dissection), which showed no difference in two-year mortality between those with descending stents and those treated medically.¹¹



Image 3. The dissection extends to the origins of the renal arteries, and the celiac trunk is being supplied by the false lumen itself.

While acute thoracic aortic dissection can represent a source of major morbidity and mortality, prompt recognition in the emergency department can improve patient outcomes. We should be vigilant, as diagnosis can sometimes be difficult, and identifying high-risk patients may uncover occult disease. Once discovered, proper control of **heart rate and blood pressure are the mainstays of treatment**. Whether treated surgically or medically, it is our responsibility to be the first to combat dissections. *



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One
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Advice on Preparing for a Career Abroad

Introducing the Expert

Dr. Stephanie Kayden grew up in a small town with little opportunity to travel. During her college years at Harvard, she worked as a travel writer; it was then that she decided on an international career. After completing residency at Yale, she went on to the Harvard International Emergency Medicine Fellowship, and has been happily employed in Boston ever since.

Dr. Kayden's fellowship experience has shaped many of the projects she shares with her fellows. Her work on mental and physical health in child soldiers and victims in post-conflict Liberia was one of the first studies to demonstrate a high rate of sexual violence against men in conflict zones. Today, she and her fellows have an ongoing project in Karachi, Pakistan to improve the response to local terrorist bombings, which strike on average once every three days.

On the following pages, she explains how to prepare for a career in global emergency medicine.



Q What types of international elective rotations do you suggest that IEM fellowship candidates do? Is your advice different for those in a residency with an established rotation versus programs without?

A Any rotation in policy, research, or clinical work can be a positive experience. Clinical experience may be the most useful because of the health system insights it provides. If your residency offers an international program, fellowship directors will expect you to have taken advantage of those resources. If not, it could be a red flag. But don't sweat it if you are from a program without international resources. It is a positive on your application to show that you independently arranged an overseas elective despite a lack of resources. Bootstrappers like this have been some of my most successful fellows.

Q What can I do to enhance my fellowship application?

A As a fellowship director, I am looking for how well an applicant understands the field, and what insights they have drawn from their international experiences. All applicants should take the opportunity to speak with leaders in international emergency medicine to get an idea of what this career is like. Also, try to attend the meetings of the ACEP International Section or SAEM's Global Emergency Medicine Academy. Network there to gain a better understanding of the practice.

In your fellowship application, share any insights you have about your international experiences to display what you learned from your time abroad. What did you gather about the local health system? If you think changes are needed, why do you think they haven't already been made?

Many people ask about board score cut-offs; we don't have them. We're more interested in your drive, your demonstrated potential, and your ability to be a good ambassador for our work. During interviews I ask myself, "Is this someone who could represent us well to a foreign minister of health?" In the end, it comes down to which candidate is the best fit for our program.

Q Can you start a project in residency that can carry over to fellowship?

A Absolutely! It is a key skill to be able to find a project, fund it, and keep it going over time. Ask prospective fellowship directors if you can bring your own project to the fellowship, but expect few to say "no."

Q How can you go about getting funding for electives in residency if your program cannot provide them?

A You may need to get creative. EMRA and the Global Emergency Medicine Academy (GEMA) offer funding opportunities, and some residency programs have seed grants. Certain departments provide funding for resident international projects. In-country costs can be very inexpensive, but the airfares are a major cost. I have seen residents build websites to ask friends and family for money; others have done moonlighting to fund their projects. For fellowship applications, add the grants you have applied for, even if you did not receive funding. It enhances your application to have written a grant proposal.



Applicants should take the opportunity to speak with leaders in international EM.

Q What options exist for residents who want to get involved in global EM research, specifically if there aren't any projects at their residency program?

A Global EM research is possible to do on your own, but the logistics can be difficult. Project delays, security issues, and funding challenges often derail plans. With a master's degree in public health or experience in study design, you could do an independent project, but it may need to be small in scope given the time constraints and fixed schedule of residency. It may be wise to hold off on international research until you get to fellowship. Instead, look for a high-quality research experience based at your home institution. Many of the skills you learn will carry over to international research later.

If mentorship is what you are lacking, seek out faculty at other residencies or in other departments: infectious disease, internal medicine, or public health. They can be great assets even though they are not from your specialty. Just remember to leave enough time to plan your project. You should start planning at least a year before your trip.

Q Who should do a fellowship?

A IEM fellowships are best for two kinds of people.

First, those who want to go into academic international emergency medicine. Fellowship is a great time to hone your research skills and develop your IEM network. Plus, there are so many IEM fellowships out there now that your future chair may wonder about someone who applies in IEM without one. There are very few academic IEM positions open each year, and the competition is fierce. Fellowships give you the time to jump-start your academic career.

Second, those who want to make a career in humanitarian work with aid agencies like Doctors Without Borders or the World Health Organization. In this case, be sure to choose a fellowship with opportunities in international relief.

Individuals who can skip the fellowship are those who want a typical emergency medicine career, but want to travel for short projects or medical missions a couple of times a year. Also, those who want to help develop emergency medicine in a single country over their careers may benefit from an MPH, but don't necessarily need to do a fellowship. The MPH will teach you about health systems and health economics in a way that is useful for EM systems builders.

Q What statistical or research skills should be developed during residency, and what's the best way to obtain them?

A There is no specific prerequisite for statistical or research skills; the fellowship and MPH degree will teach you those. That said, if you are working on a research project, you should understand the biostatistics needed for that project. If you do an international research project during residency, make sure you understand the project in its entirety; study design, funding, international coordination, methodology, data collection, and writing up the publication. Although it is rare for a resident to complete a whole international project from "soup to nuts" during residency, you should try to get some exposure to research, even if it's just data collection or background research for an article.

Q Is it possible or advisable to work on foreign language learning during residency?

A Foreign language study always helps — and I've studied quite a few — but ask yourself what your goals are. If you know you want to only work in a certain region for your entire career, it is helpful to be proficient in the native language. If your career will span multiple countries, then learning enough to be polite and to navigate your travels through each country is probably sufficient.

Rather than trying to learn every language, I believe it is better to learn how to speak English so that non-native speakers can easily understand you. Also, learn to work with translators. They will accompany you on many projects abroad, and knowing how to use them is essential to communicating well. And don't forget to read up on cultural norms and the basic history of the place you're visiting; browse the introductory pages of a good travel guide."

Q How does one balance the academic strength of a program with its particular geographical affiliations? For instance, if I really want to work in a particular country/countries in Africa, should I only apply to the programs that have existing affiliations there, or apply more broadly and plan to move later?

A Geographical affiliations can change for all programs depending on project flow. If you know that you want to build your career working in a certain country and need to develop your professional network there, then the geographical affiliation can be an important consideration.

That said, the quality of the training is most critical. When applying for programs, consider how well you'll be trained to start programs, write grants, and develop a sustainable academic career. You will need to learn how to work by yourself, be proficient in your research skills, and be able to educate individuals abroad.

One of the major functions of a fellowship is establishing your professional network — this will guide where you will likely practice following residency — so building those connections is key. One of the most difficult things to find in an IEM fellowship program is a true breadth of international experiences, which is critical for those who are not quite sure what their career niche should be. With a solid skill base and broad exposure to the field, most fellows find a career path they love.

Q Do you have any closing thoughts you would like to share with those pursuing a career in IEM?

A Global health fellowships have changed and become more competitive, but I encourage those truly interested to apply because the experience gained can lead to a very rewarding career! ★

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Beginning to invest money does not require a sophisticated understanding of economic theory.



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Taking the Financial Initiative

Every year the cycle restarts. Newly appointed senior residents begin to search for jobs, comparing locations, group sizes, and numerous other variables. Prior to graduation, residents should have some basic understanding of investment topics in order to prevent mistakes in the future. This article introduces a few concepts with which residents should familiarize themselves in order to establish their financial futures. Senior residents should begin learning about retirement account options in benefits packages. For the junior residents, there are some avenues that can be taken advantage of *now* that will no longer be an option with an attending-level salary. **Few, if any, medical schools teach personal finance.** The sources and references in this article will provide a base upon which all residents can build a stable financial future.

Average Growth is Ok Simplistic definitions

A share of **stock** represents fractional ownership of a company that can be purchased by an individual or group.

An **index** is a tracking of the cumulative gains or losses of many stocks. The Dow Jones Industrial Average tracks 30 specific stocks, whereas the S&P 500 tracks 500 stocks.

A **mutual fund** is a giant pooling of money from many investors. The pool becomes spread among different investments, of which the individual investors hold a certain share or percentage. Funds represent investments in stocks, bonds, real estate, or even other mutual funds.

A mutual fund that attempts to mimic a stock market index is called an **index fund**. For example, an S&P 500 index fund will course with the S&P 500. When the S&P increases, so does the value of the index fund. A pure index fund holder will not significantly beat the relative index, but will not underperform it either. Under-performing the market results in lost opportunity.

Start here: All residents should read “The Bogleheads’ Guide to Investing,” which breaks down different investment types for novices in a simple and understandable way.¹ A “Boglehead” is a person who follows the advice of Jack Bogle, the founder of The Vanguard Group, one of the largest financial firms in the world. Bogle pioneered index funds as a way for individuals to hold a large number of stocks through a mutual fund. This reduces individual risk of loss, allows investment portfolios to require minimal time for maintenance, and eases tax burdens from the investment. The knowledge from the Boglehead book can be parlayed into a resident’s current 401(k)/403(b) plans and future accounts. One can practically read it on a round-trip flight during a job interview.

Fund buddies: The Bogleheads have an open online forum providing financial advice, answers to questions, and news discussions consistent with the Boglehead philosophy of passive investing.²

An Option in Your Hands

Employer plans: Employers provide their employees 401(k) or 403(b) plans for retirement contributions. For-profit

companies offer a 401(k), and non-profit employers are mandated to provide a 403(b). Employees elect to contribute a certain amount of their paycheck to the plan, and often the employer provides a “match” to a certain limit. Index funds may exist in the plan in one form or another. The employee simply chooses the funds in which they’d like their money placed.

The default allocation of contributions does not reflect age or need. Typically, the default may not be appropriate for a resident. Accessing the account and changing the allocation toward lower cost funds and/or index funds should be a priority upon contributing.

A few variations on employer-type plans exist, but by and large the 401(k)/403(b) options encompass the majority of plans offered to a resident. Independent contractors have different plans available.

A Fruitful Container: The Roth IRA

Anyone can create an account for an individual retirement arrangement, or **IRA**. This arrangement exists outside of employer-provided plans and requires the individual to maintain the account through a broker. Common brokers include Scottrade, Vanguard, or E*Trade, though the list of providers is extensive. There are two types of IRAs: **Roth** or **traditional**.

Watch this: Blogger Kevin McKee exceptionally explains the difference between the two types of IRAs and the value of a Roth in a YouTube video.³ Searching YouTube for “What is a Roth IRA” yields his “Mr. Thousandaire” video as one of the first results.⁴ The video does more justice than any text can. After watching it, you should have an understanding of “pre-tax” money, which traditional IRAs and 401(k)/403(b) plans utilize, and “post-tax” money, the type put into a Roth.

An IRA allows investments in nearly anything, dependent upon where

MONEY MATTERS

the account exists. The most flexible accounts can be found through an online stockbroker or mutual fund company. Aforementioned index funds provide a simple and low-maintenance option to invest within a Roth. Billionaire Warren Buffet recommends Vanguard index funds.⁵

Compound it: For most residents, contributing to a Roth while in residency makes financial sense. A single resident with no side income, or even some moonlighting income, is likely eligible for full Roth contribution. An IRA has a maximum annual contribution limit that cannot be exceeded (\$5,500 for 2014), but no minimum amount exists unless specified by the brokerage firm.⁶

Developing a habit of saving money *now* increases the likelihood of hyperbolic account growth from continued contributions and compounding interest. Understand the concept of compound interest as a function of time. This remains critical to investments, notably those with dividend payments. The earlier you start, the more compounding can increase your investments.

Learn about the backdoor: Problematically, income restrictions exist for

contributions to an IRA; most attending salaries are too large to allow contributions into a Roth.⁷ There is a conversion trick known as a “backdoor Roth” that allows Roth contributions for high earners, but it requires a decent knowledge level in order to avoid tax penalties. Some preparation as a resident for future “backdoor conversions” can help save money in potential taxes if existing traditional IRAs exist in the portfolio.⁸

Finding a date: Roths can be opened and contributed to at any time. Contributions for each year can be made up until income tax is filed. For fiscal year 2014, for example, individuals have until April 15, 2015 to contribute based on their 2014 income. On April 16, or after filing a return, contributions apply toward the 2015 fiscal year. An increase in income, such as graduation from resident to attending, can create problems if income exclusions apply.

Choosing a Target

Choosing between Roth or 401/403 contributions as a resident requires attention to priorities. A 401/403 with an employer match is “free money.” However, **one cannot remove contributions from these**

accounts without penalties. If the funds in the account have high expense ratios, principle erosion from fees plays into the choice. In some circumstances, the account may have poor funds in general. Check with the account’s firm prior to contributing, asking for a list of available funds.

A Roth requires a more hands-on approach since the individual maintains the portfolio. Contributions can be removed without penalty, but penalties will be assessed when withdrawing appreciated interest or any gains. Therefore a Roth, with the resident’s low tax bracket, acts as a complex bank account. Withdrawing contributions requires significant paperwork, but if a catastrophe occurs, money is more accessible as opposed to a 401/403.

Insure Your Talent

The ally: James Dahle, MD, blogs about physician personal finance.⁹ Earlier this year, he published a financial “how-to” book titled *The White Coat Investor* (WCI), which is also the title of his blog.¹⁰ Both the blog and the book aim to educate physicians about financial topics. In addition to this, the WCI offers a physician-centric independent view on disability

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A sound disability insurance program is best developed while still in residency.

Obtain your disability protection NOW!

Visit the dedicated EMRA webpage: integratedwealthcare.com/physician-strategies/emra-members

Few, if any, medical schools teach personal finance.



and life insurance. Often, insurance salesmen approach residents in order to discuss life or disability products. This leaves a resident's knowledge limited to whatever the salesman tells them. The WCI familiarizes physicians with the background and basics of different insurance types in order to avoid costly mistakes. Prior to purchasing life or disability products, read his posts to make sure that the salesmen are giving you a "fair shake," as he calls it.

Owing Your Master

Student debt: Perhaps the most complicated financial aspect for residents and attendings revolves around paying off debt. How to address the issues and the time frame for repaying loans are frequent concerns. This topic extends well beyond the scope of a single article. **Paying off accrued interest monthly remains an imperative approach toward loans while in residency.** To avoid a required payment on the principle, you can enter residency forbearance through the vendor. This status allows a resident to have zero required payments on their graduate student loans.

Interest on the loans still accrues, so paying off the monthly interest keeps a level ground. Paying against the principle rests upon the individual's situation. **Residency forbearance does not count toward programs such as Public Service Loan Forgiveness.**

Upon graduation from residency, two firms can turn government loans into private loans with a lower interest rate. They are SoFi and DRB.¹¹ Before consolidating with one of these private firms, full knowledge of the disadvantages of reconsolidating should be weighed, such as forgiveness programs offered under federal rules.

Tap Your Favorites on the Weekend

Who to turn to: Using 30 books to study for the MCAT, Step 1, or in-service exams

causes diminishing returns, versus having one or two that fit an individual's style. The same goes for online financial advice. Ubiquitous investment advisors, blogs, and magazines offer opinions that create a lot of "noise." Finding a few respected finance blogs to read on a couch on Sunday mornings will keep financial literacy up to date and help with reducing mistakes.

Resources to Get You Stared

White Coat Investor

www.whitecoatinvestor.com

As mentioned, an EP maintains the blog, with occasional guest posts from lawyers,

Rick Ferri

www.rickferri.com/blog

An investment advisor, author, and index-fund champion with posts geared toward the serious individual investor, but often with posts applicable to all.

If You Don't Spot the Sucker in the Room...

Comprehending financial basics as a resident can prevent costly mistakes in the future. An advanced degree does not qualify a physician to have tacit knowledge about investing. The simplicity of index funds in a "three-



independent insurance salesmen, and others. One post has comments continuing *two years* after the original posting.

My Money Blog

www.mymoneyblog.com

This is a blog by a "DIY investor" who writes about a variety of financial subjects, particularly comparisons of retail services. His blog covers all aspects of personal finance, not just investments.

The Oblivious Investor

www.obliviousinvestor.com

A focus on investment accounts, it has a great end-of-week roundup of other financial blogs highlights.

fund portfolio," and an understanding of compounding interest can yield hundreds of thousands of dollars over 20 years.^{12,13} A primer on life and disability insurance can save hundreds to thousands of dollars per year. Self-educating while in residency needs to happen in order to prevent mismanagement and poor investment choices over the course of a career, and the hope for an on-time retirement. ★

Disclaimer: This article is only for information. Consult with your tax advisor for personalized guidance. The resources and blogs listed here are opinionated suggestions for which the author receives no compensation.

PRACTICAL Emergency Medicine Ethics



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Case

A regular “super user” of your ED, whom you have grown to know well, presents as he typically does. EMS drops him on a hallway stretcher, stating he is intoxicated — again. While he is generally mildly confused at baseline, you are

actually surprised to find him clinically sober with a clear thought process. You assess him to be alert and oriented to person, place, and time, but his initial vital signs are concerning. He is febrile and tachycardic and complains of a chronic cough, epigastric pain, and a mild frontal headache. Before you can go any further in the evaluation, he refuses all other diagnostics and therapeutics and demands to leave.

Discussion

This is a classic case of autonomy versus beneficence that highlights a number of important ethical issues we encounter on a daily basis in the ED: **refusal of care, decisional capacity, informed consent, and surrogate decision makers.** This patient is refusing all care; but can he make such a decision? Can we keep him from leaving, knowing that it is in his best interest to stay for further evaluation?

First, we must determine his decision-making capacity. To start, a person must be an adult; emancipated; or, if deemed incompetent by a court, have a legal representative (guardian) for important medical decisions.

Next, there are **three components of decisional capacity** that must be assessed:

- 1** the ability to understand the options,
- 2** the ability to understand the relevant consequences of the options, and
- 3** the ability to evaluate the costs and benefits of the consequences by relating them to a set of personal values and priorities.¹

Too often, physicians relay a desired course of action and then determine that the patient is capable of making complex medical decisions because they are “alert and oriented to person, place, and time.” The third component stated above — the ability of the patient to relate consequences to a personal value set — is critical in determining the capacity for decision-making because it addresses “the *why*.” *Why* does the patient want to refuse care? *Why*

does the patient desire to participate in such seemingly risky behavior? **This aspect of decisional capacity is often ignored, but may be the most important part.**

A nonsensical answer may trigger you to take patients’ autonomy away in order to apply necessary diagnostics or treatments because they cannot make decisions for themselves. In those situations, you are obligated to do what is in their best interests. If the answer makes logical sense and is aligned with their values and priorities, we are then obligated to respect their autonomy, even if we do not agree with their decision.

Decision-making capacity must be determined on a case-by-case basis. Just as circumstances change rapidly in the ED, so may the patient’s ability to make decisions. Therefore, **when you initially assess**



decision-making capacity, it applies only to the particular concern in question, and is not extended to other junctions. You are not making a global judgment on a patient's ability to make decisions.

In order to follow this stepwise process, we as physicians must appropriately disclose information and discuss the issues at hand, including the benefits and drawbacks of diagnostics and treatments (including non-treatment) so that the patient may be capable of making an informed decision. It is important to remember to be clear — **many adults function at only a fourth-grade learning level, and so our speech must be simple and understandable.** Additionally, the disclosure process ought to be tailored to the patient's desire for information. Some

patients want to be spared some, or all, of the details. In certain cultures, the patient may defer all conversations to a family member. Exceptions to informed consent do exist in cases of emergent care when a patient's life or limb is at risk, including cases of suicidal ideation. However, anyone who has spent time in an ED can acknowledge that many, if not most, cases are non-emergent and allow time for informed consent.

If you determine the patient cannot make an important decision, effort should be made to find the closest living relative, partner, or legal guardian who may be familiar with the patient's values and expectations regarding medical care. Although this is state- and hospital-specific, most institutions prioritize surrogate decision-makers in the following order:

- 1 Court-appointed guardian
- 2 Spouse (or perhaps domestic partner)
- 3 Adult child
- 4 Parent of patient
- 5 Adult sibling
- 6 Closest relative
- 7 Close friend

The last two are not set in stone, as it is often unclear if a cousin of the patient is better informed in the patient's medical care goals than a friend. **Without any identified surrogate for a person who has inadequate decisional capacity, emergent medical care should be rendered.** For invasive procedures, often two physicians may attest that a patient has no decisional capacity and that they are attempting to pursue the course of action that is in the patient's best interests. However, realistically there may not always be time for such processes in the ED.

One challenge regarding surrogate decision-makers is that two (or more)

prospective surrogates may claim responsibility for the patient. If the patient is married, there is often no question about who will be assisting in making decisions. However, more complicated scenarios often arise. One common scenario is when a non-legal long-term domestic partner is present, and his or her preferences are at odds with those of a patient's adult child or sibling. **It is important to know your state's statutes, most of which prioritize blood and legal relatives.** However, domestic partners or other family members — such as a cousin — may be functionally more involved in a patient's life and better informed on medical care preferences than an adult child of a patient who lives half way around the world.

Ideally, all critical stakeholders should be identified and allowed to participate; however, if an ED case is fast-paced and rapidly changing, **it may be more important to identify one key person to assist in decision-making.** Long discussions and debate among conflicting stakeholders can often be impractical in the emergency department.

There will be times when we will not agree with surrogate decisions. It is important to do what is reasonable and allow surrogates to act out what they believe the patient's wishes would be. However, **in the setting of unreasonable requests or demands, physicians are not obligated to act.** When a son wants "everything done" for his 102-year-old demented, bed-bound mother, it is ethically appropriate to do what we know will empirically benefit the patient. This may mean withholding invasive or "heroic" measures that may be less beneficial or detrimental. The most skilled clinicians will help guide the surrogate's decisions without coercion, allowing both the surrogate's and patient's interests to prevail. ★

Too often physicians relay a desired course of action, and then determine that the patient is capable of making complex medical decisions because they are "alert and oriented to person, place, and time."

Small Joints Spaces

Ultrasound-Guided Small Joint Aspiration

Case

A 52-year-old male was diagnosed with gout three weeks ago, and is now complaining of two days of worsening pain in his hands and feet. He has been taking colchicine without any relief of his symptoms. Pain and swelling persist, and are particularly worse in his right hand. He has no history of IV drug use and has avoided alcohol and red meat. He is febrile to 38.6° C, and an examination of the upper extremities reveals edema of the second and third metacarpophalangeal (MCP) joints of the right hand. The affected joints are tender and warm, with severely limited passive range of motion. A focused ultrasound of the right second MCP joint demonstrates a significant effusion (Images 1 and 2). Using ultrasound guidance, the joint is aspirated and returns approximately 2 ml of cloudy fluid that is sent for analysis. The joint aspirate shows 111,500 nucleated cells, and the patient is started on IV antibiotics and admitted after a hand surgery consult.



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Discussion

Musculoskeletal ultrasound is a common diagnostic procedure in sports medicine and is becoming more common in emergency medicine. It has been used to aid in diagnosis and in arthrocentesis of larger joints such as the knee; however, it can be useful in the evaluation of *all* joints. **Ultrasound can identify an effusion without the risk of radiation**, which is of particular concern for pediatric and pregnant patients. It can also help to narrow the differential diagnosis when a patient's history and physical are equivocal, and can be particularly useful in cases where it is unclear based on clinical exam if the patient has skin cellulitis overlying a joint or septic arthritis. If ultrasound of the joint in question reveals no effusion, then septic arthritis has been essentially ruled out.

One study revealed that ultrasound might reduce unnecessary arthrocenteses in the ED. Fifty-four cases of potential septic arthritis were identified, and emergency physicians were asked to decide if an arthrocentesis should be performed based on physical exam of the joint alone.

The study included a range of joints, 72% of which were planned for arthrocentesis as per the physician exam. Ultrasound performed on these joints reduced the number of ultrasounds performed to 37% of the total, based on presence or absence of an effusion.² Joint ultrasound saved these patients from an invasive procedure and allowed the physician to better delineate between a soft tissue infection and possible septic arthritis. It is important to remember that the ability to detect an effusion with ultrasound is operator-dependent. There are currently no known clinical criteria capable of ruling out septic arthritis.³ Physical exam, history, and serum biomarkers used in the acute setting have not shown to significantly increase the post-test probability of septic arthritis.⁴ The use of ultrasound to identify a joint effusion can help emergency clinicians to risk-stratify their patients with suspected septic joints.

Ultrasound can be especially helpful in small joints where physical exam may fail to demonstrate a palpable effusion despite the presence of a relatively significant joint effusion. Assessing for effusion with ultrasound

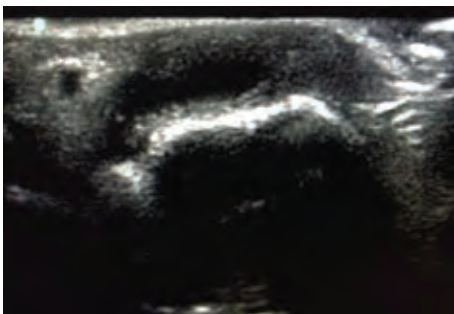


Image 1. Short axis view of MCP joint with effusion present.



Image 2. Long axis view of MCP joint with effusion present.

is more reproducible and accurate than physical exam alone.⁵ Once an effusion is identified, ultrasound can increase the success rate of arthrocentesis and can decrease the discomfort for the patient. When ultrasound guidance is utilized for arthrocentesis of the knee, patients report less pain and providers feel the exam is easier to perform.⁶ In a study comparing palpation and landmark-guided small joint arthrocentesis to ultrasound-guided arthrocentesis, those in the ultrasound-guided group had a success rate of 96%, compared to 59% in the palpation-guided group.⁷ It may be difficult or nearly impossible for the emergency physician to

perform an arthrocentesis of smaller joints without ultrasound. The morbidity of undiagnosed septic arthritis, particularly in joints of the hand, is very high. Thus, **it is imperative that emergency physicians become comfortable with using ultrasound for detection of joint effusion**, especially in smaller joints.

The Procedure

To perform ultrasound-guided small joint aspiration, the joint is first evaluated in long axis using the high frequency linear array transducer. The probe should be positioned with the indicator pointing proximally. It is easiest to begin scanning over the proximal phalanx to identify the echogenic extensor tendon overlying the hyperechoic bone. Tendons are more echogenic than muscle, and will appear as parallel lines connecting bones to muscle.

Follow the proximal phalanx and extensor tendon proximally to the MCP joint (Image 3). By rotating the probe 90 degrees to the left, the short axis is visualized (Image 4). The anechoic synovial fluid will appear black on the ultrasound screen, whereas bone will appear hyperechoic and white. The joint space will be identified as a small anechoic space between the proximal end of the proximal phalanx and the distal end of the metacarpal. A septic joint will often have a hypoechoic appearance, with dependent internal echoes due to the purulence of the fluid in the joint. In image 2, there is a collection of fluid noted in the second MCP joint extending distally beneath the extensor tendon, which demonstrates a joint effusion.

Once the joint effusion is recognized on ultrasound, an ultrasound-guided arthrocentesis can be performed. There are no absolute contraindications to the procedure. All contraindications, including overlying cellulitis, are relative.¹ Position the patient with his or her hand resting comfortably in a palm-side down position. The hand should be draped in sterile towels; the procedure is usually best performed with a Mayo stand.

Begin by thoroughly cleansing the skin. Lidocaine can be used for local anesthesia at the site of needle insertion; alternatively, a digital block may be used if necessary. The MCP joint should be imaged in the long axis using a linear array transducer with sterile probe cover. The probe indicator should be pointed proximally. Once the joint space is identified, it should be centered on the ultrasound screen. Because the MCP joint is so superficial, a medial or lateral out-of-plane technique is the preferred method for needle insertion.

Next, insert a 21-gauge needle attached to a 3-mL syringe in the dorsomedial or dorsolateral aspect of the joint toward the ultrasound probe, and under the extensor tendon (Image 5). **Continuous negative pressure should be applied to the syringe plunger while advancing the needle.** Advance the needle until the tip becomes visible underneath the tendon and inside the joint space on the ultrasound screen. Since the MCP joint is so small, only a few milliliters of fluid will be aspirated, even when the joint effusion is significant. ★



Image 3. Long axis index MCP joint.



Image 4. Short axis index MCP joint.



Image 5. Transducer in long axis on index MCP joint with needle entering.

Soft Tissue Infections and Ultrasound

INFECTING THE MASSES

Ultrasound has transformed emergency medicine and is a perfect non-invasive tool for improving diagnostic accuracy and procedural planning.



Image 1. Ultrasound showing the typical "cobblestone" appearance of a superficial cellulitis.

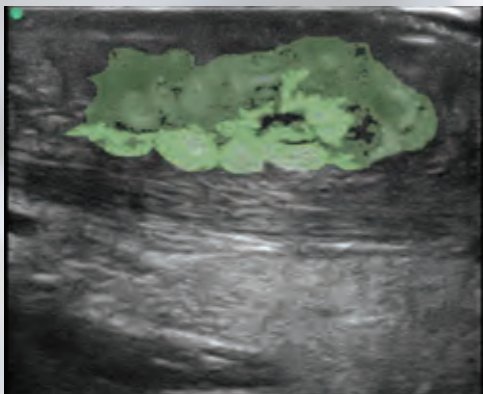
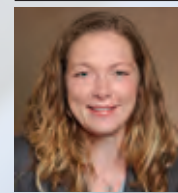


Image 2. Same image with adipose tissue in light green, and cellulosic fluid in darker green.

There are few tasks in emergency medicine that are as simple to perform — and also as deeply satisfying — as the draining of an abscess. The procedure requires almost no skill, yet it brings practically instantaneous relief for the patient and similarly rapid gratification to the physician. However, the converse is also true — there is a special kind of disappointment that comes when you stick a knife into a red, hot, indurated, fluctuant...cellulitis.

When compared to abscesses, cellulitis just isn't nearly as rewarding. There's nothing even remotely gratifying there; especially after you've cut a hole in it. Ultrasound is now standard use in most adult EDs around the country. This allows the technology to rapidly and easily differentiate the two, and even to identify small abscesses within areas of cellulitis. Ultrasound has transformed emergency medicine and is a perfect non-invasive tool for improving diagnostic accuracy and procedural planning. Still, some of the smaller nuances of ultrasound for soft tissue infections are lesser known to many practitioners of emergency medicine.

Ultrasound is highly effective for identifying soft tissue planes and abnormalities within them, usually with habitus and user skill as the only major complicating factors. Since frequency and depth of sonographic penetration are inversely proportional, using a high-frequency linear transducer for superficial areas of interest, and a lower frequency curvilinear one for deeper structures generally is best practice. In ultrasound of the soft tissues, the skin,



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subcutaneous tissue and fat, and fascia should be visible; generally, you can also observe muscle and additional fascial layers, depending on the location.

The epidermis and dermis typically will appear as a single thin hyperechoic stripe superficial to the comparatively hypoechoic subcutaneous tissue and fat. Beneath that, you will often find multiple thin hyperechoic fascial planes and dense muscle fascicles. Tendons, if present, usually are also visible and are distinguished by their symmetric and linear fibers. Flexion or extension of the adjacent joint will typically accentuate both tendons and muscle bellies. All of these soft tissues should be in relative

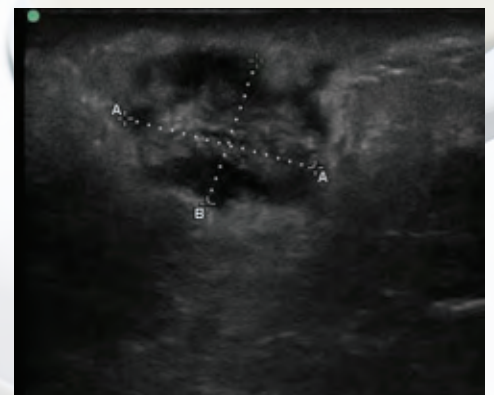


Image 3. Abscess with size delineated and varying echogenicity consistent with an evolving abscess.

approximation to each other without separation by hypoechoic fluid, which is what would be expected in the presence of infection.

Generally, when you're trying to differentiate an abscess from cellulitis, the infection will be in the subcutaneous tissue, so focus your attention on this area. Deeper infections are possible, and may affect fascia, muscles, or other tissues. **Be vigilant, and inspect all of the borders of the infection to help rule out something that may need surgical management.** In the case of cellulitis, the ultrasonographic appearance will change as the infection progresses. Early infection may result in swelling and a relatively hyperechoic appearance of the skin and subcutaneous tissue. If you're unsure, consider looking at the unaffected tissues or contralateral side for comparison. As cellulitis evolves, the adipose of the subcutaneous tissues will become infiltrated with hypoechoic fluid, leading to the classic "cobblestone" appearance (*Images 1 and 2*).

Abscesses may be seen without associated cellulitis, or within it. **Evaluate for hypoechoic areas that may or may not be septated.** Having an idea of loculations within an abscess can also help you plan your procedural approach. Additionally, while abscess cavities are often seen as uniformly hypoechoic, they can appear to have different echogenicities mixed within them. Abscess material with different densities will appear with varying echogenicity on ultrasound (*Image 3*). One potential pitfall to be wary of is that an evolving hematoma may also appear as a hypoechoic structure on ultrasound,

so clinical history and physical exam findings can be as important as the ultrasound exam.

Occasionally ultrasound examination of a fluid collection will reveal vessels nearby or directly underneath the infection. Similar to performing an I&D for peritonsillar abscess, knowledge of presence and depth may alter either the procedure or the clinical decision-making. Depending on the scenario, these fluid collections may actually represent an arterial pseudoaneurysm. Worse than the letdown of incising a cellulitis is the hemorrhage caused by opening an artery. Most ultrasound machines provide a coloring modality that can be used to differentiate vascular structures if there is clinical uncertainty.

At least one study has suggested that ultrasound-guided needle aspiration may be inferior to incision and drainage for management of community-acquired MRSA abscesses,¹ though anecdotal evidence is fairly ubiquitous supporting its use. **When presented with an abscess, it may be reasonable to first attempt a less invasive ultrasound-guided needle aspiration,** and then, if not successful, proceed to incision and drainage. This may be especially advisable in cosmetically important areas like the face.

It is still standard of care to perform complete incision and drainage with a scalpel, despite widely varying practice patterns. If you plan to use needle aspiration, the shortest appropriate large-bore needle that can be found should be used (as appropriate for the given area), followed by sonographic re-examination of the previously

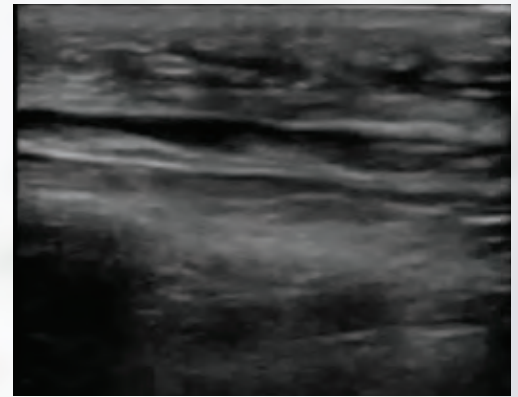


Image 4. Ultrasound consistent with necrotizing fasciitis, with fluid tracking along fascial planes.

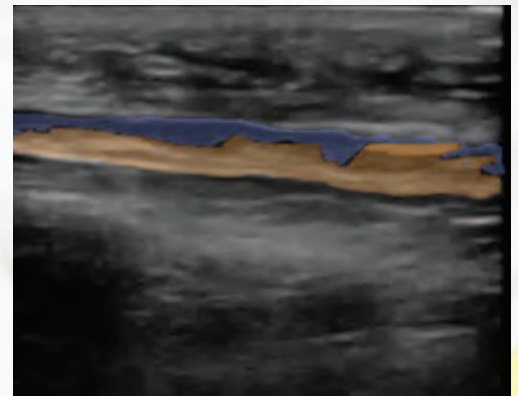


Image 5. Same image of necrotizing fasciitis with fascia in orange and fluid in purple.

identified fluid collection. Like other ultrasound-guided procedures, it is best to visualize the needle entering the fluid collection on the screen in real-time.

There is another important learning point to consider — when you're expecting to find either a cellulitis or an abscess on ultrasound, but you find neither, be on the lookout for necrotizing fasciitis. You may see fluid tracking on or between fascial planes and areas of "dirty" shadowing, consistent with gas artifact (*Images 4 and 5*). **As you know, this is a surgical emergency, and the appropriate resources should be quickly mobilized.**

By integrating a more advanced knowledge of soft tissue ultrasounds to your decision-making, your procedures will be both more satisfying and successful. By considering potential pitfalls on ultrasound and abscess mimics, you can reduce your complication rate and perhaps save patients from unwarranted invasive procedures. ★

In ultrasound of the soft tissues, the skin, subcutaneous tissue and fat, and fascia should be visible.

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If you've worked an ED shift lately, perhaps you've noticed how physics plays an important role in emergency medicine; but more likely, you have not.



Matthew T. Huberty, MSIV
Mayo Medical School
Rochester, MN

Baseballs, Einstein, AND EMERGENCY MEDICINE

While you probably aren't routinely reflecting on it during a busy day, *physics* actually plays a very overt role in emergency medicine. Think about a baseball's blunt Newtonian force when it causes an orbital wall fracture. Sometimes, though, science is subtler. After all, you can calculate the rate at which to run a patient's infusion without giving much direct thought to Poiseuille's law and the principles of fluid mechanics governing the flow of medication in the patient's IV line. But beyond even the basic principles of physics, it is striking that even advanced physical theory applies to emergency medicine.

Einstein — famous for his theory of relativity, among other scientific contributions — was the first to report on his observation that the motion of an object in space occurs *relative* to a frame of reference, such as the motion of some other reference object in space.¹ For example, to a person standing on a train platform, a baseball thrown in the direction of the train's travel by someone standing on top of a moving train car will appear to move faster than it will to the person atop the car who threw it. In this case, the thrower's frame of reference is the train car, and the viewer's frame of reference is the fixed train platform.

Last year, as part of my third-year pediatrics clerkship, I worked several shifts in the pediatric side of our ED, and I was struck by how quickly the time seemed to pass each shift. Receiving sign-out from everyone covering the previous shift seemed to only just begin before I was already presenting the last patient of my shift to the attending. The passage of time — like the motion of the baseball — is relative as well. In a typical shift, you move speedily between patient rooms, deliver quick-fire presentations, make phone calls, document, and provide patient education, among many other things. All of these activities require mental focus as you switch from task to task. However, an eight-hour shift, for example, lasts the same eight clock hours as would physically tick by if you spent them all watching paint dry. **Hours spent in the ED seem to dissolve to mere minutes relative to most of the other things on which time in life is spent.** Psychologist Mihály Csíkszentmihályi has termed this experience of accelerated time "*flow*."²

It is important to remember, though, that time might not seem to pass by so quickly for everyone in the ED. Patients lying atop their stretchers might wait with their eyes glued to the clock, watching the seconds slowly tick by as they await their lab results. Time goes slowly as they wonder if they're suffering from something benign and can go home, or if that anxious, gnawing feeling in their stomach means that something very bad is at hand. Patients' family members pace the waiting room, repeatedly checking their watches and wondering how soon they will be allowed back to see a loved one; sometimes, they're wondering if their loved one is even alive. For patients and families, this frame of reference is different.

As an expression of how fundamental time is to the specialty, the American Board of Emergency Medicine created a logo depicting an hourglass filling with sand.³ Perhaps it is Einstein's relativity theory that makes time relevant to both the physicians and the patients in emergency medicine. Like a baseball thrown on a train, **time may appear to go faster for us; but for those we are serving, time may be slowly ticking by.** It is important to remember both perspectives and to quickly intervene on behalf of our patients. We may not notice, but they're counting the clock — and they're counting on us. *



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Lightly

In celebration of our 40th anniversary, here are just some of the milestones that demonstrate your organization's success:

1974: EMRA is created in Dallas by Dr. Joseph Waeckerle and friends

1981: EMRA Council is established

1988: We have 1,875 members, and growing

1999: EMRA officially adopts the logo from Dr. Michael Kaufmann's design

2009: EMRA goes high tech and launches Dr. Brian Levine's *ABX Guide* as a mobile app

2013: Former EMRA board member Dr. Steven Stack serves as President-Elect of the American Medical Association and will be the first EM physician to become President of the organization

2014: Membership grows to 12,000 members ...and counting!

Across our entire association, we see a common thread: *EMRA represents the most talented emergency medicine physicians in the practice.* To the patients you serve around the nation, you're heroes. As for us, we couldn't agree more.



FEELING THE **Burn**

What does burnout mean?

Do your feelings of cynicism mean you've lost your heart and soul through the course of medical school?

If, as a resident, you roll your eyes each time a new patient rolls through the door, have you lost all compassion?

Transitioning from your third to fourth year in medical school is significant in many ways because of all its foreshadows. It symbolizes your final year as a student. It means you are about to begin the long (and expensive) process of applying to residency. And it means that this year, Match Day is all about *you!* Similar feelings are had by most students moving into intern year, and for the senior residents preparing for fellowship and attending positions.



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Yet despite all the seemingly positive things on the horizon, you may have become *different* – somehow more complacent about your fate, more cynical towards medicine and the health care system in general. Whether you acknowledge it or not, with these feelings, you’ve become “symptomatic.”

FROM MEDICAL SCHOOL AND ON, WE ARE ALL SUSCEPTIBLE TO THE EFFECTS OF BURNOUT.

Somewhere along my own path through medical school, I seemed to have lost my appreciation for what I was doing. Was it because I was so wrapped up in studying for shelf exams and boards that I forgot I was finally doing what I had always wanted most? Or was it because every time I looked at my student loan account balance, I questioned why I ever chose to go to medical school?

These thoughts plagued me during my third year. One day while doing some light reading, **I came across an article that publicly voiced these feelings:** “The Darkest Year of Medical School,” by Danielle Ofri. The article is about how third-year medical students “come in altruistic and empathetic,” and leave “jaded and bitter.”¹ While I appreciated that the article finally validated my feelings, it did little to answer the essential question of *why*.

About a month later, with only one week between me and the end of third year, I found my answer while listening to an EM:RAP podcast. As I listened to Aaron Bright and Jan Shoenberger discuss career burnout in emergency medicine,² I thought, “This is it!” **Third year was when I, as a medical student, had**

finally experienced burnout. And with the looming pressures of residency interview season requiring me to be at my best, I was even more aware of how burned out I had truly become.

If, while sitting down to compose your personal statement for ERAS, you find yourself having to think back to your first year — or perhaps even to *before* medical school — in order to remember all the compelling reasons that led you to choose this career, then you, my friend, are burned out.

As Dr. Shoenberger outlined in her podcast, **feelings of cynicism are natural components of burnout — a “symptom,” if you will.** Other symptoms include emotional exhaustion, compassion fatigue, depersonalization, and a low sense of personal accomplishment. But these feelings don’t have to last

forever! Although it gets far less attention than career burnout, medical school burnout is a real phenomenon and should be addressed and dealt with appropriately. So to all of you jaded medical students: you’re cynical because you’re burned out — and you have a right to be. In fact, you’ve *earned* it. And now that you’ve identified it, you can move forward. Recognize the issue, take the time to rest, and give your workaholic self a well-deserved break. You may even begin to rediscover the inspiration you once had (just in time for interviews!). For the residents out there feeling the drag of residency, think about why you got into the game and force yourself to take time out of your busy schedule to reconnect with life.

Remember, burnout can occur and return at any level of training and experience, but keeping in mind the principles above will help keep us motivated, compassionate, and inspired by what we do. ★



TIPS TO COMBATING MEDICAL BURNOUT

- 🔥 **RECOGNIZE THAT YOU ARE NOT EXEMPT FROM BURNOUT.** It’s only natural. The seemingly endless years of work and school; sleepless nights; stress; and, of course, regular encounters with terminal disease and death are bound to take a toll.
- 🔥 **POSITIVE REAFFIRMATION.** Take a moment to step back and reflect on the things you’ve accomplished. Recognition of the road you’ve traveled can help give you strength in the present and future.
- 🔥 **TALK TO SOMEONE ABOUT IT.** Fellow students, residents, and attendings have all been in your shoes at some point; they understand and can provide excellent advice.
- 🔥 **MAKE “YOU” TIME.** Whether you feel it or not, your emotional tank could be running low. Take the time to identify the stressors in your life, and recharge by doing the things you love. Touching base with who you are is an excellent way to lift your spirits.
- 🔥 **PAY ATTENTION TO YOUR HEALTH.** Whether it’s exercise, eating healthy, or sleeping in — when you feel healthier, you feel better about yourself.
- 🔥 **BE A LEADER!** Create a committee, pursue a new project, or start a discussion. You can find strength and vitality through service and leadership, and you can help others who have similar priorities.

New Doctors New Choices



Tim Murphy, MSIV
University of Connecticut
School of Medicine
Farmington, CT

During my third-year rotations, I was frequently regaled with stories from senior physicians about their training. Often these tales centered on the ungodly amount of hours they had to work and the sacrifices they had to make to get to where they are today. Inevitably, these stories ended with a lecture on how easy today's medical students have it, and how my generation lacks the dedication shown by those in the past.

This sentiment is not just limited to medicine. In a recent speech, the U.S. Secretary of Education, Arne Duncan, compared American students with those of South Korea and found that we fall far short.¹ He concluded that there were many reasons for this, including his belief that **students and their parents simply aren't as dedicated to their studies as those in previous generations.** This is a cultural problem that I have experienced first-hand while working as a wrestling coach at a local high school. Several students are ineligible to compete because of their grades, mainly because they simply do not do their homework. When asked why they had let their studies slide,

these students are unable to give an answer other than, "I don't like homework." Like Duncan, I find this trend troubling.

As medical students and future physicians, we undoubtedly value education — or else we wouldn't have succeeded in getting into medical school. But Secretary Duncan's speech got me thinking about whether medical students today have the same discipline and work ethic as students in prior generations. It is well-documented that **medical students today want to work less hours and have more flexibility — even if this means less pay.** Senior physicians may perceive this approach as "taking the easy way out." But is this more relaxed work schedule similar to my wrestling students' approach to homework, or is it just a new way of looking at an old situation? And is it necessarily a bad thing for medicine, or will it negatively impact patient care?

While working more hours may lead to more experience and knowledge, it seems there is a limit. Overtired and unhappy physicians are bound to make more mistakes and worsen patient care.

Studies have shown that sleep-deprived workers make more work-related errors.² Should new physicians be forced to work long hours because of tradition and a sense of duty? If new physicians want to voluntarily increase duty hours and can still provide quality patient care, that is their choice — but I think it would be a mistake to expect this from everyone. **Happier physicians deliver better care,** so promoting flexible work schedules can create a win-win situation.

As I look to residency and beyond, I expect and welcome the work that comes with it. A strong work ethic is very important, and it is paramount that I become the best physician I can be by delivering the highest quality of care to my patients. However, I don't think this is incompatible with a balanced lifestyle. Nor do I think that valuing a better work/life balance should be looked down upon. It is an individual's decision and doesn't reflect on his or her dedication to the patient. This isn't bad for the profession; it is merely a change in how medicine is and will be practiced. ★

The delicate work/life balance



Rotting Away

FOURNIER'S GANGRENE

One of the most feared and commonly fatal findings in the perineum



Image 1. Fournier's gangrene involving the penis and scrotum.

Case

An 83-year-old male is dropped off by his caregiver with a chief complaint of shortness of breath and "acting different" for one day. Before turning around and leaving, she also mentions that he has a rash around his groin. Physical exam reveals an ill-kept male in respiratory distress – he's awake, but unresponsive, and the rash in his groin is shown (Image 1). A presumptive diagnosis of Fournier's gangrene with septic shock is made. The patient is intubated and early goal-directed therapy is initiated. CT of the abdomen is obtained (Image 2), showing diffuse free air. Urology is emergently consulted and the patient is taken to the operating room. Sadly, the patient quickly decompensates on the operating table and passes away.

Fournier's Gangrene

Classified as a type 1 necrotizing fasciitis of the perineum, Fournier's gangrene is one of the most feared and commonly fatal findings in the perineum, with a mortality rate ranging between 3 to 38%. Although it can be seen in both genders, it occurs primarily in men between the ages of 20 and 50, and commonly infects the penis and/or the scrotum. Fournier's is typically a polymicrobial infection, including both aerobic and anaerobic bacteria. It is compounded by diabetes, immunocompromised states, and poor nutrition, which are all major risk factors for development of the disease. The most **common factors preceding the development of Fournier's gangrene** are infection or trauma to the perianal area, including anal intercourse, scratches, pressure ulcers, and chemical- or thermal-induced injuries.¹

Symptoms of Fournier's often start with vague abdominal pain or severe itching as the bacteria infect the anterior abdominal wall and then spread to the gluteal muscles, back, perineum, and eventually into the scrotum and penis. Patients will commonly present with nausea and vomiting, changes in mentation, and lethargy, which are usually accompanied by systemic findings, including fever, tachycardia, and hypotension. Sepsis is a common precipitant of Fournier's gangrene. In patients with SIRS and no identifiable source, the perineum should be examined closely for any evidence of infection. Physical exam often reveals somewhat extreme abdominal pain. Skin findings range from tense edema to blisters or bullae, crepitus due to subcutaneous gas, and frank necrosis.

Pathophysiology

As stated, infection is most frequently polymicrobial, consisting of both anaerobic



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and aerobic bacteria. The most common anaerobes are *Bacteroides*, *Clostridium*, or *Peptostreptococcus*, while Group A *Streptococcus* is usually the common aerobic culprit.² Cultures from many cases have demonstrated bacteria from the distal colon, including *Bacteroides fragilis* and *Escherichia coli*, which may be the result of direct perianal trauma. The bacteria commonly infect the muscle fascia and subcutaneous tissues of the perineum, leading to destruction of the small branches of the pudendal arteries that supply the perineal and scrotal skin.

The pudendal arterial tree is the primary blood supply to the perineum; **once it is destroyed, the bacteria can spread quickly throughout the region.** The resulting erythema, edema, inflammation, and infection in a devascularized space provide a prime environment for anaerobic bacterial growth. Muscle and skin have a more prominent blood supply, so the progression is slower through these deeper tissues; but once they are infected, systemic symptoms are more likely to be seen.³

Diagnosis

The symptoms and findings commonly considered and previously mentioned as typical for Fournier’s gangrene are usually present at the advanced stages, but early infection may only present with localized redness. Resultantly, necrotizing infection should be on the differential for any rapidly spreading erythema. Another potential pitfall is that, due to the amount of perineal swelling and pain distribution, Fournier’s may be mistaken for a strangulated hernia. Any presence of perineal gangrenous tissue, subcutaneous air, or crepitance should make the clinical diagnosis. Labs for septic

shock, including a blood gas with lactate and blood cultures, should be sent immediately. Although the diagnosis is frequently obtained clinically, CT or MRI of the infected area can provide confirmation by showing the appearance of free air in the subcutaneous tissues. When needed, these imaging studies can help to guide management, but **imaging should never delay the necessary treatment – surgical debridement.**

Treatment

Although early goal-directed therapy should be started as soon as gangrene is suspected, the definitive treatment is surgery. Urology or corresponding acute care surgery should be involved in the case as early as possible because source control is essential. Deep debridement down to bleeding viable tissue is required to remove all infected tissue. This can require multiple trips to the OR for complete treatment. Patients with Fournier’s gangrene may require cystostomy, colostomy, or orchiectomy, depending on the tissue involvement.⁴ Antibiotics should be started prior to surgery, but surgery should not be delayed while waiting for them to be prepared. Use of a carbapenem — such as meropenem

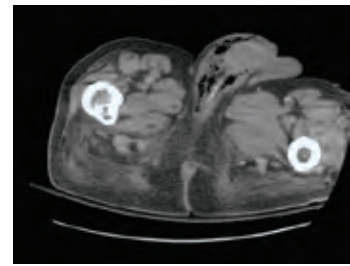


Image 2. CT imaging of the pelvis, revealing free air within the perineum and involving the genitals, consistent with necrotizing disease.

or ertapenem, in addition to clindamycin — should cover the anaerobic bacteria, while coverage for aerobic bacteria should include vancomycin, daptomycin, or linezolid in order to account for potential MRSA co-infection.⁵

Conclusion

Although Fournier’s gangrene is associated with high mortality, a high suspicion can lead to an early diagnosis and increased survival. Early surgical debridement and broad-spectrum antibiotics are the mainstay of treatment, and both are directed by the competent emergency physician who makes the diagnosis. ★

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EMRA 2014

Spring Award Recipients

CONGRATULATIONS TO EMRA'S DESERVING WINNERS!



Top row from left > **Outgoing EMRA Board Member:** former MSGC chair, Zach Jarou, MD, Michigan State University; **Research Grant:** Jason Bowman, Texas A&M University Health Science Center and Jeffrey Chien, MD, Thomas Jefferson University; **Academic Excellence Award:** Nicholas Johnson, MD, University of Pennsylvania; **Jean Hollister EMS Award:** Ryan Gerech, MD, CMTE, University of Cincinnati. *Bottom row from left >* **Dr. Alexandra Greene Medical Student Award:** Zheng Ben Ma, Baylor College of Medicine; **EMRA Resident of the Year:** Tom Becker, MD, University of Michigan; **Residency Director of the Year:** Mark Clark, MD, St. Luke's-Roosevelt Hospital Center; **Chief Resident of the Year:** Neel Naik, MD, NYU/Bellevue Hospital Center; **Assistant Residency Director of the Year:** Charlotte Page Wills, MD, Alameda County/Highland Hospital.

Not pictured > **Chief Residents of the Year:** Meghan Spyres, MD and Ambrose Wong, MD, NYU/Bellevue Hospital Center; **Residency Coordinator of the Year:** Katy Oksuita, University of Wisconsin Hospitals & Clinics; **EMBRs Scholarship:** Rachel Wightman, MD, NYU/Bellevue Hospital; **Teaching Fellowship Scholarship:** Katja Goldflam, MD, Yale School of Medicine; **Local Action Grant:** P. Quincy Moore, MD, Cook County Hospital.

Dr. Klauer earned his medical degree from the University of Osteopathic Medicine and Health Science in 1992, and a law degree from Concord Law School in 2011, where he was a distinguished scholar. He is chief medical officer of Emergency Medicine Physicians (EMP), a national medical group he has served since 1999. He is an board member of EMP Trust and Physicians Specialty Limited Risk Retention (PSLRRG), and is the director of The Center for Emergency Medicine Education. Dr. Klauer has received numerous awards and honors, including the ACEP National Faculty Teaching Award and the EMRA Robert J. Dougherty Teaching Fellowship Award. In addition to his role at ACEP, Dr. Klauer is the co-author of two risk-management books: *Emergency Medicine Bouncebacks: Medical and Legal and Risk Management*, and the *Emergency Department: Executive Leadership for Protecting Patients and Hospitals*. He served on EMRA's board from 1993-1995 during his residency at Louisiana State University, Charity Hospital, in New Orleans.

empower

Sharing Our Stories

Dr. Kevin Klauer

Intrigued by the specialty's variety and potential for dramatic, immediate impact, Dr. Kevin Klauer knew he wanted to pursue a career in emergency medicine early in medical school. Looking for a way to get more involved in the field during residency, he ran for a position on the EMRA Board of Directors, eventually becoming the organization's first-ever secretary and physician editor-in-chief of *EM Resident* magazine. Since then, his impressive career has gone on to include numerous editorial and leadership positions, including esteemed roles as the speaker of the ACEP Council, and medical editor-in-chief of *ACEP Now*. Despite a long list of opportunities and accolades, Dr. Klauer credits his experience with EMRA for setting the stage for his fruitful career.



"Being part of the EMRA board absolutely has influenced everything I've done since. It expanded my frame of reference and gave me the opportunity to interact at a national level — which is an invaluable, but uncommon, experience for a resident," he said. "EMRA exposed me to truly gifted people and gave me the chance to provide input that shaped the thinking of an organization — and in a very broad sense, the entire specialty. The influence that EMRA, which garners a tremendous amount of respect, has over the specialty is dramatic — particularly given the size of the organization. To this day, I think of my position with EMRA as a game-changer in my career."

EMRA Quiz SHOW

Congratulations to the tough, brainy residents who publicly tested their EM knowledge and their mettle at the EMRA Quiz Show at SAEM's Annual Meeting in May. Thirteen superstar teams from across the country showed off their mastery of medical trivia, and Carolinas Medical Center (pictured at left) brought home the title of champion!



Carolinas Medical Center



University of Wisconsin



University of Mississippi



Alameda County Highland Hospital



Boston Medical Center



The Quiz Show emcees, Drs. Jessica Best and Nick Governatori.



Northwestern University



William Beaumont Hospital



University of Washington



Denver Health Center



Brown University



Texas A&M Christus Spohn



Regions Hospital



University of Texas at Austin

EMRA/SAEM

SimWars

University of Kentucky

Once again, the **EMRA/SAEM Simulation Academy Resident SimWars** spurred intense competition at the SAEM Annual Meeting in May. Kudos to our grand champion, the **University of Kentucky** (pictured at left), and the other fierce teams who entertained and educated us with their admirable intelligence, dexterity, and unexpected acting skills!



Hennepin County Medical Center



Washington University in St. Louis



University of Mississippi Medical Center



Stanford University/Kaiser



Carolinas Medical Center



Icahn School of Medicine at Mt. Sinai

Sign up to compete in SimWars at ACEP14 on Oct. 29! Email simwars@gmail.com. Deadline is Sept. 15

2014 CPC Semi-Final Competition Winners

Congratulations to the winners of the **2014 National Emergency Medicine Clinical Pathologic Case Presentation (CPC) Semi-Final Competition**, sponsored by ACEP, CORD, EMRA, and SAEM! The competition was fierce at this year's event, held the 2015 CORD Academic Assembly held in April. Eighty emergency medicine residency programs submitted cases in the preliminary round, which were judged on quality, applicability to emergency medicine, and solvability. Seventy-two of the best cases were chosen for the semi-final competition. Presenting residents were scored on quality, organization, style, and clarity. Competing faculty members were judged on the thoroughness of the differential diagnosis, diagnostic reasoning, and presentation skills. **Stay tuned for more details on the final competition, which will be held at ACEP14 in October.**

DIVISION 1

Resident Presenter Winner:

Kaisia Gore, MD, Advocate Christ Hospital

Faculty Discussant Winner:

Jorge Fernandez, MD, University of California, San Diego

Resident Presenter Runner-up:

Jeff Hall, DO, University of Nevada

Faculty Discussant Runner-up:

Jason Becker, MD, Albert Einstein Medical Center

DIVISION 2

Resident Presenter Winner:

Michael Jackson, MD, Naval Medical Center Portsmouth

Faculty Discussant Winner:

John Devlin, MD, Naval Medical Center Portsmouth

Resident Presenter Runner-up:

Glenn Fernandez, MD, LSU Shreveport

Faculty Discussant Runner-up:

Steve Johnson, MD, Lehigh Valley Health Network

DIVISION 3

Resident Presenter Winner:

Charmaine Lieu, MD, Alpert Medical School of Brown University

Faculty Discussant Winner:

May Li, MD, Beth Israel Medical Center

Resident Presenter Runner-up:

Paul Discepola, MD, Beth Israel Medical Center

Faculty Discussant Runner-up:

Robin Naples, MD, Temple University

DIVISION 4

Resident Presenter Winner:

Cassidy Dahn, MD, Boston Medical Center

Faculty Discussant Winner:

Ryan Bodkin, MD, University of Rochester Strong Memorial Hospital

Resident Presenter Runner-up:

Antonio (Aaron) Rodriguez, MD, University of Rochester Strong Memorial Hospital

Faculty Discussant Runner-up:

Chad Branecki, MD, University of Nebraska

DIVISION 5

Resident Presenter Winner:

Dominick Maggio, MD, Alameda County Medical Center/ Highland General Hospital

Faculty Discussant Winner:

Charlotte Wills, MD, Alameda County Medical Center/Highland General Hospital

Resident Presenter Runner-up:

Kristen Peace, MD, Albany Medical Center

Faculty Discussant Runner-up:

Tina Choudhri, MD, George Washington University

DIVISION 6

Resident Presenter Winner:

Neil Kathuria, MD, St. Luke's-Roosevelt Hospital

Faculty Discussant Winner:

Evelyn Kim, MD, Oregon Health & Science University

Resident Presenter Runner-up:

Jim Skiba, MD, MPH, University of Michigan

Faculty Discussant Runner-up: Erik Kochert, MD, York Hospital



Pain Medicine Certification Approved for Emergency Physicians

In April 2014, the Board of Directors of the American Board of Medical Specialties (ABMS) approved the American Board of Emergency Medicine (ABEM) joining the American Board of Anesthesiology (ABA), the American Board of Physical Medicine and Rehabilitation (ABPMR), and the American Board of Psychiatry and Neurology (ABPN), in offering certification in pain medicine. This co-sponsorship provides an opportunity for emergency medicine residency graduates to pursue fellowship training in pain medicine, and upon successful completion of that training, seek subspecialty certification in pain medicine through ABEM.

More than 70% of patients who come to the ED have a chief complaint of some type of pain, and at least 40% have an underlying pain condition. The presence of subspecialty experts in EM will help to promulgate the science and practice of pain medicine throughout the specialty of EM.

ABEM president, James H. Jones, MD, stated that, "Pain medicine is a rapidly expanding area of interest, practice, and research within EM, and is a natural

extension of our specialty. Our patients will directly benefit as this subspecialty grows and matures. This adds to the opportunities available for subspecialty certification provided by ABEM."

To be able to take the subspecialty certification examination, ABEM diplomates must have successfully completed a one-year, ACGME-accredited pain medicine fellowship program. They also must adhere to the ABEM Policy on Medical Licensure, hold a valid ABEM certificate, and be participating in the ABEM MOC program. Those who fulfill all requirements may apply to ABEM to take the examination. The eligibility criteria and application are available on the ABEM website (abem.org).

Pain medicine becomes the ninth subspecialty available to ABEM-certified physicians along with anesthesiology, critical care medicine, emergency medical services, hospice and palliative medicine, internal medicine—critical care medicine, medical toxicology, pediatric emergency medicine, sports medicine, and undersea and hyperbaric medicine.

What's the Diagnosis?

CASE 1

The Patient



A 5-year-old healthy circumcised male presents to the emergency department in July complaining of swelling to the penile shaft just proximal to the glans. The swelling was noticed when he awoke this morning. There is moderate pruritus, no trauma, and the pain is minimal. The patient is able to void without any difficulty. The family reveals they had been sitting in the grass for several hours watching fireworks the previous evening, but no other pertinent history is provided. Examination findings are seen in the photograph. Several erythematous papules are seen throughout the genitourinary area.

What is the diagnosis?

CASE 2

The Patient



A 13-year-old healthy uncircumcised male presents to the emergency department in the morning, complaining of severe pain to the shaft of his penis, just proximal to the glands. There is no history of trauma. The patient did retract his foreskin last night during a shower to clean his glans. He cannot recall if he replaced his foreskin after his hygienic maneuver. He is able to void, but with some difficulty. There is no pruritus or fever. Examination findings are seen in the photograph.

What is the diagnosis?

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See the
DIAGNOSIS
on page 48

The Diagnosis

CASE 1

The Diagnosis

The patient has summer penile syndrome. Summer penile syndrome (SPS) is a seasonal acute hypersensitivity reaction of the penis due to chigger bites. Clinical findings include pruritus, dysuria, chigger mite exposure, swelling, erythema, and excoriations of the penile shaft. Duration of symptoms with treatment is typically 3-5 days, but may last up to 2 weeks. Treatment includes systemic antihistamines and cool compresses. Be sure the patient is able to void. Severe local reactions may appear similar to cellulitis and may be difficult to differentiate from infection. Other diagnoses to consider include paraphimosis, balanitis, balanoposthitis, and phimosis.

CASE 2

The Diagnosis

Similar in appearance to SPS, but very different, this patient is presenting with paraphimosis. A paraphimosis occurs when the retracted foreskin of an uncircumcised male becomes edematous due to lymphatic and venous congestion, which does not allow it to return to its normal position. Ongoing edema may cause progressive constriction of the penile shaft and restrict blood flow to the glans, resulting in ischemia and permanent damage. This is in contradistinction to phimosis, a condition where the foreskin cannot be fully retracted over the glans. Immediate reduction of the paraphimosis is necessary once identified.

The decision on who should perform the initial attempt at reduction depends on the degree of ischemia to the glans. If blue or black, urology should be called immediately to perform the reduction, otherwise the emergency physician should attempt it as soon as possible.

Reduction of a paraphimosis typically requires intravenous narcotics and/or sedation during the procedure. Manual circumferential compression for 5-10 minutes followed by manual reduction is the preferred initial ED method. Ice, compression bandages, osmotic agents (topical granulated sugar, 50% dextrose soaked gauze) are adjuncts to decrease the swelling, but may take several hours to work. If the emergency physician is unable to reduce the paraphimosis, urology should be consulted for potential surgical release. ★

UPCOMING EVENTS



EMRA Fall Representative Council Resolutions
Deadline



EMRA Board of Directors Candidate Application
Deadline



ACEP14
Chicago, IL



Emergency Medicine Basic Research Skills (EMBRs) Workshop
Dallas, TX



ABEM Qualifying Exams
Nationwide



EMRA Spring Awards
Deadline



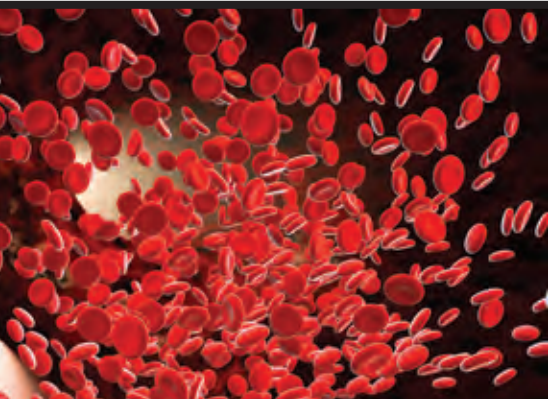
BOARD REVIEW+

QUESTIONS

For a complete reference and answer explanation for the questions below, please visit www.emra.org.

Provided by PEER VIII. PEER (*Physician's Evaluation and Educational Review in Emergency Medicine*) is ACEP's Gold Standard in self-assessment and educational review. These questions are from the latest edition of *PEER-PEER VIII*, which made its debut at ACEP's 2011 Scientific Assembly. To learn more about PEER VIII or to order it, go to www.acep.org/bookstore.

- Which of the following statements correctly differentiates small-volume hemoptysis from hematemesis?
 - Hematemesis is accompanied by bile
 - Hematemesis is dark red and alkaline
 - Hemoptysis is accompanied by mucus
 - Hemoptysis is bright red and alkaline
- A 43-year-old man presents after one episode of bloody emesis. He first had multiple episodes of forceful vomiting and diarrhea after eating at a new Chinese restaurant. He has had no further emesis and otherwise appears well, and he has no significant past medical history. What is the most likely diagnosis?
 - Boerhaave syndrome
 - Esophageal varices
 - Gastritis
 - Mallory-Weiss syndrome
- Which of the following injuries can be safely repaired by an emergency physician?
 - 0.5-cm lower eyelid laceration at the medial canthus
 - 1-cm horizontal upper eyelid laceration with a small area of exposed fat
 - Lower eyelid laceration with a small area of avulsed tissue
 - Oblique, partial-thickness laceration of the upper eyelid
- A 55-year-old woman presents with shortness of breath that has worsened over the past several weeks and is worse during exertion and at night. Which of the following clusters of radiographic findings is most characteristic of cardiogenic pulmonary edema?
 - Cardiomegaly, Kerley B lines, and pulmonary venous redistribution
 - Cephalization, Kerley A lines, and widened mediastinum
 - Hampton hump, fluid in the minor fissure, and bat-wing infiltrates
 - Interstitial infiltrates, pleural effusion, and Westermark sign
- Which of the following causative organisms of pneumonia is also associated with rash and bullous myringitis?
 - Bordetella pertussis*
 - Legionella pneumophila*
 - Mycoplasma pneumoniae*
 - Yersinia pestis*



RISK MANAGEMENT PITFALLS FOR NOVEL ORAL ANTICOAGULANT AGENTS



From the October 2013 issue of *Emergency Medicine Practice*, “Emergency Department Management of Patients on Novel Oral Anticoagulant Agents.” Reprinted with permission. To access your EMRA member benefit of free online access to all *EM Practice*, *Pediatric EM Practice*, and *EM Practice Guidelines Update* issues, go to www.ebmedicine.net/emra, call 1-800-249-5770, or email ebm@ebmedicine.net.

1 “I didn’t think I needed to order coagulation studies.”

Obtain coagulation studies in patients with suspicion for major bleeding who are taking NOACs or whose medication history is unclear. This information may help to guide management as well as to identify the causative agent in an obtunded patient.

2 “I didn’t think that I needed to recheck coagulation studies after treating the patient.”

Remember to recheck coagulopathy studies 30 minutes after the administration of PCC or 30 minutes after the administration of FEIBA to determine the need for additional doses.

3 “She didn’t appear to be at an elevated risk for thrombosis.”

Consider the baseline risk of thrombosis due to medical comorbidities (including malignancy or thrombophilia) before administering PCC or FEIBA, or for patients aged >65 years receiving rFVIIa.

4 “We always give fresh frozen plasma for coagulopathy.”

Aggressively administering fresh frozen plasma when PCC is available (and is the preferred treatment) can lead to slower

reversal, unnecessary volume overload, and respiratory failure.

5 “We gave charcoal, and then he started to vomit.”

Remember to perform endotracheal intubation prior to administration of activated charcoal in patients with recent overdose of NOACs who are at an elevated risk for alterations in mental status, vomiting, or aspiration. Video laryngoscopy improves first-pass success in these patients who may be at an elevated risk for bleeding during intubation.

6 “I didn’t think that I needed to document the discussion of risks regarding NOAC reversal.”

The use of reversal agents is associated with an increased risk of thromboembolic complications; therefore, always discuss the risks and benefits with patients and their families and document the discussions regarding risks and benefits of using this treatment. Document that the patients and/or family understood and were in agreement with their use.

7 “He was neurologically intact and his head CT was negative, so I discharged him to home.”

We do not yet know how the risk of delayed intracranial hemorrhage

with the NOACs compares to traditional anticoagulants or antiplatelet agents. Provide your patients with a good follow-up plan and return precautions.

8 “I didn’t remember how to dose the reversal agent when it came time to administer it.”

Written protocols can facilitate care, especially when related to lifesaving interventions that are infrequently used. Proactively establish protocols with other specialties (pharmacy, blood bank, hematology) to promote management efficiency and improved patient outcomes.

9 “I didn’t think I needed to administer the guaiac stool test on her.”

Patients on dabigatran are at an elevated risk for gastrointestinal bleeding, even beyond that conferred with warfarin use. Have a high suspicion for bleeding in patients taking NOACs.

10 “His FAST examination was negative.”

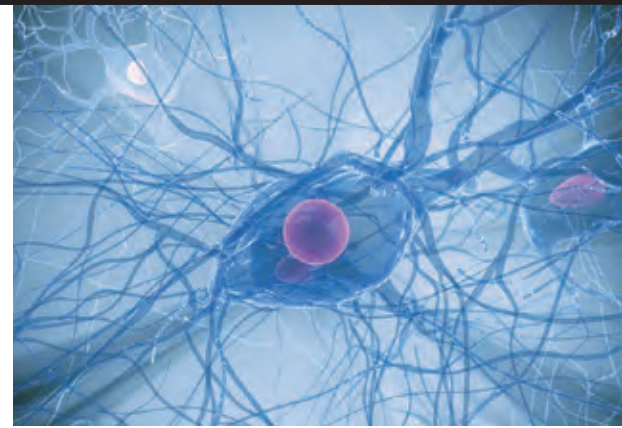
Patients on NOACs who sustain trauma can have delayed bleeding, so serial examinations and repeat FAST examinations should be performed, with a low threshold for consideration of CT imaging if they deteriorate. ★

RISK MANAGEMENT PITFALLS

PEDIATRIC NERVE BLOCKS



From the October 2013 issue of *Pediatric Emergency Medicine Practice*, “Pediatric Nerve Blocks: An Evidence-Based Approach.” Reprinted with permission. To access your EMRA member benefit of free online access to all EM Practice, Pediatric EM Practice, and EM Practice Guidelines Update issues, go to www.ebmedicine.net/emra, call 1-800-249-5770, or email ebm@ebmedicine.net.



- 1** “The child wouldn’t tolerate the block procedure.”
Children may not tolerate procedures due to high anxiety levels. Utilizing a child life specialist, distraction techniques, or anxiolytics may help the child tolerate the procedure.
- 2** “I couldn’t tell if the nerve was properly blocked because the child couldn’t communicate.”
There are a variety of behavioral response assessments and pain scales that can help determine whether the patient is feeling discomfort or if the block has successfully anesthetized the area.
- 3** “I wasn’t sure of the correct method for the nerve block, so I decided to try local infiltration instead.”
Taking the time to review the techniques for nerve blocks can potentially decrease the amount of anesthetic used, the time required to anesthetize the area, and the distortion caused by local infiltration.
- 4** “I sedated the girl with a femur fracture for portable radiographs because she couldn’t tolerate the manipulation.”
Sedating a patient will not guarantee decreased pain with manipulation; however, a nerve block will anesthetize the area and allow for more appropriate imaging of an
- awake and alert patient in the radiology suite without the antecedent risks of procedural sedation. The duration of nerve blocks may also allow subsequent repair with a single dose of anesthetic compared to possible repeat doses of sedating medications.
- 5** “I decided to use lidocaine without epinephrine because it had a lower dose and therefore posed less risk of toxicity.”
Epinephrine is recommended because it will allow for vasoconstriction in the area and a longer duration of anesthetic. If there is a dosing concern, then the concentration of anesthetic should be lowered and a nerve block should be considered.
- 6** “I didn’t do a nerve block because I was afraid I would puncture a vessel and cause further damage.”
While it is possible to puncture a vessel while performing a nerve block, simple pressure to the area will create hemostasis and the procedure can be attempted again. Using ultrasound may assist in avoiding vessels and may decrease the rate of complications.
- 7** “Using the ultrasound machine requires too many hands. I did the nerve block by landmarks alone.”
If there are no available personnel to assist in the procedure, simply reviewing the anatomy of the area with ultrasound may assist in the initial placement and direction of your needle.
- 8** “I didn’t do a nerve block because they have a high risk for causing permanent nerve damage.”
Done properly, nerve blocks have a low rate of complications and can successfully produce analgesia and anesthesia.
- 9** “Nerve blocks can only be used for laceration repair.”
Nerve blocks can be successfully used in the management of many types of injuries, including fracture and dislocation reduction, foreign body removal, incision and drainage of abscesses, and wound management.
- 10** “I tried to ‘spread out’ the maximum dose of anesthetic via local infiltration to repair this wound.”
Inadequate analgesia caused by “spreading out” local infiltration can make proper injury repair more difficult. A smaller dose of anesthetic used in a nerve block can produce adequate anesthesia to aid in wound management. ★

Don't Miss These Important EMRA Events at **ACEP14 Scientific Assembly**

Anxious, eager and enthusiastic residents and medical students attend these important events to explore their next steps in emergency medicine.

ABSOLUTE 'DON'T MISS' EVENTS!



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Monday, October 27

Looking for that perfect job?

EMRA is here to help! Don't miss the largest and best Job Fair in the specialty of emergency medicine! With more than 150 companies expected to participate in this year's event, you are bound to find the job that is just right for you.

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Sunday, October 26

Do you know where you want to match?

Scout out more than 100 residency programs from around the country at the EMRA Residency Fair. Medical students cannot afford to miss this terrific opportunity to network with program directors, coordinators, and chief residents.



CALLING ALL EXHIBITORS!

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For exhibitor information on EMRA's 2014 Job or Residency Fairs in Chicago, please contact Leah Stefanini at lstefanini@emra.org or call 866-566-2492 x3298.

Visit www.emra.org for more details.

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SUBMIT**A LETTER TO THE EDITOR ▶**

EM Resident welcomes and encourages letters to the editor submitted to emresidenteditor@emra.org.

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PRODUCTION MATERIALS

DIGITAL AD SPECIFICATIONS

High-resolution PDF formatted ads are preferred and may be emailed. If ads were designed in a page layout program, please send an EPS version (FTP available).

Other acceptable formats:

- TIF (300 DPI; CMYK)
- EPS (300 DPI; CMYK)
- JPG (300 DPI at 100% or larger print size)
- AI (embed images; text; CMYK)

* If an ad is submitted in its native application program, all images and fonts will also need to be submitted **OR** all text converted to outlines and all images 'embedded'.

- * PDF files with embedded fonts and graphics at 300 DPI (resolution) will be accepted.
- * All images must be 300 DPI (resolution).
- * MS Word files are **not** acceptable as final display ads, however typesetting services are available at an additional charge of \$100.
- * Web graphics are **unacceptable** (resolution is too low) and will be discarded.
- * EMRA is available to assist in the production of your advertisement.

ADVERTISING DEADLINES

Issue	Space	Art
Dec/Jan	11-1	11-10
Feb/Mar	1-1	1-10
Apr/May	3-1	3-10
Jun/Jul	5-1	5-10
Aug/Sept	7-1	7-10
Oct/Nov*	9-1	9-10

ACEP Scientific Assembly issue: deadline subject to change based on meeting schedule.

Questions? Contact Leah Stefanini at 866-566-2492 x3298 | or email lstefanini@emra.org

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Cottonwood and Sedona: Verde Valley Medical Center in Cottonwood and Sedona are state-of-the-art facilities seeing approximately 24,000 and 7,000 emergency patients respectively per year. Situated in a beautiful, scenic area in North Central Arizona, Cottonwood combines the charm and friendliness of a small community with easy access to the metropolitan areas of Phoenix and Las Vegas and the charming college town of Flagstaff. Sedona is a beautiful tourist community located in Arizona's "Red Rock Country;" this outdoor paradise is surrounded by mountains, forests, creeks and rivers. Partnership opportunities are available for Emergency Medicine residency-trained and Board-Certified Physicians. EMP offers democratic governance, open books and equal equity ownership. Compensation package includes performance bonuses and comprehensive benefits with funded pension (additional 13.27%), CME account (\$8,000/yr.), and more. Contact Bernhard Beltran directly at 800-359-9117 or e-mail bbeltran@emp.com.

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Those interested in a position or further information may contact Dr. Hoxhaj via email hoxhaj@bcm.edu or by phone at 713-873-2626.

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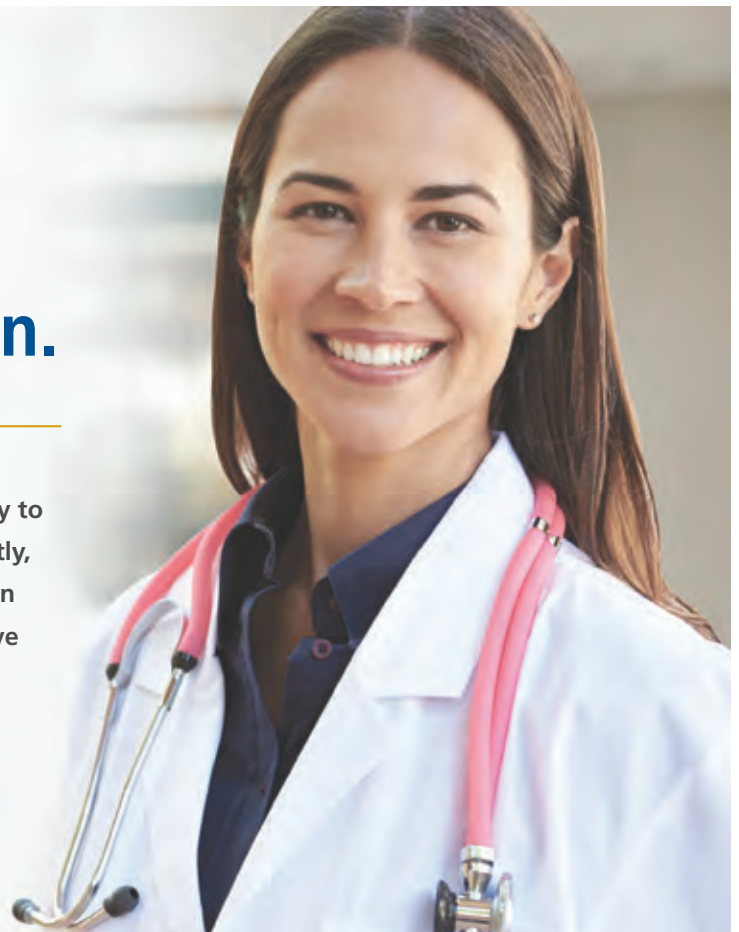
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Chicago Heights/Olympia Fields and Kankakee: EMP manages EDs at several community teaching hospitals seeing 29,000 – 40,000 pts./yr., with trauma center designations and EM residency teaching options. Positions are currently available at Franciscan St. James Health (2 campuses seeing 34,000 and 40,000 pts./yr.) and Presence St. Mary's Hospital (29,000 pts./yr.). We are an exclusively physician owned/managed group with open books, equal voting,

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NEW YORK

Albany area: Albany Memorial Hospital has a newer ED that sees 44,000 pts/yr. and hosts EM resident rotations. Samaritan Hospital in Troy is a respected community hospital, minutes from Albany, which also treats 45,000 ED pts/yr. Outstanding partnership opportunity includes equal profit sharing, equity ownership, funded pension, open books, full benefits and more. Contact Ann Benson, (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd, NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

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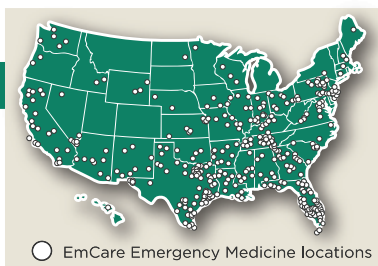


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NORTH CAROLINA



Eastern Region: EMERGENCY MEDICINE FACULTY. Clinician-Educator / Clinician-Researcher / Pediatric Emergency Medicine / Ultrasound: The Department of Emergency Medicine at East Carolina University Brody School of Medicine seeks BC/BP emergency physicians and pediatric emergency physicians for tenure or clinical track positions at the rank of assistant professor or above, depending on qualifications. We are expanding our faculty to increase our cadre of clinician-educators and further develop programs in pediatric EM, ultrasound, and clinical research. Our current faculty members possess diverse interests and expertise leading to extensive state and national-level involvement. The emergency medicine residency is well-established and includes 12 EM and 2 EM/IM residents per year. We treat more than 120,000 patients per year in a state-of-the-art ED at Vidant Medical Center. VMC is a 960+ bed level 1 trauma center and regional stroke center. Our tertiary care catchment area includes more than 1.5 million people in eastern North Carolina, many of whom arrive via our integrated mobile critical care and air medical service. Our new children's ED opened in July 2012, and a new children's hospital opened in June 2013. Greenville, NC is a fast-growing university community located near beautiful North Carolina beaches. Cultural and recreational opportunities are abundant. Compensation is competitive and commensurate with qualifications; excellent fringe benefits are provided. Successful applicants will be board certified or prepared in Emergency Medicine or Pediatric Emergency Medicine. They will possess outstanding clinical and teaching skills and qualify for appropriate privileges from ECU Physicians and VMC. **Confidential inquiry may be made to: Theodore Delbridge, MD, MPH, Chair, Department of Emergency Medicine, delbridget@ecu.edu.** ECU is an EEO/AA employer and accommodates individuals with disabilities. Applicants must comply with the Immigration Reform and Control Act. Proper documentation of identity and employability required at the time of employment. Current references must be provided upon request. **www.ecu.edu/ecuem • 252-744-1418**

Charlotte: EMP is partnered with eight community hospitals and free-standing EDs in Charlotte, Lincolnton, Huntersville and Statesville. A variety of opportunities are available in urban, suburban and smaller town settings with EDs seeing 10,000 - 79,000+ pts./yr. EMP is an exclusively physician owned/managed group with open books, equal voting, equal equity ownership, funded pension, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

Morehead City: Modern community hospital on the Atlantic coast minutes from Atlantic Beach! This 135-bed facility sees 39,000 emergency pts./yr. and is active in EMS. Outstanding partnership opportunity includes equal profit sharing, equity ownership, funded pension, open books, full benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

New Bern: Respected 313-bed regional medical center located at the intersection of the Trent and Neuse Rivers just off the central coast, 70,000 ED pts./yr. Outstanding partnership opportunity includes



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OHIO

Cincinnati: Mercy Hospital-Anderson is located in a desirable suburban community and has been named a "100 Top Hospital" ten times. A great place to work with excellent support, the renovated ED sees 43,000 emergency pts./yr. Outstanding partnership opportunity includes performance pay, equal equity ownership, equal voting, funded pension, open books, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

Columbus: Doctors Hospital is host to an award winning osteopathic emergency medicine residency training program where 79,000 ED patients are treated annually. Outstanding partnership opportunity includes performance pay, equal equity ownership, equal voting, funded pension, open books, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.



The Department of Emergency Medicine of the University of Rochester Medical Center has open **Emergency Medicine Faculty positions** for work at our primary academic site, as well as our community affiliates and our free-standing emergency department.

Seeking Faculty positions in:

- Academic Faculty Positions
- Regional & Community Faculty Positions
- Regional Medical Director

Our Department includes a well regarded EM Residency Program, Research and Fellowship programs. Our main site, Strong Memorial Hospital, is the regional referral and trauma center.

We are seeking BC/BP candidates with dynamic personalities who are interested in a diverse Emergency Medicine experience with great potential for career development, promotion, and career longevity within our department. With these sites, there is also ample opportunity to become involved in academics and administration.

Rochester, New York is located in upstate New York offers excellent schools, low cost of living, many opportunities both professionally and personally, and easy access to Canada, including metropolitan Toronto and the northeast United States.

Interested applicants please contact:
Michael Kamali, MD, FACEP
Chair, Department of Emergency Medicine
Michael_kamali@urmc.rochester.edu
585-463-2970

Concord, Madison and Willoughby: INCREASED PAY and LOAN REPAYMENT PROGRAM! Lake Health is situated in the eastern Cleveland Suburbs. TriPoint Medical Center was built in 2009 and treats 31,000 emergency pts./yr. The Madison Medical Campus hosts a freestanding ED seeing 12,000 pts./yr. West Medical Center is a state-of-the-art acute care hospital serving 37,000 ED pts./yr. Outstanding partnership opportunity includes \$60,000 bonus/loan repayment, performance pay, equal equity ownership, equal voting, funded pension (\$34,500/yr.), open books, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.



Northeastern Ohio: Physicians Emergency Services, Inc. is a progressive, single hospital, independent democratic group seeking another board-prepared physician to join its team. The hospital is located in Ravenna and has a 22 Bed ED with electronic medical record system. Annual census is 37,000. Competitive salary. Excellent benefit package. Equal shareholder at 2 years. Nine and ten-hour shifts rotate amongst all physicians except two existing physicians work exclusively nights. ED Physician coverage is 37 hours per day and PA/NP coverage 24-36 hours per day. A description of some of our practice advantages along with a more detailed summary of our salary and benefit package is available. For more information please contact Brian Adams, MD, FACEP at 440-864-4242 or by email at phys_app@pesmed.com.

Parma: INCREASED PAY and LOAN REPAYMENT PROGRAM! University Hospitals Parma Medical Center is situated in the SW Cleveland suburbs. State-of-the-art physical plant and equipment serve 44,000 patients per year. Outstanding partnership opportunity physician owned/managed group with open books, equal voting, equal equity ownership, funded pension (13.27% in addition to pay), CME/expense account (\$8,000/yr.) plus comprehensive health benefits and more, including \$60,000 loan repayment/bonus. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

Springfield: INCREASED PAY and LOAN REPAYMENT PROGRAM! Springfield Regional Medical Center is a brand new, full-service hospital with supportive, new administration committed to emergency medicine, is 45 miles west of Columbus and 25 miles northeast of Dayton, 75,000 emergency patients are treated annually. EMP is an exclusively physician owned/managed group with open books, equal voting, equal equity ownership, funded pension (13.27% in addition to pay), CME/expense account (\$8,000/yr.) plus comprehensive health benefits and more, including \$60,000 loan repayment/bonus. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

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Interested?

Nicholas Jouriles, MD

Chair, Emergency Medicine, Akron General Medical Center
Professor and Chair, Emergency Medicine, Northeast Ohio Medical University
Past President, American College of Emergency Physicians

Nick.Jouriles@akrongeneral.org

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WEXNER MEDICAL CENTER

AN OUTSTANDING OPPORTUNITY for up to four new physician faculty positions at The Ohio State University Wexner Medical Center, in Columbus, Ohio, exists today. With an expanded, new, and innovative emergency department, residency program and all the resources of one of the nation's largest universities on one campus, incredible clinical, educational, and research opportunities exist for high quality faculty. A \$1.1 BILLION expansion of the clinical footprint will open a new ED in July 2014. Two of these new positions will be research intensive and two will be more traditional faculty tracks, with an emphasis on educational innovation and translation. This increase in faculty contingent is necessary to grow the clinical and academic missions of OSU and commensurate resources are made available to candidates with sufficient track records and skills. Qualified candidates available (minimum requirements are Board Prepared/Board Certified Emergency Medicine residency graduate with strong academic credentials) within an abbreviated timeline will find greater flexibility to meet their career expectations. Individuals from diverse backgrounds are encouraged to apply.

Please send a communication of intent to
Thomas Terndrup, MD, Professor and Chair
Thomas.terndrup@osumc.edu
Department of Emergency Medicine
The Ohio State University Wexner Medical Center
or, to mary-jayne.fortney@osumc.edu
Phone: **614-293-8176**. AAEOE

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Urbana: Mercy Memorial Hospital services the SW Ohio region's residents in Champaign County, the facility treats approximately 18,000 emergency pts./yr. EMP is an exclusively physician owned/managed group with open books, equal voting, equal equity ownership, funded pension, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

OKLAHOMA



Various Cities – Full and Part-Time Emergency Physician opportunities in Clinton, Durant, Madill, Pryor, and Seminole. **Moonlighting opportunities for qualified Residents - 2nd and 3rd year encouraged to apply.** At Hospital Physician Partners you will also enjoy competitive compensation, paid malpractice with tail, flexible scheduling, free and discounted CME, and a clinically led leadership team. For more information please contact **Mark Hyde at 800-815-8377, Ext 5553, email mhyde@hpartners.com.**

Tulsa: Brand new, state-of-the-art, 85-room ED to open in 2014! Saint Francis Hospital is a modern 971-bed regional tertiary care center seeing 96,000 ED patients per year, with broad pathology, high acuity, modern facilities and supportive environment. Outstanding partnership opportunity includes equal profit sharing, equity ownership, funded pension, open books, full benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

PENNSYLVANIA

Pittsburgh and suburbs, Canonsburg, Connellsville, New Castle and Erie: Allegheny Health Network and Emergency Medicine Physicians are pleased to announce the formation of Allegheny Health Network Emergency Medicine Management (AHNEMM), which offers a professional arrangement unlike that previously available in the region. Equal equity ownership/partnership, equal profit sharing and equal voting will now be available to the emergency physicians at Allegheny General Hospital in Pittsburgh, Allegheny Valley Hospital in Natrona Heights, Canonsburg Hospital in Canonsburg, Forbes Regional Hospital in Monroeville, Highlands Hospital in Connellsville, Jameson Hospital in New Castle, and Saint Vincent Hospital in Erie. Comprehensive compensation package includes performance bonuses, funded pension (13.27% in addition to gross earnings), CME/business expense account (\$8,000/yr.), family health/dental/vision plan, occurrence malpractice (all physician partners own the company and share in its success), short and long-term disability, life insurance, 401k, flex spending program, and more. Contact Jim Nicholas (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

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New Castle: Jameson Hospital is a respected facility situated between Pittsburgh, PA and Youngstown, OH, with easy access to the amenities and residential options of each. Recent major renovation includes a brand-new ED with 30 private rooms; 36,000 emergency patients are treated per year. EMP offers outstanding partnership opportunity including performance pay, equal equity ownership, funded pension, open books, comprehensive benefits and more. Contact Jim Nicholas (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

Sharon: Sharon Regional Health System has an extremely supportive administration/medical staff, newer ED, and full service capabilities making this a great place to work with 37,000 patients treated annually. Small city setting offers beautiful housing and abundant recreation less than an hour from Pittsburgh and Cleveland. Outstanding partnership opportunity includes equal profit sharing, equity ownership, funded pension, open books, full benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

RHODE ISLAND

Westerly: The Westerly Hospital is a 125-bed community hospital situated in a beautiful beach community in SE RI, 45 minutes from Providence and 1.5 hours from Boston. Modern, well-equipped ED sees 26,000 pts./yr. Outstanding partnership opportunity includes performance pay, equal equity ownership, funded pension, open books, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

WEST VIRGINIA

Wheeling: Ohio Valley Medical Center is a 250-bed community teaching hospital with an AOA approved Osteopathic EM and EM/IM residency program. Enjoy teaching opportunities, full-specialty back up, active EMS, and two campuses seeing 27,000 and 20,000 pts./yr. Outstanding partnership opportunity includes performance pay, equal equity ownership, funded pension, open books, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

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PRESBYTERIAN

Albuquerque, NM

Presbyterian Healthcare Services (PHS) is New Mexico's largest, private, non-profit healthcare system and named one of the "Top Ten Healthcare Systems in America." Over 600 providers are employed by PHS and represent almost every specialty. PHS is seeking BE/BC Emergency Medicine trained physicians to work in our Emergency Medicine department. Our physicians enjoy a flexible work schedule and compensated for working nights. This is an employed opportunity with Presbyterian Medical Group, part of Presbyterian Health Services. The Emergency Medicine group covers three Presbyterian Hospitals in Albuquerque including Presbyterian Hospital, Kaseman Hospital and Rust Medical Center. The hospitals have 65,000, 40,000 and 24,000 ED visits per year, respectively. Our ED group is comprised of 45+ physicians, 12 mid-levels and additional support staff. At Presbyterian Hospital, we have over 50 rooms broken into 4 pods. Navigators triage non emergent patients to our lean track or makes next day appointments for those not needing immediate care. We have 24x7 hospitalists admitting ED patients.

Enjoy over 300 days of sunshine, a multi-cultural environment and the casual southwestern lifestyle. Albuquerque has been recognized as "One of the Top Five Cities to Live." It is also home to University of New Mexico, a world class university.

These opportunities offer a very competitive salary, sign on bonus, relocation; CME allowance; 403(b) w/contribution and match; 457(b); health, life, AD&D, disability ins, life; dental; vision; pre-tax health and child care spending accounts, occurrence type malpractice ins, etc. EOE.

For more information contact Kelly Herrera, PHS, PO Box 26666, Albuquerque, NM 87125; kherrera@phs.org; 505-923-5662

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Contact: Richard M. Cantor, MD FAAP/FACEP
Professor of Emergency Medicine and Pediatrics
Director, Pediatric Emergency Department
Medical Director, Upstate Poison Control Center
Upstate Medical University, 750 East Adams Street, Syracuse, NY 13210
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