

EM Resident

Official Publication of the Emergency Medicine Residents' Association

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Building Allies

Solving Cases
Using ultrasound

Globetrotting
Travel medicine



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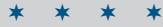
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The Emergency Medicine Residents' Association is the voice of emergency medicine physicians-in-training and the future of our specialty.



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NEED HELP?

Tools for Tackling Stressful Transitions



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Growing up, summer's approach led to a multitude of emotions — excitement about a break from school; sleeping in; perhaps going on vacation; or fun at the pool, beach, camp, and so on. For medical students or residents, however, June and July can bring on an entirely different set of feelings.

For medical students, **you may have anxiety as you enter a new year of education.** Perhaps you're shifting from the classroom to the clinical setting. If you are in your clinical years, you may be getting ready to apply for an emergency medicine residency, or you might be making the huge transition to residency — both can be exciting and intimidating at the same time.

Residents experience a similar shift. Interns are thrown into the role they've been daydreaming about; junior residents become senior residents; and all across the board, roles and responsibilities advance. Senior residents may be trying to hone their skills while preparing to enter a fellowship or stepping into an attending role. For a large portion of grads, though, the **ultimate shift is about to come** — from resident-in-training to an independently practicing emergency physician.

Let EMRA help with the next step in your career

Medical student resources

Preparation is essential when applying for a residency in emergency medicine, and you've likely already planned ahead for home and away rotations. A volume of resources is available at emra.org to help you shine while in the emergency department and prepare you for the months and years ahead. EMRA's *Medical Student Survival Guide* is available for FREE as a PDF download found under our publications tab (www.emra.org/publications/books), and there are many other educational and advising resources located on their own dedicated pages (www.emra.org/students/educational-resources, www.emra.org/students/advising-resources).

EMRA's "Reading Recommendations" page provides a wealth of information, including a proposed timeline of activities during medical school, letters of recommendation, residency applications, and interviews. This section of the website is really pertinent to **all** EMRA members, as it also provides phenomenal resources regarding wellness and career planning. Check it out at www.emra.org/students/education/reading-recommendations.

Resident resources

July brings long, hot days, celebratory BBQs — and the new batch of interns. While actually putting your medical degree to work is an exciting step up in your career, it comes with a certain level of trepidation — and that doesn't usually go away after your first shift. Fortunately, everyone has been there, and EMRA has many educational resources to help you both during and after your clinical duties. Check out emra.org to take advantage of the books, blogs, apps, reference cards, and other resources, many of which are

FREE with your membership. Also **keep an eye out for your EMRA Welcome Kit**, which provides lots of supplies and more information to get you started.

For the junior resident moving into a more senior role, you likely have different concerns. Perhaps you are now responsible for teaching medical students or junior residents. If that's the case, then you should **check out the FREE PDF download Resident as Educator handbook** on EMRA's website (www.emra.org/publications/books). Maybe you're looking to get more involved and find your niche within emergency medicine. If so, head to the website to check out EMRA's Committees and Divisions, as well as many other opportunities.

If you're entering your last year of residency, as crazy as it sounds, you are likely already thinking about your upcoming job search. The organization offers many career-planning resources (www.emra.org/resources/career-

PRESIDENT'S MESSAGE

For a large portion of grads, the ultimate shift is about to come – from resident-in-training to an independently practicing emergency physician.

planning), as well as links to EM Career Central, which provides current, searchable job listings. It's not too early to start spiffing up your CV and making connections; this will help you enjoy more of the remainder of your time in training.

Life after residency

But what if you already have a fellowship or job lined up, and you started the countdown to your first day of work long ago? What does EMRA have to offer? **Plenty!**

First of all, you're not quite done yet. You still have to take your boards — and **the earlier the better** (data shows higher pass rates the earlier you take the exam). Clearly, this is easier said than done, but EMRA has resources available online to help you navigate the process and determine the best study plan for you

(www.emra.org/resources/preparing-for-the-boards).

So now that you're done with residency, you're done with EMRA, right? **Wrong!** You should strongly consider becoming an **EMRA alumni member**. This portion of our membership is constantly growing — your \$50 dues go a long way. Check out www.emra.org/benefits/alumni to learn more.

For most of you residents preparing for graduation, it is likely that your programs have been renewing and paying for your professional society memberships. Now that you are entering the world of work, you may be responsible for these dues directly, or through coordination with your group. Hopefully you have taken full advantage of your professional society memberships as a resident, and

recognize the value of continuing them throughout your career. If not, or if you hesitate to hand over your well-deserved compensation for a higher-priced attending membership — I encourage you to evaluate all that professional society membership has to offer. It certainly varies in what people find most attractive — educational meetings, publications, advocacy, camaraderie, representation — but chances are there is an organization that is a good fit for you, and will offer a great return on your investment.

While daunting, the transitions we make in our medical careers are important and necessary steps; and we are there with you on this exciting journey. EMRA has a multitude of resources to help you navigate your way — hopefully making the process a bit less stressful, and freeing up some time for summer fun. *

EMERGENCY MEDICINE RESIDENTS' ASSOCIATION

Plan Your Transition Now!



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Just for Emergency Medicine Residents

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Lessons from the road

Finding humility, a servant's heart, and the ability to smile through adversity.

I still feels like yesterday when I wrote my farewell to residency. Since then I have worked countless hours as an attending in both community and academic settings. Between innumerable intubations, multiple septic patients, three precipitous deliveries, and an ever-so-memorable cricothyrotomy, my world has expanded beyond what I ever thought possible at the end of those short years in residency. Even with so many experiences, all the lessons I have learned so far can be summarized in one sentence: make friends — lots of them. The surgeons, the chief nursing officer, the scribes, the techs, the nurses, the janitors, the podiatrists — bring them all into your camp.

Do not underestimate how isolated emergency medicine doctors can be from the other medical staff. We work in teams, work very strange and varied hours, have little time for lunch, and often do not wear white coats. Without making an effort, it is easy to miss out on connections within the physician network. More than socially discouraging, the truth is that **the life of your patient may one day depend on this rich potential informal network of remembered favors and allegiances.** For example, I make sure to introduce myself to the cardiologist eating a sandwich alone at the cafeteria on a Sunday night. I ask about how her

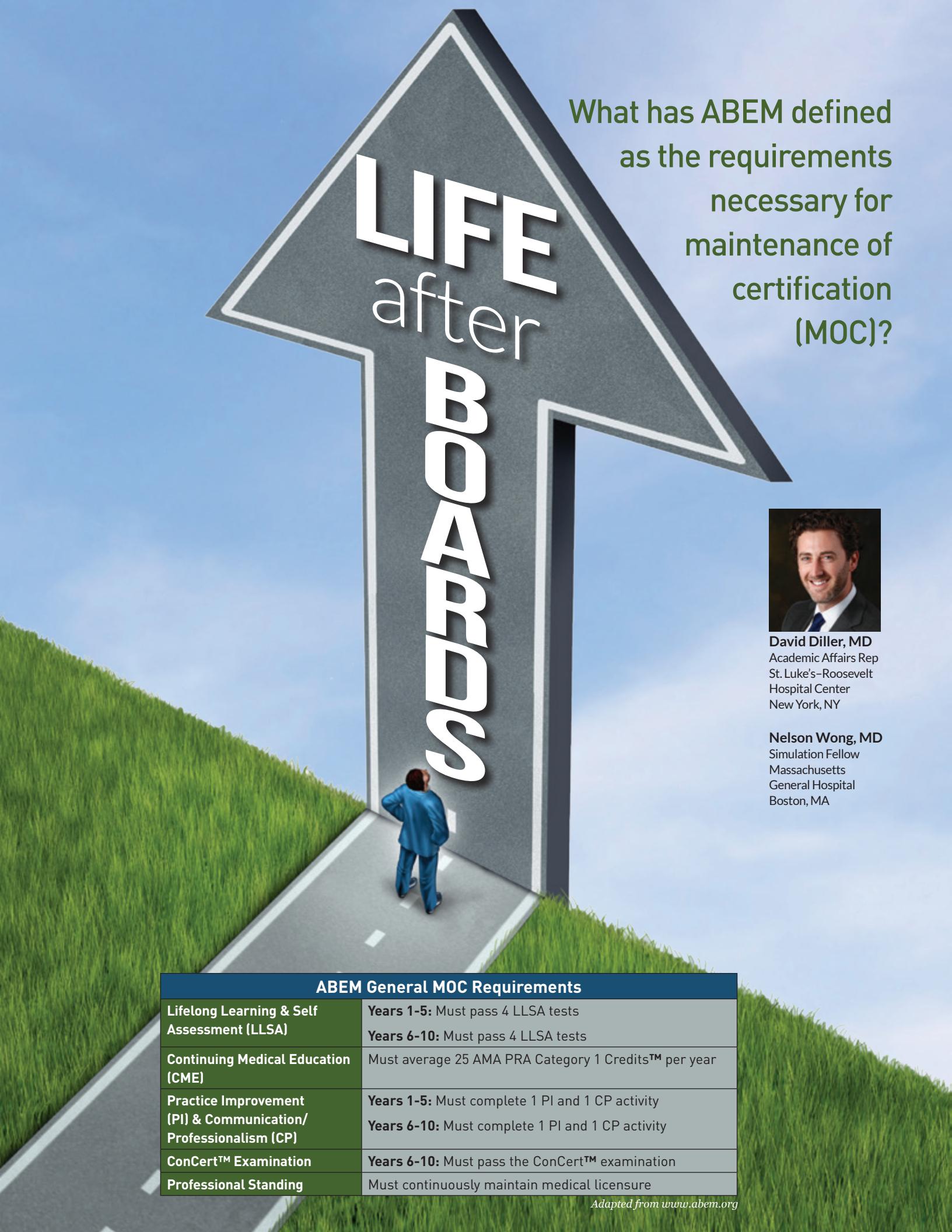
call is going, ask about any exciting cath lab cases, and then joke about keeping the ED quiet. When that 3 a.m. STEMI rolls in and I would like a quick set of eyes on the EKG, things go more smoothly; "Dr. Jones, I saw you at the cafeteria yesterday and we had a great conversation about aVR and left main disease. Can I fax you an EKG, and ask you to take a quick second look?" There is instant recognition, instant connection, and a friendly voice on the other end.

Part of being friends is helping. Offer to place a central line for a patient with poor access to help out the ICU physician; make the extra call to save your hospitalist doing it at 3 a.m.; offer to place a Quinton for dialysis access in the patient with a severe aspirin overdose. This is not to say that you should not delegate responsibility or let other physicians do their assigned tasks, but you should work exceptionally hard to create lasting bonds so, in turn, they will willingly go above the call of duty to take care of your patients when in need.

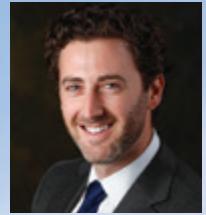
One of the greatest downfalls of new graduates is to misjudge how much patient care depends on non-physician staff. While we make medical diagnoses and perform life-saving interventions, **the nursing and ancillary staff are the heart and**

soul of patient care. If you do not make friends with them, you do so at your own peril. In a busy community hospital, it is not uncommon to have multiple codes at the same time; your success as a physician will depend on the amount of trust and rapport that you have built with your nursing staff. Just like with your physician colleagues, make sure that you help every member of your team to ensure that the ED runs smoothly — get blankets for patients, start your own IV lines, place a Foley while your nurse is at lunch. **Your efforts will be remembered, and the staff will have more of an investment in the team with you as its leader.**

Finally, the lessons include finding humility, a servant's heart, and the ability to smile through adversity. It has been a great year since residency, with many demands, but lots of growth. It has certainly been made easier with my trusty **EMRA apps and pocket guides, and with continuing education in the form of EMRA-sponsored podcasts.** We all have a lot to look forward to as we progress in our careers from resident to attending, although we should expect some bumps and delays along the way. But, if we continue to pursue lasting professional relationships and personal education, the road will be a lot smoother. *



What has ABEM defined
as the requirements
necessary for
maintenance of
certification
(MOC)?



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ABEM General MOC Requirements

| | |
|--|---|
| Lifelong Learning & Self Assessment (LLSA) | Years 1-5: Must pass 4 LLSA tests Years 6-10: Must pass 4 LLSA tests |
| Continuing Medical Education (CME) | Must average 25 AMA PRA Category 1 Credits™ per year |
| Practice Improvement (PI) & Communication/Professionalism (CP) | Years 1-5: Must complete 1 PI and 1 CP activity Years 6-10: Must complete 1 PI and 1 CP activity |
| ConCert™ Examination | Years 6-10: Must pass the ConCert™ examination |
| Professional Standing | Must continuously maintain medical licensure |

Interview

Whether you are a first-year medical student or a graduating senior resident, standardized testing has undoubtedly been a significant hurdle in your career. Most of us probably recognize that, in order to become “board-certified” in emergency medicine upon completion of residency training, we need to successfully pass both the American Board of Emergency Medicine (ABEM) qualifying and oral examinations. Yet, few know what happens after achieving board certification status. What has ABEM defined as the requirements necessary for maintenance of certification (MOC)? What is the allotted time period to complete these required activities? To help address these questions, we enlisted the help of current ABEM president, James H. Jones, MD.

We would like to thank Dr. James Jones, Dr. Rebecca Smith-Coggins, and Dr. Earl Reisdorff of ABEM for their time in helping us understand what is needed to maintain our hard-earned board-certified status. More information can be found at www.abem.org. *

How would you describe the MOC process for residents, and what do the various parts of the MOC represent?

The ABEM MOC Program is a pathway for emergency physicians to be engaged in continuous professional development that is relevant to the practice of emergency medicine and adheres to a national standard. Every medical specialty board under the purview of the American Board of Medical Specialties (AMBS) must have a MOC program that contains professional standing (a medical license requirement), lifelong learning and self-assessment (LLSA), continuing medical education (CME) requirements, engagement in performance improvement and improving the patient encounter (patient communication), and a secure examination that assesses diagnostic reasoning and the assessment of knowledge application to clinical scenarios (the Continuous Certification examination, or ConCert™ exam).

There are a number of different requirements necessary for MOC.

How long do I have to complete these?

Certification is a lifelong commitment, not a single event after residency. As soon as you are certified (after passing the oral examination), you are automatically enrolled in the ABEM MOC Program. The MOC cycle consists of two five-year periods. Requirements must be completed during the five-year window, and the ConCert™ exam must be passed in the second five-year MOC cycle (essentially every 10 years).

Many attending physicians talk about CME credit. How many CME credits are necessary for MOC, what qualifies as valid CME, and how do I submit and keep track of my CME credits?

ABEM requires physicians to complete 25 credits of AMA PRA Category 1 CME every year (on average). Physicians routinely track their own CME, which is largely required for state medical licensure and hospital credentialing. At this time, physicians only need to attest to meeting this requirement — they do not need to submit proof of completing CME unless they are being verified by ABEM.

Are there any other requirements necessary for MOC?

Most physicians have no difficulty meeting the professional standing requirements. Nonetheless, there are a few details about the requirement that might be important to some physicians. In order to be ABEM-certified, you must have at least one current, active, valid, full, unqualified, and unrestricted medical license in the U.S., a U.S. territory, or Canada. In addition, every license that you possess from every state in which you hold a license must be unqualified and unrestricted.

ABEM-certified physicians must be involved in measuring and improving their practice. In most cases, measures already used in the emergency department will meet the ABEM requirement. Physicians attest to completing these activities on the ABEM website.

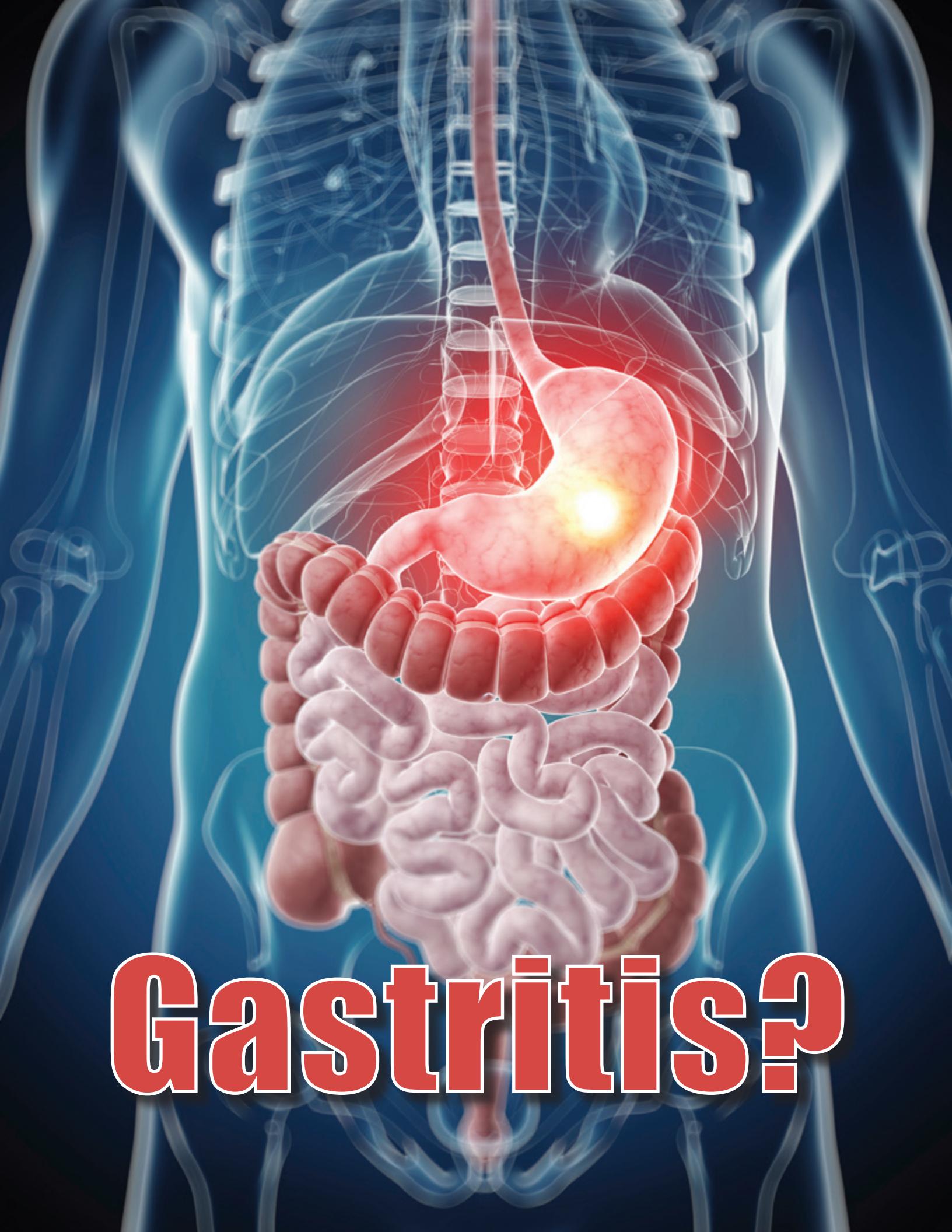
ABEM requires that you be involved in an assessment of the patient experience of care. This is almost universally met by being involved in some type of patient satisfaction process or survey. If your emergency department does not do this, you can download a free, validated survey form from the ABEM website. Physicians attest that they participate in an acceptable communication/professionalism activity. *

What are the lifelong learning and self-assessment tests, and what is the time period required to pass them?

The LLSA tests are based on a series of articles selected by ABEM from submissions by members of the EM community. After reading the articles, physicians take a 20-30 question open-book test. ABEM suggests that this can be done in a group setting. It's much like having a national, specialty-based journal club. ABEM-certified physicians must pass four LLSA tests every five years. They do not need to pass a specific year's LLSA test in that year. Each LLSA test is available online for three years.

What is the ConCert™ examination and when should I take it?

The ConCert™ examination is a secure, computer-based examination, delivered at testing centers across the nation. You must pass the ConCert™ exam in the second five-year period of your MOC cycle (essentially every 10 years). ABEM suggests that physicians take the ConCert™ exam during years eight or nine in the certification cycle. If you take it the final year and do not pass, you could become decertified. There is no downside to taking the ConCert™ one to two years earlier than the expiration date on your certificate.



Gastritis?

Think Twice.

Clinical case

A 31-year-old female presents with severe intermittent epigastric abdominal pain. She reports that this pain began 3 weeks ago and has slowly increased to 10/10 in severity. For the past two days, she had nausea and non-bloody, non-bilious vomiting. Her history includes anxiety, depression, and gastritis. A recent endoscopy performed by her gastroenterologist showed evidence of gastritis, and she is taking lansoprazole daily without relief. She is noted to be slightly tachycardic at 103 bpm, and has mild epigastric tenderness. Initial blood work is within normal limits. After one GI cocktail and multiple rounds of dilaudid did not ease her pain, a contrasted CT scan was performed. This showed acute mesenteric ischemia secondary to extensive thrombus formation in the portal, superior mesenteric, and splenic veins (Figure 1). She is admitted to the surgical intensive care unit, where further laboratory studies reveal a protein S level of less than 10%, and a diagnosis of protein S deficiency is made.

Introduction

Gastritis is a common diagnosis in the ED and can have many presentations, including colicky epigastric pain. While much less common, portomesenteric venous thrombosis often presents with similar symptoms. **This is a diagnosis that should not be missed**, since it requires very different therapy and the acute outcomes are much worse. **A comprehension of abdominal venous anatomy is key to understanding the danger of the disease.** Because the portal vein is formed by the confluence of the splenic and superior mesenteric veins, thrombosis can extend into these venous pathways, and, in turn, can cause acute ischemia. The potential for misdiagnosing a patient with these clinical presentations is high, which creates a huge risk for the patient. We can greatly improve clinical outcomes if we're attentive to the clinical situation, and more willing to consider a broader differential.

Discussion

Acute mesenteric ischemia can have multiple causes. Approximately 95% of cases are due to arterial occlusion, which can be secondary to thrombotic or embolic events.¹ The remaining 5% is due mostly to venous occlusion, specifically portomesenteric venous thrombosis.¹

The etiology of portomesenteric venous thrombosis can be best categorized

into 3 types: **local, inherited, and acquired.** Local risk factors cause inflammation in the abdomen, such as pancreatitis, diverticulitis, appendicitis, and inflammatory bowel disease.² These are typically more apparent with an underlying thrombophilia.¹ Inherited risk factors include thrombophilias, such as factor V leiden and protein S and C deficiencies. The incidence of venous thrombosis is 0.5 to 1.65% per year in patients with protein S deficiency.³ There are a multitude of acquired risk factors which can cause thrombosis, the most common being liver cirrhosis. Other major acquired factors include abdominal surgery, immobilization, pregnancy, and the use of oral contraceptives.

The diagnosis of portomesenteric venous thrombosis is based on high clinical suspicion, since it can so easily masquerade as other more benign conditions. **Taking a thorough history is very important.** Specifically, a past medical or family history of deep vein thrombosis or pulmonary embolism is present in about 50% of patients with portomesenteric venous thrombosis.⁴ Clinically, these patients can present in a variety of ways, depending on the extent of venous obstruction and rate of thrombus development.

Patients with acute portal vein thrombosis can sometimes have silent presentations, with their thrombosis incidentally

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discovered on CT scan for other reasons. In these cases, there can often be some diagnostic uncertainty. Sometimes a repeat contrast-enhanced CT scan of the abdomen can help differentiate the thrombus from the vessel wall.⁵ Otherwise, these patients are typically symptomatic, and usually present with fever, dyspepsia, or abdominal pain, which can be either sudden, or progressive over weeks.² When the thrombus extends to the superior mesenteric vein, the abdominal pain is often reported to be "colicky," and associated with diarrhea.² If there is further expansion into the mesenteric venous arches, ischemia can occur, and will lead to bowel infarction. CT may reveal thickening of the intestinal wall, lack of mucosal enhancement, or intramural gas. These findings all are suggestive of bowel infarction, which may lead to severe sepsis and sometimes septic shock (Figure 2).² **A CT scan is the diagnostic test of choice for suspected cases of portomesenteric venous thrombosis.**

Physical findings appear to be less useful for making a diagnosis. They do not explain mesenteric ischemia of arterial or venous origin very well.⁵ There may be some distension of the abdomen or perhaps guarding, but no one physical exam finding correlates well with a diagnosis of portomesenteric venous thrombosis.⁶

CLINICAL CASE

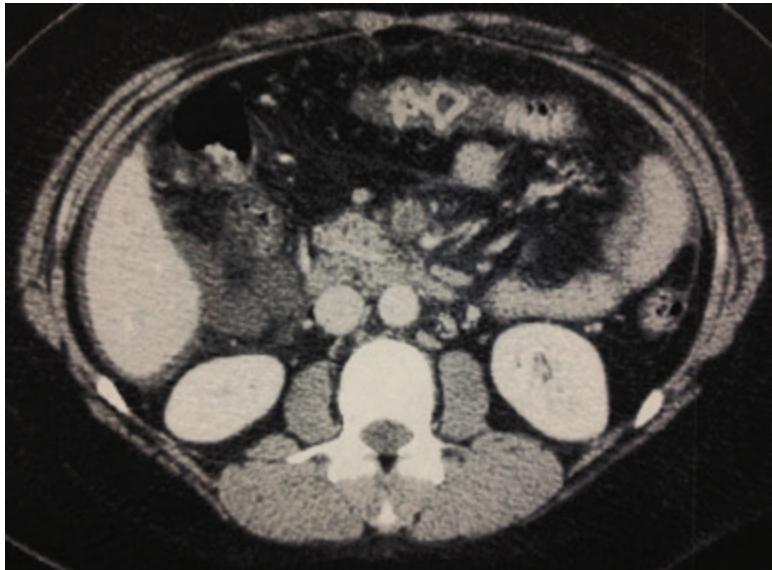


Figure 1.

Contrast-enhanced computed tomography imaging of the abdomen shows superior mesenteric vein occlusion, extended from the portal vein.



Figure 2.

Computed tomography imaging of the abdomen shows thickening of the bowel indicating ischemia, with stranding and fluid in the mesentery.

The diagnosis of portomesenteric venous thrombosis is based on high clinical suspicion, since it can so easily masquerade as other more benign conditions.

Laboratory testing may be a little more helpful. Tests may show elevated levels of acute phase reactants, including c-reactive protein, serum amyloid A, and complement factors. Lactates may be normal in the early stages of thrombosis, but can be very helpful if the level is high, and may indicate bowel ischemia. Liver function tests are typically normal, since hepatic arterial blood flow can compensate for the decreased portal inflow. Patients with bowel infarction may have signs of metabolic acidosis, leukocytosis, or hemoconcentration that can lead to an elevated hematocrit.

Therapy

The primary therapy for acute portomesenteric thrombosis is anticoagulation, which prevents extension of the thrombus and ideally prevents infarction of the bowel. Initially, **unfractionated heparin or low-molecular-weight heparin can be used to quickly achieve therapeutic anticoagulation levels.** Therapeutic unfractionated heparin may be preferred, since it only needs to be stopped four hours prior to surgery, compared with low molecular weight heparin, which is usually held 24 hours prior to operative interventions.³ Heparin treatment can be resumed 24 hours after the procedure.

Once stabilized, treatment can shift to oral anticoagulation, and should be continued for 6 to 12 months.⁶ Lifelong anticoagulation is suggested if prothrombotic risk factors are present. In one study, a high rate of recanalization of the portomesenteric veins was achieved in 25 out of 31 patients (80.6%) when anticoagulation was started at time of presentation.⁷ **If the patient develops transmural necrosis or bowel perforation, urgent surgical intervention will be needed.** For patients with thrombophilia undergoing surgical interventions for venous thrombosis, the perioperative risk of new thromboembolic events is very high; management of these patients should involve the surgical team, and a clear discussion should be had with the patient.

Conclusion

The differential diagnosis of the patient in this scenario was potentially quite broad. However, her history of gastritis being treated with a PPI, a common presentation, and recent endoscopy make it easy to anchor to the wrong conclusion. But, instead of a relatively benign “stomach upset,” **this patient had a potentially lethal underlying disease process — protein S deficiency with thrombosis.** If the diagnosis had been missed, her outcome easily could have been much different. Luckily for her, she did not require any operative management, and conservative therapeutic heparin was successful. Taking a minute to think twice before diagnosing a patient with common gastritis may yield surprising live-saving results *

Small Doses **BIG RESULTS**



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Case 1

A 37-year-old female arrives to the emergency department after a high-speed motor vehicle collision. A traction splint is applied to an open mid-shaft femur fracture. Vital signs: BP 105/76, HR 137, RR 28, O₂ 100%. She is screaming in pain. IVFs are bolused; morphine 4 mg, **and** ketamine 10 mg IV are administered. Within 5 minutes, her pain has improved significantly.

Case 2

A 22-year-old male with Crohn's disease presents complaining of severe abdominal pain. He has had multiple past ED visits with similar complaints, and often receives multiple rounds of hydromorphone. After he is examined, hydromorphone 1 mg IV is given. After 30 minutes, the patient requests additional pain medicine. This time, ketamine 15 mg IV is given. Ten minutes later, the patient reports that his pain has completely resolved.

Discussion

Opioids are some of the most commonly used medications for acute pain in the emergency department. Despite their widespread use, they can present several challenges.



Acutely, hemodynamic or respiratory compromise limits opioid administration and complicates efforts to achieve effective analgesia in painful conditions.

Chronic opioid users experience opioid tolerance and opioid-induced hyperanalgesia, which render opioids less efficacious in treating episodes of acute pain.

Ketamine is a drug with a fairly novel mechanism of action that has been used in a wide variety of settings as an anesthetic.

When used at lower doses, it can act as a potent analgesic. **While ketamine's role as an analgesic in the ED is still somewhat unclear, it has several potential advantages.**

Unlike opioids, sub-dissociative doses of ketamine typically do not cause respiratory depression, hemodynamic compromise, or sedation.¹ In patients who have tenuous hemodynamics, ketamine may provide a safer alternative to other analgesics.

Ketamine has a promising role in an emergency physician's analgesic armamentarium.

Ketamine's multi-modal mechanism of action offers another potential benefit.

Traditionally, ketamine has been described as an N-methyl-D-aspartate (NMDA) receptor antagonist; however, recent research has revealed that it likely works on a number of pathways, including stimulating opioid receptors and blocking serotonin uptake. These varied mechanisms of action have the potential of providing analgesia by altering pain pathways that are not affected by other analgesics.²

To treat acute pain, ketamine is given at a sub-dissociative dose of 0.1-0.3 mg/kg IV.³ This dose is much lower than the typical procedural sedation dose of 1 mg/kg. It has been proposed to start with a bolus of 0.1-0.3 mg/kg given over 10 minutes. The duration of action is relatively short (5-15 minutes), so repeat bolus doses can be given if needed. Alternatively, an infusion can be provided at 0.1-0.3 mg/kg/hr.⁴ Towards the higher end of sub-dissociative dosing, patients may report some altered sensorium, but should not experience any significant amount of sedation. When used in this sub-dissociative range, **ketamine is not considered a sedative, and patients do not need the level of monitoring required by procedural sedation.**^{3,5,6}

Ketamine's role as an analgesic has been studied and utilized in the perioperative setting, burn units, pain clinics, and palliative care settings.^{5,6} Until recently, little data has described its role in treating acute pain in the ED.³ While ketamine may have a role as a sole analgesic, the majority of the literature to date has evaluated its role as an adjunct to traditional analgesics.

In the pre-hospital setting, **patients who received ketamine in addition to morphine reported superior analgesia when compared to patients who only received morphine.**

Jennings, et al. compared pre-hospital trauma patients who were treated with morphine to a group who received both morphine and ketamine.⁷ Patients in the morphine group had a pain reduction score of 2.4 (on a 10-point scale), while those in the ketamine group had a reduction of 5.6 points.

Ahern, et al. evaluated adult ED patients with severe pain.⁸ A wide range of chief complaints were enrolled, including abdominal pain, back pain, malignancy, sickle cell pain, and fractures. Patients were initially given 0.5 mg IV of hydromorphone and 15 mg IV of ketamine. Patients could receive additional hydromorphone doses as needed. The median starting pain score was 9/10; yet after receiving ketamine and hydromorphone, 14/30 patients reported complete pain relief at five minutes. When offered additional doses of hydromorphone, only 20% of the patients needed more than one additional dose.

In this study group, 24 of the patients reported that they experienced some dissociative side effect; however, more than 70% of these patients described their symptoms as "weak or modest." Only four of the patients described these symptoms as bothersome, and **90% of the patients reported that they would receive**

the ketamine-hydromorphone combination again. There were no significant adverse cardiopulmonary events noted in the study group.

Emerging data suggests that ketamine can help provide analgesia for patients who have exacerbations of chronic pain. Uprety, et al. evaluated patients who presented with acute sickle cell pain crisis.⁹ They received ketamine in addition to opioids. **Roughly 80% of patients who received ketamine had an improvement in self-reported pain intensity**, and had a significant reduction in their opioid usage. In patients with chronic pain or who take opioids regularly, ketamine may be a viable alternative to sole reliance on opioids for symptom management.^{9,10}

Ketamine has a promising role in an emergency physician's analgesic armamentarium. With a unique mechanism of action, **ketamine works synergistically with opioids and shows promise in providing analgesia for patients with both acute and chronic pain.** While there is a significant rate of minor emergence phenomena, sub-dissociative ketamine has a broad safety profile with a very low risk of respiratory or hemodynamic compromise. While further studies are needed to further clarify the potential benefits of low dose ketamine, it appears to be a safe and viable option to treat pain in the emergency department.*

SUBMIT

A LETTER TO THE EDITOR ►



The RRC reviewed 32 programs and accredited two new core EM programs, six EMS fellowship programs, and one pediatric EM fellowship program.



The state of the Specialty

I have now completed attendance at my third Residency Review Committee (RRC) meeting. I again ventured from Florida to Chicago for a jam-packed agenda. As you may know, the major task of the RRC is to review both core and subspecialty emergency medicine programs for accreditation. Each application for accreditation or continued accreditation is 100-200 pages in length with dizzying complex language that I'm just now beginning to understand. My more senior colleagues at the end of their six-year terms (my term is two years) can almost recite the program requirements for the core programs verbatim. All-in-all, the RRC reviewed 32 programs,

and I am pleased to announce the new accreditation of two core EM programs, six EMS fellowship programs, and one pediatric EM fellowship program (*Table 1*).

While our responsibilities primarily include reviewing programs and providing guidance on the education requirements for all ACGME-accredited emergency medicine programs, the RRC also coordinates with the American College of Emergency Physicians (ACEP) and the American Board of Emergency Medicine (ABEM). At our last meeting, we heard from our ACEP and ABEM liaisons, who provided updates from their respective fields and relayed data regarding our subspecialties.

ABEM's executive director reported that of the 31,154 ABEM diplomates, 1,283 (4.1%) currently hold an ABEM-issued subspecialty certificate. So, in what are our colleagues specializing? **Table 2 shows where we are now.** With the expansion of critical care training options for EM and the recent accreditation of EMS as a subspecialty, I predict a major jump in these fields over the next several years that will easily eclipse the number of medical toxicology specialists.

Table 1. Newly Accredited Programs
University TN Memphis (EM Core)
University TN Murfreesboro (EM Core)
University Arizona (EMS)
University of Southern California (EMS)
UCSD (EMS)
Indiana University (EMS)
EMS Brown University (EMS)
University TN Chattanooga (EMS)
University Texas at Houston (Peds/EM)

This trend will take the lead for fellowship-trained emergency physicians.

Emergency medical services

The first EMS certification examination was given to 350 candidates in October 2013; 204 passed (58.3%). **Of note, fellowship training was associated with passing the examination.**

Critical care medicine

On October 9, 2013, the second administration by the American Board of Internal Medicine (ABIM) of the Internal Medicine CCM (IM-CCM) certification examination for ABEM diplomates took place. There were 19 ABEM diplomates who took the examination; all 19 passed. To date, 44 ABEM diplomates have taken this examination, and all 44 have passed.

ABEM is now a co-sponsor with the American Board of Anesthesiology (ABA) for certification in Anesthesiology Critical Care Medicine (ACCM). Emergency physicians entering ACCM fellowships are required to complete 24 months of training. There are about 10 programs that are approved by the ABA to accept

ACCREDITATION UPDATE

emergency physicians (check the ABA website for a comprehensive list).

Clinical ultrasonography

ABEM is pursuing subspecialty certification in clinical ultrasonography; expect more to come on this in the future.

An alert for the PGY1s and medical students – **the emergency medicine in-training examination will be administered in 2016** in both paper and computer-based formats. Deciding which programs receive paper exams and which receive electronic exams has not yet been completely established. The final bit of good news from ABEM is that in the upcoming year, there will not be an increase in examination fees; for now, ABEM is holding fees steady.

ACEP Academic Affairs Committee (AAC) update

This committee is spearheading ACEP's focus on GME funding with the goal of identifying GME issues and advocacy solutions, including ascertaining the value of GME and the effect of health care reform on GME funding. The EM model is currently undergoing a revision for 2015. In collaboration with other organizations in our specialty, **EMRA has been**

asked to develop recommendations regarding inclusion of integrated models of care and transitions of care between the ED and primary care.

We also discussed the impact of the RAND report, which revealed that approximately half of all hospital admissions come through the ED. This was followed by ACEP's promotion of the *Choosing Wisely* campaign, which encourages proper resource utilization and evidence-based medicine for decisions like CT head for mild traumatic brain injury, urinary catheters for "convenience," and PO rehydration methods, just to name a few.

When I left the RRC meeting and returned to Florida, not only was I cheered by the balmy weather, but **I was also inspired to do more**. Our specialty is doing great things, and continues to push the boundaries and break down barriers that were present just 5 or 10 years ago. And I've got a feeling that **the best is yet to come**.

Loose ends

In previous years, the RRC met in September and February, but will be transitioning to a June/January schedule to fulfill a Next Accreditation System (NAS) requirement. I love hearing from you! If

Table 2. Number of Subspecialty Certificates

| | | |
|----------------------------------|-----|---------------------------|
| Anesthesiology CCM: | 0 | (first exam in 2014) |
| Emergency Medical Services: | 195 | |
| Hospice and Palliative Medicine: | 94 | |
| Internal Medicine CCM: | 44 | |
| Medical Toxicology: | 356 | |
| Pediatric Emergency Medicine: | 264 | |
| Sports Medicine: | 142 | |
| Undersea & Hyperbaric Medicine: | 188 | |
| Pain Medicine: | 5 | (not an ABEM certificate) |

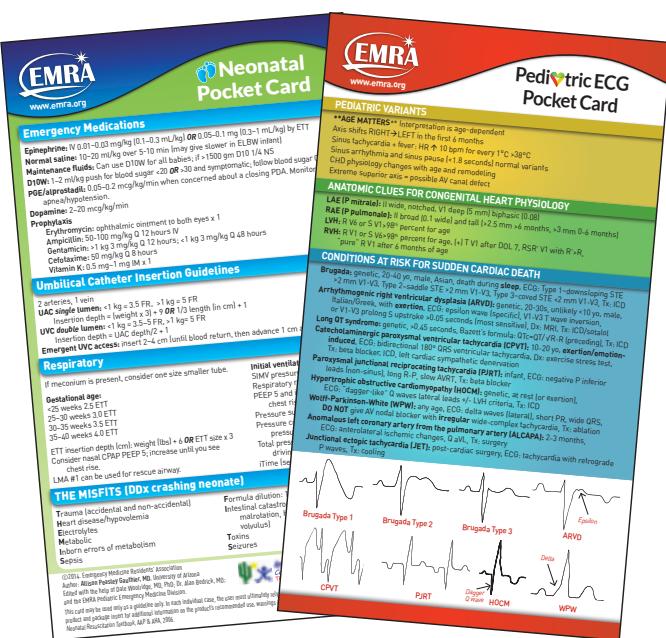
you have any comments or concerns, be sure to contact me as soon as possible, so that I can take your thoughts to the next meeting. **Let me know how I can best serve the EMRA members.**

My term as RRC rep is quickly coming to a close, and it is time to start thinking about the next person in line. The EMRA Board is seeking interested residents for the RRC representative position. The term will start with a transitional orientation RRC meeting in January 2015 with board responsibilities beginning at the 2015 SAEM meeting. Please contact me at rccemrep@emra.org if you are interested in the position or just want to pick my brain about the responsibilities it entails. It has been a great term so far, and I know that even bigger things are in store for the next RRC representative. *

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CRITICAL INFORMATION AT YOUR FINGERTIPS



**Approximately
90% of children
who died from
influenza in 2013
were not
vaccinated.**

Influenza and the FLU VACCINE

An estimated 10-20% of the world's population is infected annually with influenza. Up to 48% of children may be infected at any given time, with increasing numbers during pandemics.^{1,2} **Influenza has major global health and economic implications.** Pediatric illness can result in a loss of income for a family even if the symptoms are mild. In recent years, there have been concerns about pandemics with the surge of H1N1 cases in 2009, and most recently with the H7N9 avian influenza A outbreak in March 2013. While the latter has yet to show consistent documented human-to-human transmission, there is great concern that the disease will result in a major pandemic.³

Influenza is divided into two forms: influenza A and influenza B. There are two distinct strains of influenza B that

circulate in the U.S. annually, but only one is integrated into the most common trivalent influenza vaccine.⁴ Influenza B accounts for 25-44% of all influenza cases; however, in the 2012-2013 flu season, it accounted for up to 52% of pediatric deaths.^{4,5}

Clinical symptoms

The flu symptoms experienced by patients can vary. One study showed that **up to one-third of infected individuals are asymptomatic, allowing for transmission without knowledge of infection.**⁶ Patients may have mild cold-like symptoms, or severe illness that can progress to pneumonia and respiratory failure.^{6,7,8} Influenza symptoms in children are more variable than adults, with a higher percentage of patients reporting diarrhea, vomiting, or sore throat. Pediatric patients also shed the virus for a longer period of time.

Kathleen Stephanos, MD
Resident
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Complications

Annual pediatric deaths due to influenza in the U.S. during the last 5 years have ranged from 26 to 348,⁴ with the peak during the 2009-2010 season. In 2013, approximately 90% of the children who died from influenza were not vaccinated.⁹ Additional complications include secondary bacterial pneumonia, acute respiratory distress syndrome, myocarditis, rhabdomyolysis, and even neurologic sequelae, including encephalopathy and transverse myelitis.^{5,6,8,9} Neuropsychiatric compli-

PEDIATRIC EMERGENCY MEDICINE

cations are also more commonly noted in the pediatric population.¹⁰

Management

Management is largely symptomatic; however, **treatment with antivirals is recommended for all patients presenting within 48 hours of symptom onset.**^{5,13} For patients at high risk for complications, antivirals should be given regardless of when symptoms began. Current strains show high-resistance patterns to amantadine and rimantidine. As a result, oseltamivir should be used in any patient over 2 weeks of age, though zanamivir is an option for patients older than 7 years.^{5,11,13}

Prevention

Currently, vaccination is the recommended means of prevention. The WHO meets annually to select the A/H1N1, A/H3N2 and one B strain for the trivalent vaccine to be offered for the following flu season.^{5,14}

Vaccination is recommended for all persons over the age of 6 months.

This age cut-off is based on studies that show limited immune response in children less than 6 months of age.^{2,4} The American Academy of Pediatrics (AAP) recommends that pediatric clinics consider extending vaccination to parents.⁵ This may be advisable in emergency departments, where the vaccine is offered when children are seen. Parental vaccination status should also be considered part of the history, particularly in sick children.⁵ In addition to pediatric vaccination, it is recommended that all pregnant women be vaccinated regardless of trimester. There is evidence that vaccination can decrease premature delivery, and is believed to transfer some protection to neonates with an estimated decrease in influenza diagnosis by as much as 90%.^{2,5,14}

For those who have been exposed to influenza but have not begun to show symptoms, antiviral therapy is controversial. Some recommend universal use, but research suggests administration only to those at high risk of complications or living in households with immunosuppressed individuals.^{5,11}

Vaccination is available through a variety of routes, including intramuscular, intradermal, and intranasal routes. The live, attenuated intranasal vaccine is recommended for healthy children over

the age of two, but should be avoided in children with asthma, significant cardiac disease, immunosuppression/HIV, hemoglobinopathies, salicylic acid-treated diseases, chronic renal or metabolic diseases (including diabetes mellitus), diseases with respiratory compromise including neuromuscular disorders, and pregnancy.^{5,14} **Children with clinically significant moderate to severe febrile illnesses should not be vaccinated with any form of the vaccine.**⁵

There is no vaccine available for A/H7N9, so current recommendations are proper hand hygiene and standard respiratory precautions.^{3,5}

New trends in flu vaccination

In the last year, a quadrivalent vaccine has been tested on children between 6 months and 18 years of age, with evidence indicating that this is an effective means of influenza prevention. This novel vaccine includes the two most common strains of influenza B, in addition to influenza A

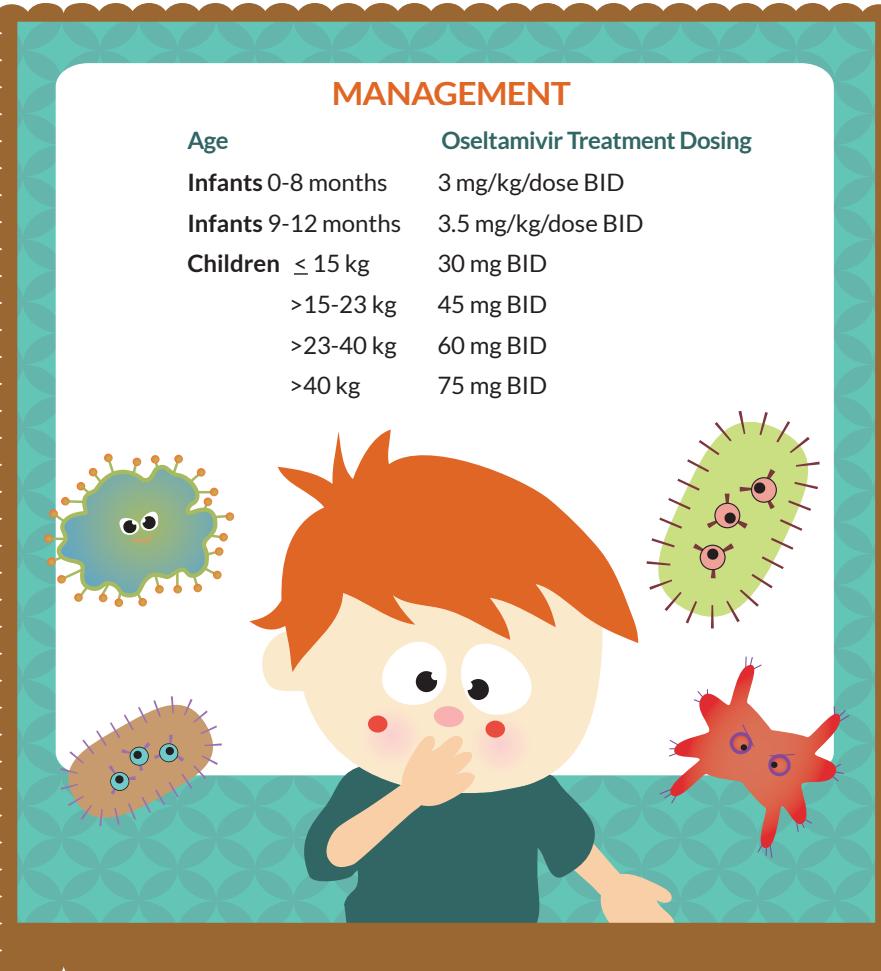
strains. The vaccine appears to be safe, and offered greater protection against influenza B than the standard vaccine.^{4,5}

Egg allergy recommendations have changed over the last several years. The CDC now recommends vaccination in those with mild to moderate (non-anaphylactic) allergy.^{5,12,14} The AAP recommends administration in a controlled setting with resuscitative equipment available, followed by a 30-minute observation period.^{5,14} This may make the ED an ideal place for these patients to come for vaccination.⁵ The AAP does not recommend assessment by an allergist before vaccination, unless severe egg allergy is known.^{5,12,14}

Finally, with mercury exposure being a concern to the public, thimerosal, a preservative in vaccines, has come under great scrutiny. The AAP and the CDC state that all vaccines should have minimal to no mercury, and while vaccinations with lower mercury levels are preferable for the pediatric population, this should not delay administration of the flu vaccine.⁵ *

MANAGEMENT

| Age | Oseltamivir Treatment Dosing |
|---------------------|------------------------------|
| Infants 0-8 months | 3 mg/kg/dose BID |
| Infants 9-12 months | 3.5 mg/kg/dose BID |
| Children ≤ 15 kg | 30 mg BID |
| >15-23 kg | 45 mg BID |
| >23-40 kg | 60 mg BID |
| >40 kg | 75 mg BID |



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Greetings from the Medical Student Council (MSGC)! It is my distinct honor to have been chosen to represent the EMRA medical student voice as chair of the MSGC in 2014-15. This is an incredible time for students to be involved with EMRA as we start this MSGC cycle with our largest membership on record — more than 2,200 medical student members! Our new council met for the first time in May, during the SAEM Conference in Dallas. There, we discussed what moves we can make to best serve EMRA student members. You have an outstanding group of representatives this year, and you are welcome to contact any one of us with your thoughts. I hope that you will reach out to your regional representatives and coordinators with any questions or ideas you may have. You can find your local representatives at emra.org.

I have been involved with EMRA for the past three years, but I know that for many students it is difficult to understand exactly what the organization offers you and what the MSGC does to represent you. At our meeting in Dallas, we discussed a number of important topics that affect every student pursuing a career in emergency medicine. This article gives a brief breakdown of how the 2014-2015 MSGC intends to help make your path toward matching into an emergency medicine residency program more successful.

A Hand Up

Communication

Our council will be ready, willing, and able to listen to all of your ideas and concerns about what is important to you when it comes to **getting involved in emergency medicine as a student**. We will be communicating with each other in order to spread the word about new opportunities available to student members. We want to connect with you on a more personal and individual level, and we hope that you will let us know what is on your mind!

Resources

EMRA has a wealth of valuable resources available to medical student members. At emra.org you'll find an extensive collection of documents, presentations, and links on EM education, advising, and research. For those of you who are leaders on campus, there are resources on how to improve your Emergency Medicine Interest Group (EMIG). These resources have been collected by past students and residents, and are maintained and updated as part of your membership — so use them!

Mentorship

This is one of our most valuable offerings, and one that is special to me and students in my situation. EMRA residents across the country have volunteered to act as mentors to student members as they go through medical school and prepare for the residency matching process. Many schools, including my own, don't have an EM program, so mentors can be difficult to find. As a medical student, I was matched with an EM resident who has been willing to meet with me and honestly answer questions that I have about residency training and the profession.

Opportunities

EMRA student membership gives you the chance to participate in so many different programs and experiences. We have internship and fellowship opportunities that are reserved for our student members, including the ALiEM Social Media Fellowship, and the Health Care Policy Elective opportunity, which is coming soon! We also offer a number of EMRA member-exclusive scholarships and grants, which can help you on your way to ACEP or other conferences. Some students forget that as an EMRA member, you are also an ACEP member, and there are so many opportunities for students through individual



state ACEP chapters. Ask any MSGC member about these benefits, or do some digging on your own. There's something out there for everyone!

Advocacy

Believe it or not, medical students make outstanding advocates, not only for emergency medicine, but for *all* physicians. We are the ones who will deal with the changes our health care system is currently going through — both the positive and the negative. Your membership makes it possible for EMRA to influence these changes in a way that keeps the **future of medicine and health care in the hands of physicians and patients**. Every single year, issues that affect students and residents are debated in Washington, DC and at state capitols across the country. Graduate medical education funding, student loan interest rates, and tort reform are all issues that we see again and again. EMRA allows you the opportunity to become involved locally and nationally through advocacy for the needs of our patients — and our specialty.

Peace of mind

You won't find a tab for this on our website, or an announcement on our Facebook page. But if you do a little searching and find ways to interact with your fellow student and resident EMRA members, **you will build relationships that could help to alleviate the intense stress** with which so many of us struggle. Each year of medical school offers new challenges, and having someone to talk to who is going through — or has been through — the same thing can be very reassuring.

EMRA's student membership has continued to grow over the years because people like you have continued to recognize and utilize the value of our organization and its offerings. Our leadership in years past has been outstanding; and as MSGC chair, it is my promise that our new council will continue that trend. We are excited about the year ahead, and we can't wait to hear from you at msgc@emra.org. *

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Working with Nurses and Alternate Practitioners

The following is an excerpt from EMRA's popular *Medical Student Survival Guide*, edited by Kristin Harkin, MD and Jeremy Cushman, MD. In this chapter about nurses and other practitioners, the authors explain the critical roles these care providers play and stress the importance of relationship-building within the ED. Please visit the EMRA website the download the FREE e-book, which covers such topics as the application and interview process, choosing a subspecialty, personal wellness in emergency medicine, charting, and much more.

It is common practice in the U.S. to use nonphysician practitioners to deliver patient care and to perform specialized and often highly technical procedures in the emergency department. Medical students on rotation in the emergency department will undoubtedly encounter nonphysician practitioners, working as part of the emergency medicine team, or as partners with consultants from other specialties within the institution. It is wise for the prospective medical student rotator to develop a comprehensive understanding of the similarities and differences in education, training, clinical capabilities, and responsibilities of the various nonphysician providers most likely to be encountered. Knowledge of the competency, roles and responsibilities of this group of patient care providers will assist the medical student rotator in assimilating as a member of the patient care team and serve to enhance his or her clinical experiences and interactions during the duration of the ED rotation.

Nonphysician practitioners

Nonphysician practitioners credentialed to practice in the United States include licensed practical nurses (LPN), registered nurses (RN), clinical nurse specialists (CNS), nurse practitioners (NP), certified nurse midwives (CNM), certified registered nurse anesthetists (CRNA), and physician assistants (PA). The most frequently encountered nonphysician practitioners in the emergency department are registered nurses, clinical nurse specialists, nurse practitioners, and physician assistants, as detailed.

Registered nurses are recognized as vital components of the emergency department workforce. They triage patients, perform direct patient care activities (e.g., patient assessments, periodic reassessments, medication administration, phlebotomy, specialized nursing care/interventions), ensure effective information transfer when the patient is admitted/discharged, and

foster open communication between patients, their families, and the emergency physician. Select nurses, generally with advanced education, also serve as department administrators, assisting with managing and overseeing staffing, patient throughput, and resolving patient complaints and staff concerns. Some nurses have specialized roles in academic institutions, serving as investigators in clinical, basic science, or translational research, as staff educators, or as sexual assault nurse examiners (SANE). Most RN training programs confer a bachelor of science in nursing (BSN), although many associate degree programs still exist. Nurses with expertise with regard to the practice of emergency nursing may be credentialed as certified emergency nurses (CEN) by meeting the prerequisites of the American Board of Nursing Specialties and the Emergency Nurses Association.

Clinical nurse specialists came into being in response to changes in health care technology that required nurses with highly



specialized knowledge and skills. Clinical nurse specialists provide patients with advanced clinical nursing care and are often engaged in educational activities instructing and educating hospital staff and patients on clinical issues. They provide direct patient care, educate staff and patients, consult with other professionals, and provide leadership and supervision. Clinical nurse specialists work in various environments according to their specialty, but most work in a hospital setting. To become a certified clinical nurse specialist, one must have completed a master's degree and on graduation be eligible to take the state certification exam for a CNS certificate as well as the professional certification exams for their specific study area.

Nurse practitioners and physician assistants are recognized as "physician extenders and mid level providers." Their roles and capabilities vary based on location, institution, and individual education, training, and experience. Physician assistants and nurse practitioners in the emergency department most commonly provide patient triage and direct patient care under the supervision of emergency physicians. The medical director of the emergency department or a designee has the responsibility of providing overall direction of activities of nurse practitioners and physician assistants in the ED through formalized agreements. Select physician assistants and nurse practitioners may serve as department representatives responsible for quality management, performance improvement, service excellence, and/or benchmarking. They may also serve as investigators in clinical, basic science, and translational research, and as faculty for continuing medical education coursework. The requirements with regard to the education, certification, and licensure of nonphysician providers vary, depending on the training program and its curricular design, affiliation with a degree-granting institution, and state regulations.

Advanced-level nonphysician practitioners

The distinguishing features differentiating nurse practitioners and physician assistants from other nonphysician practitioners (in addition to education and training) is the increased autonomy they are given with regard to patient care activities and their ability to bill patients (or insurance carriers) for their services.

Hospital and medical staff policies and procedures, bylaws, and other institutional, state, and federal rules and regulations very specifically define the nature and governance of nonphysician practitioner patient care activities and clinical privileges within a specific institution and region. Generally,

Nurses, physician assistants, and nurse practitioners can help medical student rotators assimilate more easily into the patient care team and enable them to more readily serve as functional team members with less difficulty.

nonphysician practitioners are capable of providing a wide range of services to patients in the United States. The services must be medically necessary and within the predefined scope of practice for the nonphysician practitioner.

In many circumstances, health care services provided by nonphysician practitioners are recognized and reimbursed by insurance carriers, including Medicare, Medicaid, and nongovernment insurance programs. The detailed guidelines for practice are different for each state; emergency physicians, therefore, need to be cognizant of the state and federal licensing regulations and registration requirements for nonphysician personnel with whom they work, so that an appropriate structure for documentation, coding and billing exists.

Practice models supporting advanced-level nonphysician practitioners

The American College of Emergency Physicians (ACEP) endorses guidelines for emergency department's that employ nurse practitioners and physician assistants to care for its patients. The best practice models incorporating nonphysician practitioners are based on the "team" concept; nonphysician practitioners are integrated with and work alongside emergency physicians to ensure the most efficient, effective provision of emergent health care. The implementation of a successful practice model including

nonphysician practitioners requires that the relationship between emergency physicians and nonphysician practitioners be formally defined; in particular, the scope of practice and the clinical privileges for each individual nonphysician practitioner must be clearly delineated and agreed on. Several different practice relationships and structures are possible. The structure of the relationship and the role of nonphysician practitioners in the emergency department are influenced by local and regional practice standards, state law, federal Medicare guidelines, needs of the patient population the emergency department serves, and the current competency, experience, and expertise of the individual nonphysician practitioner. Some nonphysician practitioner models of practice bestow more independence and clinical autonomy than do others. Most, however, expect the nonphysician practitioner to collaborate with the supervising emergency physician during the course of each patient encounter; specifically, the attending emergency physician is expected to evaluate the entirety of care provided and supervise the key portions of any procedures performed as each is occurring. This requirement for performing supervision is similar to that required of attending emergency physicians who work with medical students and residents. If a nonphysician practitioner is expected to perform direct patient care that is not contemporaneously supervised by a qualified emergency physician, then he or she should demonstrate specific experience and training in emergency care.

Nonphysician practitioners should also be educated with regard to institutional and emergency department policies and procedures, their scopes of practice, and their delineations of privileges. Emergency department medical directors are expected to provide oversight of all nonphysician practitioner patient care activities; this responsibility includes implementing assessments and measures focused on quality assurance and performance improvement. Practice models that ultimately require emergency physicians to accept final responsibility for patient outcome and satisfaction usually represent the best means for ensuring high-quality patient care in the emergency department.

Working with nurses and alternate practitioners

It is helpful for the medical student presenting to any patient care unit at the beginning of a clinical rotation to develop a productive, collegial relationship with the professionals working on that unit. Establishing excellent rapport with the professional staff working in the emergency department is essential for the successful assimilation of the medical student as part of the patient care team. This is much more challenging in the emergency department. Given the demanding and time-sensitive nature of emergent patient care and the wide variety of patient presentations one will encounter, medical students rotating in the emergency department who do not interact well with the professional staff may easily become overwhelmed, overworked, overlooked, or, worst of all, ignored losing an important opportunity to learn. Medical students whose professionalism, altruism, and interpersonal and communication skills enable them to integrate into the patient care team more quickly will undoubtedly be encouraged to participate fully within the entire spectrum of clinical opportunities available to emergency department rotators, and, as a result, will observe, experience, practice, and learn more emergency medicine.

Entering the ED as a medical student rotator is an exciting yet challenging learning experience. For many it will be the first time they encounter patients with high-risk, high-acuity medical problems since beginning their medical school training. The most important thing the medical student rotator must do when first presenting to the emergency department for a clinical shift is to introduce himself or herself to all staff members working on that shift. Medical student rotators should clearly state their names, their programs, and their year of training. Most academic institutions accept student rotators from prehospital provider training programs, nursing and other allied-health care professional training programs, and resident physician rotators from within and outside the department. Do not assume that the ED staff can distinguish the medical student rotators from these other student rotators.

It is important for medical student rotators to communicate professionally with everyone they meet (including the clerks, receptionists, transporters, and other ancillary staff working in the emergency department). Inappropriate, unprofessional medical student rotator interactions with emergency department staff usually have significant, long-standing consequences. More important, improved patient outcomes emerge when all members of the emergency department staff collaborate to provide care in accordance with a common set of core values that is patient-focused.

It is essential for medical students to familiarize themselves with the dynamics of relationships in the emergency department. Interactions with nurses are regular events during medical rotations as well as throughout one's career. Understanding the educational importance of those collaborative relationships and the true shared responsibility for patient care may be one of the greatest points a medical student can learn on rotation in the ED.

Teaching intuitions where medical students, residents, attending physicians, and nurses collaborate is a great place for students to learn from nurses as well as their physician mentors. Most students learn quickly that nurses can help students integrate into the unit and serve as a functional team member without difficulty. Multidisciplinary case management and excellent physician-nurse relationships are practices in health care that medical students will learn to master as they progress in their careers.

One area of anxiety and stress for medical student rotators new to the ED is dealing with the "seasoned" registered nurses working in the unit. The value of positive nurse-physician interactions is well recognized. Medical student rotators working and learning within the complex clinical environment of the ED will observe and appreciate just how much nursing care is required for the prompt, timely, accurate, and safe execution of emergent health care decisions and interventions. A critical issue is to learn the importance of excellent interpersonal and communication skills (especially with nurses), and how those skills contribute to fostering the cohesion necessary for

the smooth functioning of the patient care team. Medical student rotators should learn how to write orders on their patients (legibly and correctly), and how to inform nurses that they require execution. Medical student rotators should understand that many nurses have excellent clinical skills and an uncanny ability to promptly distinguish between patients who are acutely sick and those who are not; their recommendations and suggestions should not be discarded without due consideration. A truly shared responsibility for patient care between medical student rotators and nurses should exist.

Summary

A positive working relationship and continued growth in mutual educational efforts will only strengthen a currently sound professional partnership between emergency physicians and nonphysician practitioners.

Emergency departments with teaching programs where medical students, resident and attending level physicians, and nursing staff are continuously working together as part of an integrated team are unique environments for medical students. The breadth of practitioners

providing patient care, the depth of each practitioner's experience, and the wide spectrum of patient presentations make the ED a great place for a rotating medical student to receive a broad clinical education that transcends the experiences available on other inpatient units. Medical student rotators can learn from nurses and other advanced-level nonphysician practitioners as well as from their resident and attending-level physician mentors. Nurses, physician assistants, and nurse practitioners can help medical student rotators assimilate more easily into the patient care team and enable them to more readily serve as functional team members with less difficulty.

More than ever, practicing emergency medicine in the twenty-first century requires emergency physicians to work well alongside a cohesive team of personnel dedicated to providing only the highest quality patient-oriented emergency care. The challenge of current and future health care providers is to continue to recognize and appreciate the importance of creating an environment where all members of the health care team can contribute toward excellent patient care; when this is achieved, positive patient outcomes are the result. *



The ProCESS TRIAL



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A Landmark Study in Sepsis Management

Despite major advances in its detection and management, sepsis continues to be one of the nation's leading causes of death.¹ Earlier this year, the **Protocolized Care for Early Septic Shock (ProCESS)** trial made waves in the world of sepsis management. This study reached some groundbreaking conclusions, and all emergency medicine physicians should be made aware of their findings.

Since the landmark Rivers study in 2001, early goal-directed therapy (EGDT) has been the standard of care for the management of septic shock.^{2,3} After the identification of severe sepsis or septic shock, this management protocol requires central venous and arterial catheter placement in order to monitor certain hemodynamic parameters. Resuscitation efforts would focus on maintaining these parameters within specific ranges. These measures were undertaken regardless of the degree to which the patient was hemodynamically compromised. **Despite its efficacy, subsequent studies have shown similar benefits with less invasive strategies for monitoring the patient's clinical status**, including serum lactate clearance, inferior vena caval collapsibility, and vital signs.^{4,5} Findings such as these have led many to wonder if the invasive aspects of the EGDT protocol are uniformly necessary; this is the question that the ProCESS trial attempted to answer.⁶

In this prospective, multicenter, randomized study, 1,341 septic patients were placed into three treatment groups. One group received EGDT; another received a resuscitation protocol that did not mandate the placement of a central line; and the final group did not receive any protocol, leaving all management decisions up to the treating physician. The patient was then closely followed for 72 hours. The primary outcome measured was in-hospital death at 60 days, along with several secondary outcomes that assessed morbidity. The results showed no significant difference in 60-day in-hospital mortality between the three groups. Virtually none of their secondary outcomes, which included death by 90 days, mechanical ventilation, length of hospital stay, and serious adverse events, were found to be significantly different. **The authors concluded that protocol-based management of sepsis did not reduce morbidity or mortality when compared to management left up to the physician's discretion.** Furthermore, the mandated use of central venous catheters for hemodynamic monitoring – cornerstones of EGDT – did not show any benefit as compared to physician-directed judicious use of invasive monitoring.

An interview with two experts

Drs. David Huang and Haney Mallemat answer some questions regarding the study and its implications. Dr. Huang is a co-author of the ProCESS study, an EM-trained intensivist, and the director of the University of Pittsburgh Multidisciplinary Acute Care Research Organization. Also an intensivist, Dr. Mallemat is a physician at the University of Maryland Medical Center. Through social media platforms, he has gained an international following as a master educator in the field of EM-critical care, teaching physicians across the globe via Twitter (@CriticalCareNow).

Did any of the results surprise you?

DH: My main desire was simply to have informative results. Interestingly, before we unblinded the data, we did an informal survey of all the site investigators and found a wide variation in opinion as to the results. Some were sure there would be a benefit, and others were sure there would be none.

HM: No, I was not surprised. EGDT has been questioned for several years now, and there have been other studies conducted [since its publication] that have questioned the need for such a protocol.

What do you think is the take-home message from this study?

HM: We must identify septic patients early and be aggressive in their care. The reduction in mortality from sepsis [over the years] is likely a reflection of early and aggressive care in the emergency department — care that was pioneered by the EGDT trial. So the take-home message for me is early identification of sepsis, followed by early resuscitation and antibiotic administration.

What will you teach your residents and fellows?

DH: I will tell them that the core principles espoused in the 2001 Rivers, et al. study still hold true. Early diagnosis, antibiotics, fluids, cultures, and hemodynamic assessment and restoration are essential to sepsis management in the emergency department.

HM: Its results support the notion that one should not strictly adhere to EGDT, as was previously the practice. I think that is the major teaching point for residents and fellows.

What implications will this study have on the future of EGDT?

DH: Everyone agrees that therapy should be given early for sepsis and directed towards physiologic goals. All debate, however, what these specific goals should be — inferior vena cava diameter, central venous pressure, lactate clearance, etc. So I think that this study has helped to further cement the importance of early therapy directed towards goals, while also adding to the debate on what the specific goals should be. I think EGDT may still be useful in some specific patients — e.g., a patient with a known cardiomyopathy. This is just my personal opinion, however, and was not addressed by the ProCESS study.

What would you like to see in future studies regarding sepsis management?

DH: I would like to see future trials become “smarter” and “faster.” For example, smarter design could include narrower phenotyping at the clinical level. Septic shock from ascending cholangitis is different than that from pneumonia; as such, pathophysiology — and thus potential benefit — from a proposed novel intervention may also be different. Faster design would include seamless collaboration between clinicians and clinical trialists; decreased regulatory barriers; and pragmatic, large, simple, trials.

HM: I’d like to see studies that identify better markers of sepsis and hypoperfusion, and studies that assess how much fluid should be given during the early phases of resuscitation. I would also like to see advances in the realm of non-invasive hemodynamic monitoring.

Summary

Protocol-based care may not always be necessary in order to appropriately manage severe sepsis or septic shock. The time, effort, and risks involved in the placement and maintenance of central venous and arterial catheters should be reserved for patients who would truly benefit from their utility. In addition, central hemodynamic monitoring strategies don’t necessarily seem to be superior to other less invasive means of assessment in certain patients. Finally, the ProCESS study shows just how important identification, aggressive *and* practical resuscitation, and early antibiotics are to the treatment of sepsis. Despite how impactful this study has been, it will be interesting to see what results similar trials produce in the future. Two in particular — The Australasian Resuscitation in Sepsis Evaluation and the Protocolised Management in Sepsis trials — are ongoing studies that will certainly add valuable conclusions of their own to the exciting field of sepsis management. *

*Emergency
department hallway,
Kilimanjaro Christian
Medical Centre,
Tanzania*

Getting your foot...

Many fellowships and residencies draw a distinction between the terms international and global health.

Mention international emergency medicine and you're bound to get questions about natural disasters, wars, and physicians dropping into villages with no running water, much less a CT scanner. The reality of working in international and developing world settings is usually less exciting, but is ripe with opportunities for quality improvement, academics, and research. If you're planning on a future focused on patients with the greatest need, read on! We've included advice from several experts on international emergency medicine to help you chart opportunities in projects and research — both abroad and domestic.

Discover your passion

Before signing up for a project, it's important to fit yourself into the alphabet soup of international EM work. Many

residents and medical students have participated in short-term international work but are still looking for a more long-term commitment. First, start by identifying your possible niche within the recognized focus areas of the field: systems development, humanitarian relief and disaster management, public health/prevention, field (pre-hospital) medicine, program administration, or academics.^{1,2,3} It is worth mentioning that **many fellowships and residencies draw a distinction between the terms international and global health.**

International EM refers to a focus on the development of EM residency training and humanitarian response, while *global health* refers more broadly to the transnational promotion of public health and clinical care.⁴

While many emergency physicians opt for short-term relief work, Catherine Lynch, MD, director of EM Global Health at Duke University, advises keeping an eye on research, which can help you contextualize your work, ensure your impact persists longer than your physical commitment, and fight clinical burnout. Quality research takes place across all facets of global health.

Find a mentor

A strong mentor will help you explore the diversity of global health service and research. There may be only one person working in your area of interest at your medical center. There may be none at all. Developing a general toolbox of skills early in your IEM career is more important than the specifics of your location or project, so don't fret.

Global Health and Emergency Medicine

out the door

Advice from experts on international emergency medicine to help you chart opportunities in projects and research — both abroad and domestic

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INTERNATIONAL EM

Identifying a partner organization and site involves finding a place that is open to improvement, while recognizing that there will be limited infrastructure and research support.

Table 1. Online links for international resources

| | |
|--|--|
| EMRA International Division | www.emra.org/committees-divisions/international-division |
| ACEP International Section | www.acep.org/InternationalSection |
| International EM Fellowships Consortium | www.iemfellowships.com |
| SAEM Fellowships Database | www.saem.org/membership/services/fellowship-directory |
| Global Health Fellowships Database | www.globalhealthfellowships.org |

Makini Chisolm-Straker, MD, international EM fellow at New York Presbyterian Hospital, advises, “Join a project that you respect, and where you can be of service and be supervised and guided...otherwise it’s not worth the stress.” When in doubt, don’t be afraid to knock on more doors. Faculty from neighboring medical centers may be more receptive to outside projects than you think. Also, check out emra.org, which offers a service to connect EM residents and medical students with IEM fellows who can help you think through research and project options.

Find a partner location

Identifying a partner organization and site involves finding a place that is open to improvement, while recognizing that there will be limited infrastructure and research support.⁵ Joseph Novik, MD, who previously helped establish the first Rwandan emergency medicine training program and taught ultrasound in Rwanda through his work with Human Resources for Health (HRH), observes that **connecting with a partner institution in an organic way relies upon trust-building**: “When you first show up, try to observe without doing or saying much for a few weeks, even if you think actions could be done better. This will help you gain insight to practice patterns and build partnerships based on trust and mutual respect.”

Even when travel is not an option, you can still make an impact. The *Global Emergency Medicine Literature Review* identifies and publishes an annual review of top articles in emergency medicine and global health; its managing editor, Tom Becker, MD, is the past chair of the EMRA International Division. He encourages residents to apply to be article reviewers for the project (applications are due in September 2014). This is an excellent way to **explore and become involved in global health and international medicine** without having to leave the confines of your own home.

Plan your future

When considering a career path in global health or international emergency medicine, there are many potential routes. Fellowships, nonprofit work, and governmental work are all on the table. Dr. Novik advises,

*“You don’t have to do a fellowship in global health work. If you’re looking to develop an academic niche for yourself, then you **should** do a fellowship, but it doesn’t necessarily have to be a global health fellowship.”* The need for experts in emergency ultrasound, disaster medicine, and EMS is not limited to the high-income world – practically any fellowship can be applied to global health, so pick the one you love.

Ideally, the community you serve will help you identify your ideal partner organization. As Dr. Chisolm-Straker observes, “*The provision of, and participation in, health care is true service. We are doing noble work. Done well, it is very, very hard. It is important. It is humbling.*” *

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Across the Pond

A Comparison of
Emergency Medicine
in the US and the UK

**By sharing EM knowledge internationally,
we can integrate new and effective methods
of delivering emergency care domestically.**



Kristen Mueller, MD
Washington University
in Saint Louis
Saint Louis, MO

Background

Thanks to an EMRA-sponsored Global Health Initiative scholarship, I recently had the opportunity to travel to the U.K. and rotate through Queen Elizabeth Hospital Birmingham's Accident and Emergency Department. Coming from Washington University in St. Louis, I was uncertain what to expect. I didn't know if the population would be the same, or if practice patterns would be similar — **what was it going to be like working in such a different health care system?** Would emergency medicine be the same? What lessons would I learn?

There are certainly a number of similarities in emergency care between our two countries, but a number of striking differences are also readily apparent. I worked in Queen Elizabeth Hospital (QE), a large, academic tertiary care facility. It is also a major trauma referral center, and has an annual ED census approaching 100,000 patient visits per year. It is demographically comparable to many of the training institutions that residents staff in the United States, and in a similar city practice environment. In our constantly changing health care climate, I found juxtaposing our two systems enlightening.

A useful comparison

According to the World Bank, from 2009–2013 the United States spent 17.9% of its gross domestic product (GDP) on health care.¹ In comparison, the United Kingdom spent only 9.3% of its GDP on health care during the same period.¹ Yet despite our increased spending, the U.S. consistently ranks below the U.K. and other First World countries in health care system performance measures, including quality, access, efficacy, and equity of care.^{2,3} In the most recent international health care rankings by the commonwealth fund, the U.K. ranked second overall behind the Netherlands.² In this era of health care reform, it is worth investigating the different ways in which EM is effectively practiced in other countries with similar financial and technological resources.

The National Health Service: A brief history

The U.K. established the National Health Service (NHS) in 1948. The NHS is a universal health care system, and its central principle is that health care should be freely available to all its citizens. While the NHS has been widely supported by the public, in the 1990s it was hampered by insufficient numbers of physicians and nurses, inadequate hospital equipment, and a lack of national standards. EDs were particularly affected, plagued by long wait times and a lack of

integration within the greater health care system.⁴ In 2000, in response to these issues, then Prime Minister Tony Blair enacted a major overhaul of the NHS.

The four-hour target

The introduction of the “four-hour target” was perhaps one of the most dramatic outcomes of the 2000 NHS plan. Under this guideline, hospitals were given major financial incentives to update and streamline emergency care with the final goal of all emergency care not exceeding four hours in total.⁴ This four-hour clock starts from the moment the patient checks into the ED, and ends when the patient is physically out of the ED. With the implementation of this rule, by 2006 over 95% of patients in a crosssection of 20 EDs across England were seen and treated within 4 hours.⁵

In 2013, QE and my home institution were evenly matched with 96,167 patient visits and a 28% admit rate, and 95,600 patient visits and a 27% admit rate, respectively. QE, however, was able to meet its patient load with one-third of the ED bed space – an achievement made possible, in large part, by the non-existence of ED boarding.

That said, controversy remains regarding whether meeting this four-hour target actually improves patient outcomes.⁶ It must also be noted that there are significant differences

in medical landscapes between the U.S. and the U.K., and the potential impact of legal action against ED physicians in the U.S. cannot be ignored. In a similar vein, many aspects of the four-hour rule are contrary to basic standards of ED care in the U.S. For example, in the U.K., the admitting providers—not the ED team—follow up all non point-of-care ED labs, including troponins in non-STEMI chest pain; and patients never stay for a second troponin in the ED (although they may be admitted for additional testing).

With the current climate of bed shortages, nursing shortages, and ED and hospital overcrowding, a four-hour target is unlikely to be successful in most academic institutions in the U.S. However, as ED wait times grow and physician performance is increasingly evaluated based on patient satisfaction, concrete time endpoints to ED visits may be needed. Any target time should have buy-in from the hospital administration and should allow sufficient time to accomplish initial resuscitation, diagnostic and laboratory testing, and preliminary interventions, while also decreasing ED overcrowding and improving patient satisfaction.

EM training

Emergency medicine training has been available in the U.K. since 1972, and has been a board-recognized specialty since



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Annals of Emergency Medicine

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Despite our increased spending, the U.S. consistently ranks below the U.K. and other First World countries in health care system performance measures.

1983.⁷ Compared to the now streamlined EM training scheme in the States, training in the U.K. is more protracted (*Table 1*). Training sites at the “foundation” and “basic” training levels are randomly selected and do not always include EM rotations, which makes it challenging for future U.K. physicians to gain exposure to the specialty. Additionally, not all EM registrar (residency) programs include training at a regional trauma center (level I trauma center), which can lead to deficiencies in the knowledge of ED trauma management.

ED staffing and supervision

At this time, all attending-level physicians in the NHS across all specialties are paid approximately £48,000 per year and work approximately 48 hours per week. This has made it difficult to recruit new physicians into EM, as many choose to become general practitioners with the associated regular weekday schedule without night or weekend responsibilities. At QE, there are only 11 EM board-certified attendings and eight EM registrars to cover the hospital’s volume of nearly 100,000 patient visits per year. In comparison, my home institution in St. Louis has 47 EM attendings and 48 EM residents to cover the same patient load. As a result, **many U.K. EDs are staffed primarily by physicians in their foundation and basic training years**, even at major academic level I trauma centers like QE. Many EDs are never staffed with an attending, and the attendings provide only home call coverage at night. In the U.S., on the other hand, my EM attendings still staff every patient who comes through the ED.

MERIT: Medical Emergency Response Intervention Team

Another difference between the NHS and U.S. systems is the MERIT pre-hospital crew. Within the West Midlands Regional Trauma Network, which services most of the middle and western parts of England and Wales, there is a 24/7 MERIT team composed of one EM or critical care-trained

(before a primary or secondary survey is performed!). Although the MERIT team is relatively new, and full outcome data on its efficacy is still pending, at this time the hospital ED and trauma teams are very pleased with this new system.

Conclusions

EM is a relatively young specialty worldwide. Systems that work well in

Table 1. Comparison of EM Training in U.S. vs. U.K.

| EM training in US | EM training in UK |
|------------------------------------|--|
| Complete high school | Complete secondary school |
| 4 years of university training | 5-6 years of medical school |
| 4 years of medical school | 2 years of foundation training* 3 years of basic training** |
| 3-4 years of EM residency training | 5 years of EM registrar training |
| Total: 11-12 years | Total: 15-16 years |

*similar to year 3-4 of medical school in the US

**similar to general medical or surgical internship in US

physician, and one trauma-critical care paramedic. They respond via helicopter by day and via well-outfitted minivan by night to all level 1 traumas in the area to provide additional medical support to the on-scene paramedic team. The MERIT team was created in response to historically poor trauma outcomes in this area of the country. With assistance from the highly trained MERIT team, pre-hospital teams are more likely to effectively perform potentially life-saving pre-hospital procedures like intubation and thoracotomy. MERIT’s medical expertise is so well trusted that, on arrival to a trauma center ED, stabilized level 1 trauma patients will frequently go directly to CT

one country can be challenging in others with different approaches to health care. However, emergency care in the U.S. would benefit from lessons learned in the U.K. regarding improved patient flow through the ED and incorporation of pre-hospital systems like the MERIT team. Conversely, if EM training in the U.K. were to become more streamlined — similar to training in the States — it might be easier to recruit physicians into emergency medicine. By sharing EM knowledge and experiences among physicians *internationally*, we have the opportunity to integrate new and effective methods of delivering emergency care *domestically*. *



Zach Jarou, MD
Vice Chair
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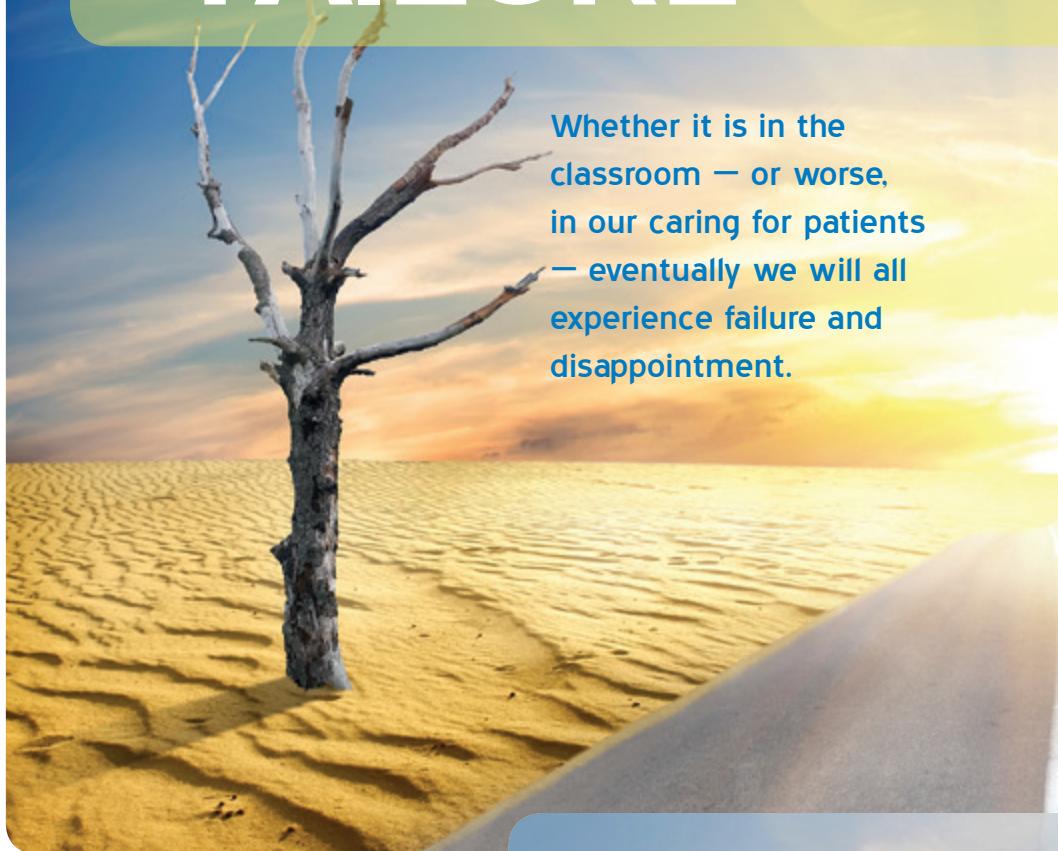
FAILURE. It's something with which we often don't have a great deal of experience, or something that we often ignore. Most of us have worked hard our entire lives to succeed and overcome, and for those of us just entering the medical profession, failure often yet hasn't been a part of our lives. After all, we wouldn't have made it this far if we didn't excel at jumping through hoops, making the grades, and continually striving to be the best we can be. **However, life doesn't always go our way — eventually we will fail.** We are not infallible. Whether it is in the classroom — or worse, in our caring for patients — eventually we will all experience failure and disappointment. As physicians, we are trained in how to deliver bad news to our patients, but **how do we deal with being on the other side of the conversation?** We've learned Kubler-Ross' stages of grief — denial, anger, bargaining, depression, and acceptance — but have we ever struggled through them?

Speaking from experience

I will never forget receiving the news. It was halfway through my third (and most difficult) year of medical school. I had just returned from a much-needed winter break and was settling into the first week of pediatrics. Inside of the small exam room, my little patient and I were startled by the piercing beep of my pager. *Probably another misdialed number*, I thought, having only received a handful of pages in the months since the device was assigned to me. Requiring students to carry pagers in an era of text messaging and smart phones always seemed more like a hazing ritual than a useful means of communication. Unfortunately, the page *was* intended for me; when I called it back, I was surprised to hear the voice of the OB/GYN clerkship director on the other end of the line.

I was informed that due to "professionalism issues" cited by one of the residents

Confronting FAILURE



Whether it is in the classroom — or worse, in our caring for patients — eventually we will all experience failure and disappointment.

The Road

Two roads diverged in a yellow wood,
And sorry I could not travel both
And be one traveler, long I stood
And looked down one as far as I could
To where it bent in the undergrowth;
Then took the other, as just as fair,
And having perhaps the better claim,
Because it was grassy and wanted wear;
Though as for that the passing there
Had worn them really about the same.
And both that morning equally lay

I had worked with for only a few days during the first week of the rotation, I would be required to do a month of remediation before I could receive a grade of conditional pass.

DENIAL. My stomach dropped. What had I done to deserve such a poor evaluation from someone whom I barely knew? Surely there must be some sort of mistake!

ANGER. It was no secret amongst my classmates that this was a malignant rotation. The residents were a miserable bunch and seemed to derive some sort of twisted joy from treating us like dirt. Professionalism?! How dare someone throw me under the bus and threaten my future success without ever speaking to me in person about their concerns? Now *that's* unprofessional. For the next several weeks, I couldn't think about the whole ordeal without my blood boiling.

What I thought I learned

The power disparity was striking. Multiple rounds of appeals yielded no results. In the eyes of my departmentally-affiliated arbitrators, the unsubstantiated claims of the resident would always trump the word of the student. I had been systematically denied the opportunity to speak face-to-

Building RESILIENCE



Not Taken

In leaves no step had trodden black.
Oh, I kept the first for another day!
Yet knowing how way leads on to way,
I doubted if I should ever come back.
I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I —
I took the one less traveled by.
And that has made all the difference.

— Robert Frost (1920)

face with my accuser in the presence of a mutual supervisor. I was confused and without an advocate.

BARGAINING. What could I have done differently? If only I had told everyone that I wanted to specialize in the field they had chosen for themselves. If only

I had asked for more feedback. If only I had constantly reported the most mundane of my activities to the senior residents so that there was no question as to my whereabouts at all times. If only I had been more of a gunner and tried to steal patients and procedures away from the other students to show how truly interested I was. If only I hadn't accidentally nodded off for those 5 minutes during that one lecture. If only I had brought in more snacks for the residents, then they would have given me good reviews.

DEPRESSION. I felt helpless and alone. How on earth would I land my dream residency with this huge red flag on my application? Would years of achievement be overshadowed by a single evaluation? There didn't appear to be any light at the end of the tunnel.

ACCEPTANCE. The uncertainty and mental anguish associated with fighting a losing battle had taken its toll on me. For my own sanity, I had no choice but to accept my fate. I was done dwelling in the past. As my anger subsided and my perspective enlarged, I came to embrace that, in the grand scheme of things, it wouldn't kill me to do another month of OB/GYN. I felt it was unfair, but it was my best solution to move forward, which, by that point, in time was all I really wanted.

What I really learned (the road not taken)

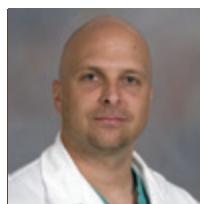
If it weren't for the Netflix hit *Orange is The New Black*, I may have lived my entire life never understanding the true message of American poet Robert Frost's "The Road Not Taken." A quick line of dialogue between the show's characters prompted me to revisit Frost's words for the first time in years. I had always believed that "taking the road less traveled" was a manifesto for breaking away from the crowd and blazing your own trail. I was amazed at how wrong I had been. There it was — in black and white — both paths appeared exactly the same. **There was no road less traveled.** The traveler made a choice between two equals. It is only "somewhere ages and ages hence" that he claims he took the road less traveled, which "made all the difference." This isn't a story about individualism or adventure, **it's a story of wanting to believe that the choices we've made and the experiences we've had were meaningful.**

So what does this century-old poem have to do with my experience? What good could possibly come from experiencing failure early in my career? I've learned to take a step back to gain perspective when things seem overwhelming. I've learned to hold my head high in the face of adversity. I've made my challenges public so that other students can know that they are not alone in their own similar situations. I have been a confidant and a shoulder to cry on. I know in my heart that this experience has better equipped me for the inevitable challenges that the future surely holds. **I have taken the road less traveled — I've become resilient — and it has made all of the difference. ***

Probing
for
answers



ULTRASOUND EVALUATION **Achilles Tendon**



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Failure to promptly diagnose an Achilles tendon rupture can result in retraction of the disrupted ends of the tendon, which may affect operative repair and result in prolonged disability.

Case

A 39-year-old male presents to the emergency department with pain and swelling in his right ankle two days after an injury he obtained while playing volleyball. He reports hearing a "pop" when landing after a jump, and has had swelling, difficulty walking and bearing weight, and difficulty with plantar flexion. His exam is remarkable for significant swelling, ecchymosis, and tenderness at the posterior aspect of the right ankle. He has weakness of right plantar flexion, but an equivocal Thompson test. He has no bony tenderness and is neurovascularly intact. Right ankle X-ray shows only evidence of swelling compatible with soft-tissue injury. Out of concern for a possible Achilles tendon rupture, a bedside ultrasound of the ankle is performed (Figure 1).

Discussion

Achilles tendon rupture most often occurs after sudden dorsiflexion of a plantar-flexed foot, or by pushing off the foot with an extended knee. It is most commonly seen in the fourth or fifth decade of life, and may be related to repetitive overuse or deconditioned states.¹ Traditionally, diagnosis has been made by history and physical examination. History often includes trauma with a “popping” sensation and sudden pain. Physical exam findings include the “hatchet strike” sign (a palpable proximal defect in the Achilles tendon) or a positive Thompson test.² The area of rupture is likely to be found in the hypovascular area 3-6 cm proximal to calcaneal insertion.¹

To perform the Thompson test, the examiner has the patient lie prone and squeezes the calf while observing the foot for slight plantar flexion. Pain and swelling can make diagnosis difficult.

An estimated 20-25% are missed on initial exam, and are often misdiagnosed as ankle sprain.³

Failure to promptly diagnose an Achilles tendon rupture can result in retraction of the disrupted ends of the tendon, which may affect operative repair and result in prolonged disability.⁶ MRI is often used as a confirmatory test, but it is expensive, delays time to diagnosis, and there is no literature supporting its use.⁴

Point-of-care ultrasound (US) is becoming increasingly commonplace in the ED.

With its low cost, expedience, and accessibility, US is finding expanding utility in musculoskeletal imaging. US offers a dynamic, physician-directed assessment of injuries that may otherwise only be seen with costly and time-consuming MRI exams. In the evaluation of suspected Achilles tendon rupture, US is a readily available and reliable means of diagnosis, and especially invaluable in patients with equivocal clinical exam findings.^{1,5}

Some advocate US in the evaluation of suspected tendon injuries as the standard of care in the emergency department.⁶ Several clinical studies clearly demonstrate the effectiveness of US in the diagnosis of both partial and

complete Achilles tendon injuries. US has a reported sensitivity of 96-100% and a specificity of 83-100%.¹

To perform the exam, the patient should be lying prone with the feet hanging off the bed. A high-frequency linear array probe is placed over the posterior ankle in long-axis, i.e., indicator pointed towards the patient's head. In long axis, the normal tendon has a fibrillar pattern with uniform thickness and echogenicity (Figure 2). In short-axis, the normal tendon has an oval shape with speckled echotexture.^{7,8} The main US findings of Achilles tendon rupture are a loss of integrity of the path of the tendon, hematoma formation in the gap between torn tendon ends, posterior acoustic enhancement at the edges of the tear, and alterations in the echogenicity and shape of Kager's triangle (the pre-Achilles fat pad).^{1,7,9} Dynamic US can differentiate complete from partial

ruptures. To perform this exam, have the patient gently plantar flex the ankle against resistance. A full-thickness rupture is indicated by movement of the tendon ends away from each other.¹

Case conclusion

*Bedside ultrasound clearly demonstrated a complete rupture of the Achilles tendon (Figure 1). The orthopedic service was consulted and a short leg posterior splint was placed. The patient was discharged with pain control, crutches, and instructions for non-weight bearing status. He was subsequently seen in the orthopedic clinic and scheduled for operative repair. In this case, bedside ultrasound enabled rapid evaluation and definitive diagnosis, thus expediting treatment and disposition in the face of somewhat equivocal physical exam findings. **

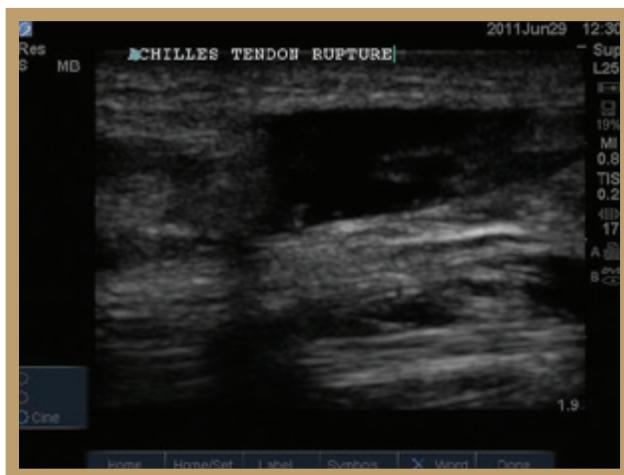
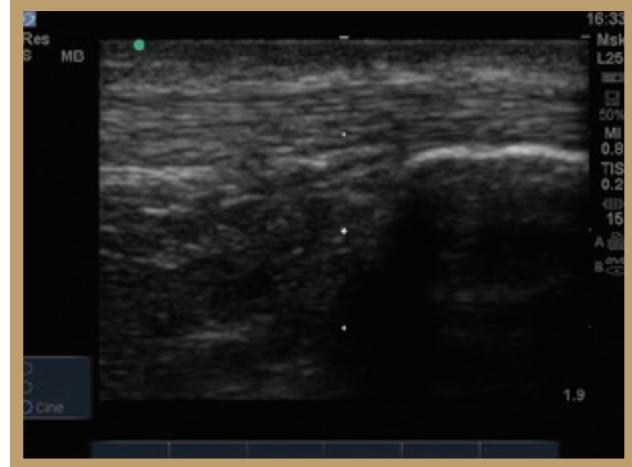
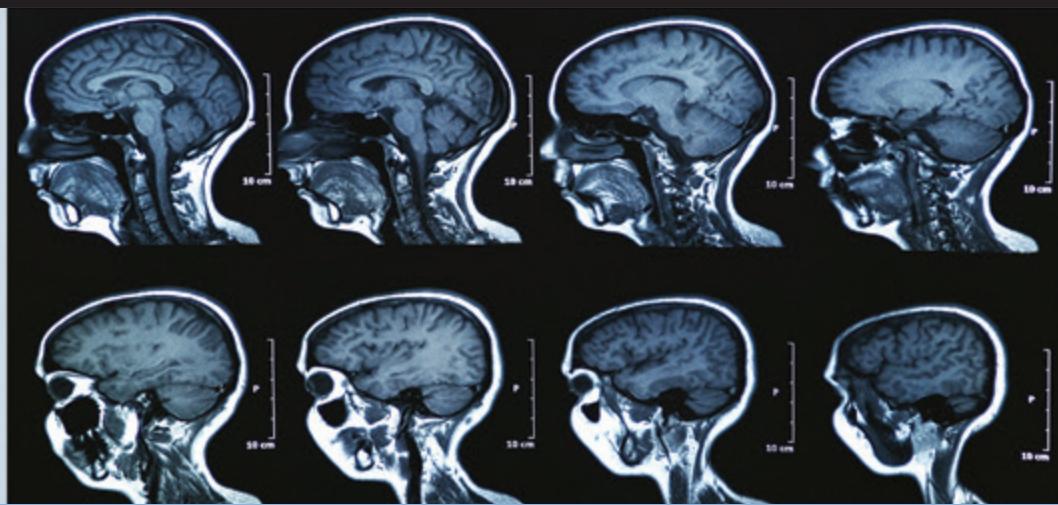
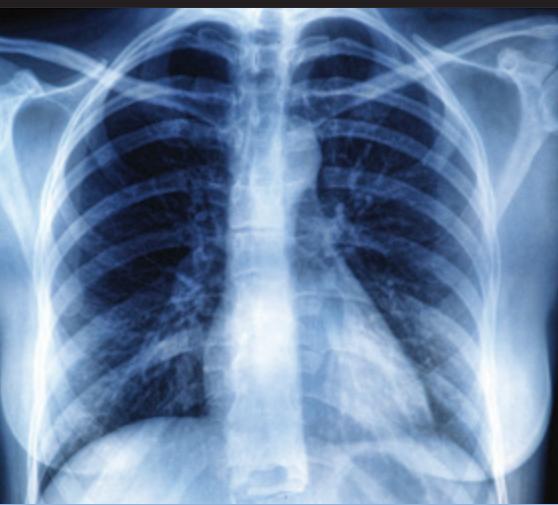


Figure 1.
Ruptured Achilles tendon (longitudinal view).

Figure 2.
Normal Achilles tendon in longitudinal view, just proximal to insertion point.





The not-so- incidental radiographic finding

As the use of imaging modalities continues to increase in frequency, the incidence of unexpected radiographic findings continues to rise. Often referred to as “incidentalomas,” they represent a unique dilemma for patients, physicians, and the health care system. These now common discoveries amount to millions of dollars, and can have a large impact on patients’ lives and physicians’ careers.

Consider the following case: A 62-year-old male involved in a minor motor vehicle accident presents to the ED with shoulder pain. He is otherwise well, and receives just plain films of the chest and shoulder. Both are read as negative by the emergency physician, so he is discharged home. The next day, a radiologist reviews the films and comments on the presence of a solitary pulmonary nodule in the left lung; he recommends followup. This recommendation goes unread until years later – by an attorney.

Two years after the first visit, the patient presented with dyspnea, was found to have metastatic lung cancer, and

subsequently expired. The ensuing lawsuit names the emergency physician, radiologist, and primary care doctor.

Most of us are frustrated by incidental radiographic findings. We become emergency physicians to deal with emergencies. When the stat trauma rolls in, it’s the acute life-threatening pneumothorax that concerns us, and not usually the 5 mm blip next to it that “warrants further non-emergent imaging.” It can already be a challenge to juggle the many urgent tasks that need to be done; expending precious cognitive effort on something that is, in the majority of cases, *nothing* can be burdensome.

The academic study of incidental radiographic findings is still early in its course. However, two facts seem to hold true regardless of the organ system in which they are found or the discipline studying them: **the majority are benign; and, as the use of imaging continues to climb, they are being encountered at an increasing rate.** We are more frequently being presented with non-emergent distractors that, more

often than not, represent *risk* instead of benefit to the patient.

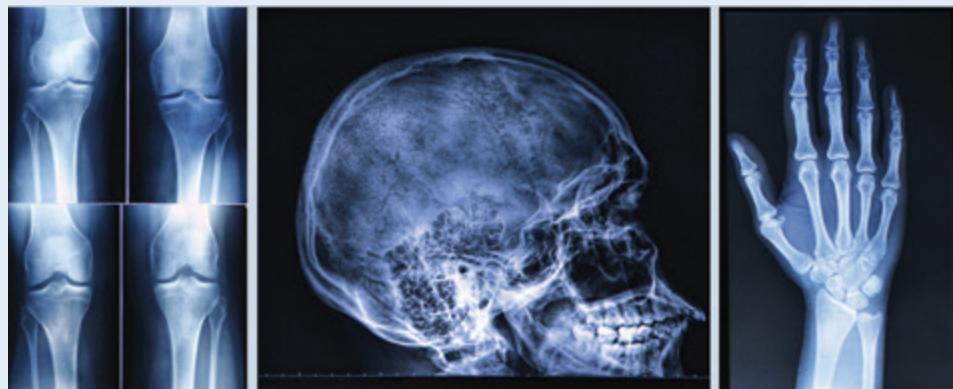
Just how common these incidental findings are is not yet entirely known. We have a rough estimate, largely due to trauma patients and the increasingly popular “pan-scan” – the one-stop CT of the head, chest, abdomen, and pelvis. One 2013 study reported that 44.5% (143 of 361) of trauma patients receiving a “pan scan” had at least one incidental finding.¹ Other studies of equally-imaged trauma patients show similar incidences of at least one incidental finding per patient in 34% and 45%.^{2,3} A 2011 study found incidental findings in 33% of patients who had received a CT of the head, abdomen/pelvis, and/or chest, and were subsequently discharged from the ED.⁴ With an estimated 80 million CTs performed in the U.S. in 2013, that is a lot of incidental findings.⁵

The number of incidental radiographic findings varies anatomically, with multiple studies showing the **greatest occurrences in the abdomen and pelvis, followed by the chest, with the fewest found in the head.**⁴ Likewise, their clinical relevance varies and depends

on a complex interplay of variables, including the organ involved, the radiographic characteristics of the finding, and patient characteristics. For example, the principal predictor of malignancy for pulmonary nodules is size.⁶ In contrast, sonographic appearance is the principal predictor of malignancy of incidental adnexal masses, while size has a much smaller association.⁷

As demonstrated by incidental pulmonary and adnexal masses, you might imagine that the approach to evaluating the clinical relevance of incidental radiographic findings varies. However, **there is one thing that seems to hold true among incidental findings in general: the majority are benign.** In a 2002 study of 1,520 high-risk smokers (>50 years old, 20+ pack years smoking), 1,049 patients had pulmonary nodules. Surprisingly, malignancy was found in only 2.6% of patients with nodules.⁸ With incidental adnexal masses, the large majority of findings in all ages are simple cysts, of which less than 1% represent malignancy.⁷

The big problem with incidental radiographic findings is that a small fraction of them will *not* be benign, and may represent early stage malignancy. Early intervention in these cases may theoretically stave off invasion, metastasis, or even death. However, **as impressive as current imaging modalities are, they remain limited both in their ability to discern malignant from benign,** and in their detection of micro metastasis.⁹ Even among people who do undergo early intervention, a subset will still have metastasized or invaded on a microscopic level, and intervention may ultimately offer no benefit.



Certainly, a minority of patients will benefit from the detection, evaluation, and treatment of what is initially an early-stage, incidentally detected cancer. For those patients, intervention may be life-saving. More commonly, the benign incidental findings may lead to workups that are not so benign. **The long-term management of these incidental findings is linked to more radiation, increased medical costs, significant anxiety, and invasive procedures such as biopsies.**^{10,11} A benign lipoma may prompt multiple CT scans, expenditure of thousands of health care dollars, and a pneumothorax as a complication of an invasive diagnostic procedure. Some patients may actually develop malignancy as a result of serial CT scans tracking the growth of a benign incidental finding. Moreover, one incidental finding may beget others. In the case of pulmonary nodules, one study estimates that 10% of patients receiving follow up imaging for an incidental pulmonary nodule will be found to have a new one.¹²

Despite the multitude of possible patient and societal harms that the downstream management of incidental radiographic findings may cause, we really only have one choice in their management. As incidental findings become increasingly common with more frequent use of imaging modalities, we must take pains to account for them and communicate their existence and meaning to our patients. Neither of those tasks is particularly easy.

There is limited data to inform us about how frequently these findings are communicated to patients. The data that does exist is less than perfect. A 2008 single-center study of trauma patients



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with incidental radiographic findings reported that only 27% of patients received an in-hospital workup, outpatient referral, or documentation of findings in the discharge paperwork.³ Accounting for incidental findings in a busy emergency department can be difficult; even more so in departments without 24-hour access to a radiologist, where incidental findings may not be detected until after patient discharge. In these institutions, a means of **flagging these delayed findings, communicating them to patients post-discharge, and documenting this process is critical for both the patient and the physicians.**

Discussing incidental findings with patients likewise offers its own set of challenges. Most importantly, we must be vigilant of them and, when identified, we must set aside time — often our least plentiful resource — for patient discussion and documentation. Patients should be reassured that incidental findings are common, and in most cases turn out to be insignificant. However, they also need to know that they potentially can be harmful, and require follow up; and, in some cases, may be as serious as early stages of cancer.

As with so many other issues, we find ourselves in the middle of a tug-of-war between health care economics, ethics and law, and our duty to our patients. Despite the vague nature of incidental radiographic findings and the many frustrations that accompany them, **our responsibility as emergency department providers is clear.** Whether we like it or not, we should account for all incidental radiographic findings and discuss them with our patients. *

Getting in Line



Promoting and expanding ultrasound's use in central venous catheter placement

Longitudinal view of the internal jugular vein showing appropriate guideline wire placement within the vessel.

Historically there have been various ways to place central lines. Ultrasound-guided

central line placement has emerged as essentially the standard of care for most line placements, as it can visualize the needle entering the vein in real time.

Various studies have proven the superiority of ultrasound-guided lines compared to using landmarks alone for placement.^{1,2} Another study showed arterial punctures were significantly reduced from 16% to 5% with ultrasound use in adults, and from 30% to 6% with ultrasound use in infants.² Alternatively, one retrospective study found that consistent use of manometry to verify central line venous placement effectively eliminated arterial injury from unintentional arterial cannulation over a 15-year period.³ Another technique involves confirming venous placement with a blood gas taken from the initial blood return after venous puncture.

Landmarks and signs such as non-pulsatile dark blood return versus pulsatile bright red blood can be used, but may be less reliable depending on the patient scenario, and so are best used in conjunction with a visual method.

Procedural techniques may differ from institution to institution and between departments within institutions. While the evidence suggests that ultrasound use provides

a superior and safer method for central venous catheterization, and it has become standard practice around the



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country, there are still some institutions and ICUs that require a pause in the procedure for confirmation with blood gas. It is less than ideal to stand sweating under a gown, trying to hold a needle or wire steady in a combative septic patient while

imaging during needle placement reduced the time to venous cannulation, and even reduced risks and complications.² Like all interventions, however, ultrasound use is somewhat dependent on operator skill level. Stone, et al. tested the use of ultrasound for confirmation of guidewire placement. Five clinicians who had all performed at least 25 ultrasound-guided central lines were shown an instructional video. Then 20 patients were enrolled, and these clinicians were asked to place central lines and confirm venous wire placement with ultrasound — both before dilation —

gated for subclavian vein catheter placement. Subclavian central line placement can be guided by ultrasound from either an infraclavicular or supraclavicular approach, and can be more successful than one might assume. There are several free teaching videos available online, and easily accessed via a simple browser

awaiting the results of a blood gas analysis. Especially when you've already confirmed placement of the line with ultrasound.

Confirming guidewire placement with ultrasound is easily done during the procedure. While not always done after the initial venous puncture, guidewire ultrasound should be standard practice. You simply visualize the needle entering the vessel, then thread the guidewire, following it in transverse and longitudinal planes. Applying pressure with visualization verifies compressibility of the vein, and rules out placement in a pulsatile artery. The same technique can be repeated to confirm placement of the catheter within the vein. If we are waiting for additional tests to confirm placement, the **chances are we are tipping the patient's procedural benefit to harm ratio in the wrong direction.** We are risking damage to other structures, and may be postponing critical patient resuscitation. Patients in need of central lines often are unstable and need immediate central access placed. No matter how seasoned you are, line placement takes some time; adding on additional unwarranted minutes to the procedure can be dangerous to the patient.

A meta-analysis looking at central line placement in children and adults with real-time ultrasound

and before catheter insertion. CVP was used as the control to confirm proper placement. The results indicated that ultrasound predicted venous internal jugular central line placement with 100% sensitivity and 100% specificity.⁴

With direct visualization of the needle or guidewire entering the vessel **we have become more successful and have had decreased procedural complications** as opposed to using just landmarks and entering blindly. Gillman, et al. collected a database of cases from September 2008 to January 2010 where ultrasound was used for internal jugular or femoral vein central line placement; the study looked at the prevalence of accidental arterial dilation during this procedure. During that time period they found that 53 central lines were inserted (21 central venous introducers, 9 dialysis catheters, and 23 multi-lumen venous catheters). There were no incidents of accidental arterial dilation or puncture.⁵ Another study involving sonographic guidewire visualization by Moak, et al. on a simulated vein showed that even novices (emergency medicine residents and medical students) were able to visualize a guidewire properly placed within a simulated vein with a high degree of accuracy. The overall sensitivity was 97.5%, and specificity was 95.0%.⁶

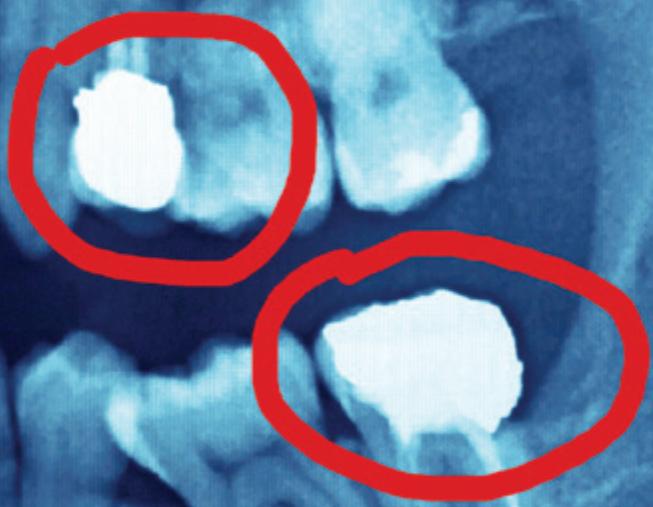
Ultrasound-guided central line placement has not only been studied for use on internal jugular and femoral vein cannulation, but it has also been investi-

search. Fragou, et al. performed a study comparing subclavian central line placement in 200 patients using ultrasound guidance versus 201 patients using the traditional landmark technique.

They found that the ultrasound group had successful placement 100% of the time, and that the landmark group only had successful placement 87.5% of the time. The procedure time was noted to be shorter in the ultrasound group, but it was not found to be statistically significant. However there were fewer total attempts and fewer complications within the ultrasound group when compared to the landmark group.⁷

While nearly all institutions now use ultrasound for confirmation of venous puncture for jugular and femoral lines, there is still room to expand ultrasound use in this procedure. **Confirmation of guidewire and/or cannula placement within the vein appears to improve procedural outcomes.** Ultrasound is also being increasingly used for subclavian access. For those who work at institutions that still require a procedural pause for other methods of confirmation, **we should advocate for proper US use and discuss the data.** Ultrasound-guided placement and confirmation of central lines is, however — like all ultrasound procedures — still an operator-dependent skill with variable results and success based on level of expertise. Nevertheless, research has shown that with the right teaching and practice, even novice residents and medical students can quickly excel in ultrasound-guided lines and confirmation, even in scenarios where it was not previously used. *

Untreated
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A TRUE **DENTAL** EMERGENCY

Since the 1920s,
54 countries have
had great success
utilizing specialty-
trained dental
therapists to provide
dental care in their
communities.

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Non-traumatic dental pain (NTDP) is a frequent chief complaint encountered by the emergency medicine resident. Recent publications demonstrate an increasing number of patients relying on the ED for their dental care.¹⁻⁴ **Between 2006 and 2009, there was a 15.8% increase in visits to the ED for NTDP.**²

The treatment of patients with NTDP is often a nerve block and/or an opiate prescription. However, untreated (or under-treated) dental conditions can progress to serious infections, such as Ludwig's angina and cavernous sinus thrombosis.⁵⁻⁷ Despite the possibility of progression to these dangerous conditions, the EM literature is focused on **curtailing opiate prescriptions, rather than focusing on interventions to treat the associated disease.**⁸ In one retrospective study of NTDP visits, 90% of patients had no procedure performed, and 81% were prescribed opiates.⁴ As the number of opiate prescriptions rises and the rate of recidivism increases, it is not difficult to recognize a growing problem.⁹

Access to dental care varies depending on where a practice is located. **Dental-related ED visits occur twice as frequently in rural areas as they do in large metropolitan areas.** This is one reason why EM residents training at large academic centers may be blinded to this growing dilemma.² Furthermore, the rate of NTDP ED visits is more than four times greater among patients from the lowest income communities than for patients in the highest income communities.²

The specialty of EM has roots grounded in public health. Through the twentieth century, medical specialties were created as the fund of knowledge increased; scientific discoveries beget doctors to deliver specialized care to the public. In contrast, **emergency medicine was born out of public need.** To this day, patients come to our doors when they need care the most. The role of emergency physicians likely will continue to change as we aim at the ever-moving target of public health needs.

This changing health care climate has stressed the importance of EM residents becoming stewards of patient health while maintaining concern for costs associated with the care we deliver. **Costs rise dramatically when dental care is provided in the hospital setting.**¹¹ In fact, research shows a ten-fold increase in costs over dental office-based preventative care for Medicaid enrollees who required inpatient treatment for oral conditions.¹² Focusing on creating cost-conscious solutions to close the growing gap in dental coverage should become a goal of emergency physicians, dentists, and policymakers alike.

Proposed solutions

In 2004, the American Dental Association estimated there were 183,430 dentists practicing in our country. Unfortunately, less than 1% of them practice in rural areas.¹³ Educating a greater number of dentists would seem to be the easiest fix, but this does not happen overnight;¹⁴ and less than 0.5% of new dental school graduates choose to practice in rural areas.¹³ The situation seems to mirror the lack of primary care physicians being produced by medical schools throughout the country.¹⁵

As a solution, both Minnesota and Alaska have created intensive educational programs aimed at advancing experienced dental hygienists into mid-level dental provider positions.^{16,17} It is unknown how this initiative has directly impacted the frequency of NTDP in hospital emergency rooms, yet it can be inferred that — with better preventative care — many visits to the ED can be avoided. Since the 1920s, 54 countries have had great success utilizing similar specialty-trained dental therapists to provide dental care in their communities.¹⁸

Unfortunately, despite success utilizing mid-level providers, many states have opposed these measures. Due to a combination of money, politics, and lack of awareness, these legislations fall off the docket with little public knowledge of their coming and going. Rather than work together, **professional organizations spend considerable time and energy fighting in the political coliseum** instead of building a solution to this growing problem.

Should EM residents promote the use of mid-level providers in dentistry? If our specialty prides itself in advocating strongly for patients within the walls of our EDs, why should we not support them in our state legislatures? The 2011 ACGME program requirements for graduate medical education in EM states, "Residents are expected to advocate for quality patient care and optimal patient care systems."¹⁹ **By showing support, EM residents can bring change to their states' health care systems by indirectly obtaining care for their patients.** As EM residents, we are taught to be team leaders in the ED. Should we not expand this role to become leaders in our communities, as well? As physicians invested in providing care to all, we must be proactive in creating a better solution for this large gap in coverage. *



Creating Safe Harbors



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Providing legal immunity for physicians who follow established clinical guidelines would create an efficient pre-trial mechanism for dispensing with frivolous litigation.

Rethinking Tort Reform

More than 75% of physicians will face a medical malpractice claim over the course of their career.¹ This experience is often emotionally and financially taxing for health care providers, with legal fees alone averaging more than \$17,130 per claim.² It is therefore not surprising that as many as 90% of physicians report practicing defensive medicine.³ Accordingly, about **2.4% of all health care dollars are spent on liability-related costs annually**,⁴ which – by some estimates – is more than the amount spent on emergency care in the U.S.⁵ By reducing costs associated with litigation and defensive decision-making, tort reform has the potential to save the health care system \$64 billion over the next 10 years.⁶

Background

For years, tort reform efforts at the federal level have focused on establishing a legal upper limit on non-economic damages, a strategy commonly referred to as “capping.”^{7,8,9} The aims were to minimize the financial incentives for lawyers to pursue frivolous claims, which would – in theory – lower medical malpractice premiums for providers. However, these reform efforts have generally not been politically viable at the federal level due to the opposition of powerful special interest groups.¹⁰ Meanwhile, individual states that have implemented payout caps have experienced mixed results; some failed to demonstrate a clear correlation between these caps and health care spending.^{11,12,13} Consequently, proponents of reform have recently embraced more sophisticated models.

An alternative approach

One alternative involves the creation of legal “safe harbors.” This approach aims to **lower health care costs and improve patient care by protecting physicians who adhere to clinical guidelines**. A recent pilot study in Oregon projected that a safe harbor model of tort reform would reduce medical liability costs by over 5%.^{14,15} Another study found that legal safe harbors would reduce regional practice variation and lead to overall improvements in health care quality.^{1,26}

Saving lives, saving costs act

The concept of utilizing legal safe harbors in medical malpractice reform was recently introduced in the U.S. House of Representatives. The “Saving Lives, Saving Cost Act” (H.R. 4106) was proposed on February 27, 2014 by Representatives Andy Barr (R-KY) and Ami Bera, MD (D-CA). **The Act’s primary components include:** (1) the requirements for guideline development, (2) the process for removing cases to federal courts, (3) the establishment of independent review panels, and (4) the creation of legal safe harbors for physicians.^{17,18}

Establishment of clinical-practice guidelines

H.R. 4106 requires eligible professional organizations, such as ACEP, to design evidence-based clinical practice guidelines that adhere to the Institute of Medicine’s Standards for Developing Trustworthy Guidelines.¹⁹ These guidelines would then be submitted to the Department of Health and Human Services (HHS) for review. The designated professional organization would be responsible for periodically maintaining and updating the guidelines as new evidence emerges. All of this material would be available free-of-charge online through the National Guideline Clearinghouse.

The idea of clinical practice guidelines is not a new concept, and ACEP has

Influencing legislation

Residents interested in influencing H.R. 4106 should consider contacting their representatives in Congress at www.house.gov/representatives/find.



already adopted nearly 20 evidence-based policies that influence clinical practice and training, covering topics ranging from pulmonary embolism to opioid use (see www.acep.org/clinicalpolicies).

Removal to federal courts

The majority of medical malpractice cases are currently litigated in state courts. During these proceedings, both sides often hire expert witnesses to testify and, eventually, the judge or jury determines the standard of care on a case-by-case basis. This process of determining the standard of care is limited by the decision-maker's lack of medical knowledge; the highly variable quality of expert witnesses; and reliance on diverse, and sometimes conflicting, sources of information.

H.R. 4106 attempts to circumvent this dilemma by creating a "safe

harbor" for physicians in federal court. Once the case is in a federal district court, the physician would be able to claim adherence to the applicable clinical practice guidelines, after which the court would be required to suspend the litigation and refer the case to an independent medical review panel.

Independent medical review panel

The medical review panel would be composed of three experts in the relevant field of clinical practice who are (1) board-certified, (2) recently actively engaged in clinical practice, teaching, or research, (3) approved by the clinician's specialty society, and (4) preferably from the region where the case originated.

The medical review panel would utilize the applicable clinical-practice guidelines as the standard of care to evaluate physician

conduct. **This provision would, in effect, create a national standard of care that would avoid the case-by-case approach currently utilized by the state courts.** The review panel would also be able conclude that deviations from the clinical practice guidelines were appropriate in individual circumstances.

Safe harbor

If the independent medical review panel determines that the physician acted in accordance with the clinical-practice guidelines, the panel's findings would be "received into evidence by the court" involved in the malpractice litigation (HR 4106). The court, in turn, would be obligated to dismiss the case in favor of the physician, unless the plaintiff could demonstrate by overwhelming evidence

HEALTH POLICY

(“clear and convincing”) that the panel of medical experts erred.^{17,18}

Status of the bill

H.R. 4106 has achieved seven co-sponsors in the U.S. House of Representatives, including three physicians. The Bill has been referred to the Committee on Energy and Commerce, and the Judiciary Committee for deliberation.^{17,18} Several organizations have already endorsed this legislation, including the American Congress of Obstetricians and Gynecologists (ACOG) and the Healthcare Leadership Council.²⁰ This legislation is currently under review by ACEP.

Although there is growing support for H.R. 4106 in the medical community, malpractice reform is opposed by trial lawyer interest groups that are influential in the Democratic Party.²¹ As a result, it is unlikely that tort reform will be enacted this year given the current composition of Congress.

“What amazed me was the amount of respect I was given and the voice I was afforded while a part of the organization,” Dr. Schmitz said. “As part of EMRA, I could walk into a meeting with CORD or ACEP, which were full of accomplished senior physicians with far more experience than I had, yet I could suggest an idea that people took very seriously and actually implemented. That unique opportunity to represent residents all across the country – and share their voice – was an invaluable learning experience for me, and helped develop and fine-tune the organizational and leadership skills that I will use throughout the entirety of my career.”

Other challenges associated with designing safe harbors

One recent analysis of safe harbors completed by the Urban Institute identified several potential difficulties associated with the development of clinical guidelines. The Institute found that the production of guidelines would be time-consuming and financially expensive.²² Additionally, it would be difficult to keep the guidelines up-to-date. The review concluded that “the speed of medical innovation may outpace the capacities of existing researchers and guideline writers to periodically review and revise them.”²²

Advocates of the safe harbor approach to tort reform argue that the incentives and resources already exist to support the efficient development and revision of clinical practice guidelines. First, many professional organizations, including ACEP, already have a mechanism for producing and revising clinical guidelines. Additionally, the Affordable Care Act

(ACA) now provides financial incentives for the development and implementation of clinical guidelines and other quality measures.²³ For example, under Medicare’s Value-Based Purchasing Program, **clinical policies that demonstrate improved patient outcomes and safety will receive higher reimbursements.**²³ Finally, significant federal funding is available for systematic reviews of best practices research through the Patient-Centered Outcomes Research Institute.^{14,24}

Conclusion

Providing legal immunity for physicians who follow established clinical guidelines would create an efficient pre-trial mechanism for dispensing with frivolous litigation. The safe harbor model may also have a variety of other positive consequences, including promoting consistency and best practices through daily use of clinical guidelines, and helping control health care costs by reducing the practice of defensive medicine. *

empower

Sharing Our Stories

Dr. Gillian Schmitz

Dr. Gillian Schmitz always thought she wanted to be an astronaut, but it wasn't long into her early career as an aerospace engineer that she realized she was far more interested in the way *people* work, than the way *software* works. This epiphany was the beginning of a young, stellar career in academic emergency medicine, where she says she has been able to satisfy her passion for teaching, research, and her diverse patient population. The current chair of ACEP's Academic Affairs Committee, Dr. Schmitz first became involved in EM leadership during her term on the EMRA board, which she contends was “perhaps the single best thing” she did during her residency.



Dr. Schmitz graduated from the Loyola Stritch School of Medicine in 2004. During residency at the University of North Carolina, where she was chief resident, she served as the academic affairs representative on the EMRA Board of Directors from 2005-2007. She was an active core faculty member and served as the assistant curriculum director for the Wilford Hall Medical Center and Brooke Army Medical Center Emergency Medicine Residency Program from 2007-2009. Dr. Schmitz was an assistant professor at the Georgetown University/Washington Hospital Center Residency Program from 2009-2011 and won numerous teaching and resident mentoring awards. She served as an assistant professor and active core faculty member at the University of California, San Diego (UCSD) Emergency Medicine Residency Program from 2011-2012 before joining the University of Texas Health Science Program in San Antonio as an associate program director.

the ethics dilemma

An ethical education and emergency medicine

There are fundamental flaws in how ethics is taught in medicine. They begin in medical school and are perpetuated throughout graduate medical education. As a subject, ethics in medical education is largely ignored. There are often lectures that will teach Beauchamp and Childress' four core principles of bioethics, and a lecture regarding research ethics, but often the discussion ends there. This may be partly due to teachers and learners not identifying ethics as important subject matter. They may also feel their personal morality will be an adequate guide in every ethically problematic encounter. Or perhaps, as a discipline, we do not know how to effectively teach or learn ethics.

Ethics stems from philosophical and religious teachings; therefore, most bioethicists have historically been philosophers or theologians. They do not have the clinical knowledge or experience to translate ethical theory to the patient's bedside and make it practical in a clinical setting. In turn, **clinicians who teach ethics often seem to equate morality with ethics** and concentrate too heavily on clinical decisions, while not identifying important ethical considerations.

There is a unique body of medical knowledge that creates the expertise of the emergency physician. Likewise, there exist unique patterns of ethical dilemmas that are regularly encountered in the emergency department. Similar to medical cases, ethics in the emergency department

is unique because decisions are based on limited information, limited relationships with patients and families, and limited patient participation. We deal with issues of direct and indirect supervision, futility, end of life, EMTALA, public safety, disaster care, triage, and care of minors, just to name a few. These cases can be identified, discussed, and learned. The proof lies in the seasoned emergency medicine physician who is better equipped to deal with difficult ethical dilemmas than the novice physician. There are clearly skills and techniques for handling these scenarios, and they should be taught to all emergency practitioners.

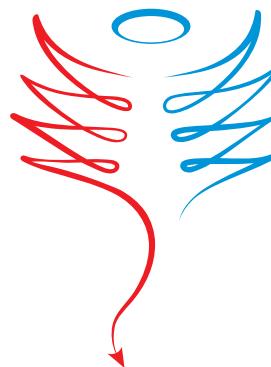
I contend that **ethics in emergency medicine can and must be taught in a comprehensive fashion**. Just a small background in ethical theory and analysis can be enough for most ED physicians to analyze ethical cases, draw conclusions, and create strategies that can be used in the acute setting. Additionally, identifying and reviewing ethical cases,



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Healthcare Network
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and pursuing continued education through repeated case discussions can solidify routine ethical approaches. This will allow residents to easily navigate common cases. Knowingly, you cannot fully prepare for all ethically problematic situations, and even common cases have subtle nuances. However, having **basic strategies and approaches already planned out for the most frequent scenarios** creates a base of knowledge and strategy that would otherwise not be available.

There are several philosophical approaches that help create a usable ethical analysis tool for emergency physicians. The first that deserves consideration are the principles set forth by Beauchamp and Childress for bioethical analysis; they include *autonomy*, *beneficence*, *non-maleficence*, and *justice*.¹ While it is important to be aware of these principles and appreciate their interplay in any given situation, there are other philosophical approaches to consider. John Rawls described a technique known as the "veil of ignorance." This technique's



Regular discussions of difficult ethical encounters can better prepare training physicians to deal with what are often the most challenging cases.

ETHICS

goal is to allow the user to ignore external factors and treat everyone the same. The **astute physician is aware they are influenced by their own biases** and susceptible to “tunnel vision” and negative heuristics. Often when we encounter a challenging clinical situation, we must take a step back, clear our minds, and re-think the case.

Immanuel Kant submits that rules are an excellent way to solve ethical problems. However, if you are going to make a rule, it should be a *universal* rule, applicable to everyone. Kant thought our duties (such as our duty to the patient) are most important, and we should make rules with our duties in mind. Jon Stuart Mill had a different approach — believing fairness was of paramount importance, and that we should strive for the best outcomes for the most people. This means Mill was concerned about the consequences of our actions, whereas Kant *ignored* the consequences and developed rules from our duties.² How this applies in emergency medicine is apparent when you encounter a patient or another physician who lives based on universal rules. We see this all the

time — take, for example, the patient’s son who states he wants everything done for his elderly mother. Now, in the setting of a terminally ill patient, with no benefit of invasive therapies, you may feel that “doing everything” is not the best course of action. Identifying the rule-based philosophy of the patient may help you discuss the case at hand. The son may not be aware of the consequences of “doing everything,” as his approach to his mother’s care is already set as a universal rule.³

Taking a number of these philosophical approaches together, Iserson created an ethical decision tool. When encountering an ethical dilemma, Iserson states you should first ask “Does a rule exist?” Is there one that could help in the presented situation? This is not unlike what Immanuel Kant would ask. **If there is no rule, Iserson suggests delaying action.** While at first this may seem like dodging an important decision, it could allow for more information to surface. In our case, family members may arrive, or paperwork — such as an advanced directive — may show up. If you have time to delay, it may be an excellent strategy.

If you cannot delay, Iserson suggests applying three rules to your action in question. One, taken from Jon Stuart Mill: **Impartiality** — would you be willing to have this action performed if you were in the patient’s place? Two, taken from Immanuel Kant: **Universalizability** — would you be willing to use the same solution in all similar cases? And third, taken from Gauthier: **Interpersonal justifiability** — would you be willing to defend the decision to others, to share the decision with the public?⁴

Regular discussions of difficult ethical encounters can better prepare training physicians to deal with what are often the most challenging cases. A simple approach to ethical analysis and a basic knowledge of ethical principles can allow all participants to identify important ethical considerations and discuss them effectively. There are resources available for most EM programs, including hospital ethics committees, local organizations that specialize in bioethical issues, and online resources such as the writings from SAEM and ACEP on ethics in emergency medicine. *

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M. Shayne Ruffing
CLU, ChFC, AEP
Managing Director
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This time of year always prompts discussion regarding the subject of transition. As I visit emergency departments and medical groups throughout the country, there are three topics about which I consistently receive questions.

Inquiring minds seem to want to know:

- ✓ How to evaluate and purchase appropriate disability insurance
- ✓ How to plan for retirement now and in the future
- ✓ How to allocate increased income

I hope that the following summary provides you with **confidence, education, and awareness** as you make decisions for yourself and your families.

Disability insurance for emergency residents

There are plenty of good opportunities for disability insurance in today's marketplace; however, **misinformation is abundant**. The bottom line is that in the field of emergency medicine there are six very competitive contracts in most states. The competitive features to understand are:

Own occupation definition of disability

— Each of these contracts will consider you totally disabled if you can not perform the substantial and material duties of *your* occupation, regardless of outside income or earnings. Understand that although disability claims are unique situations, they are handled in a similar way by every company. **All companies want to pay as much as an insured is eligible for, but certainly not more than is reasonable.** An own occupation contract does not guarantee that you will receive full benefits in every situation, but it does offer the most comprehensive, flexible level of income protection in the most diverse set of potential claim scenarios.

Benefit limits — This is where current residents really benefit. Currently, a resident or fellow within the last six months

of training can obtain up to \$7,500 of tax-free monthly income protection. Obtain this prior to completing training and you may be able to start in practice with greater than 100% of your net income insured. This is well above the normal industry guidelines, but the opportunity expires as soon as you complete your training.

comfortable making your own investment decisions, pay someone for their expertise.

Reduce income taxes — As income goes up, so does your relative tax bracket. Look for 403(b), 401(k), 457 and SEP IRA plans to allow for significant tax reduction. If you are self-employed, the SEP IRA or

You have (money) QUESTIONS We've got ANSWERS



Out-of-pocket cost — Price is always an issue, of course, but the relative benefit cost is as low as it has been in 14 years. **For the most significant price reductions, obtain disability as a group of at least three people.** Males can save 10-12%, and females can save 45%!

A competent disability advisor will be able to compare multiple contracts, design an appropriate strategy, and negotiate the terms of the contract(s) if there are any medical complications. For more detailed information on this topic, review the disability filter video, located at: www.integratedwealthcare.com/physician-strategies/emra-members.

Retirement planning

After years of minimal income and delayed gratification, the transition into practice offers the opportunity to finally make up for lost ground. There are three things to understand about retirement planning:

Set a goal — You need some understanding of what you want to accomplish, and when. This will validate the amount of ongoing retirement contributions, as well as guide the investment structure.

Invest appropriately — Try to achieve maximum growth with minimal risk. This can be a complex topic, so if you are not

solo 401(k) allow for very high pre-tax contributions.

Allocating income

Whether you are juggling a house-staff salary or looking to allocate a higher level of practice income, take some time to create a budget. For quantifiable objectives, such as a home down payment, vacations, and emergency savings, **create a separate account at your bank for each goal and contribute a fixed monthly amount via bank draft.** For retirement, education for children, debt repayment, and other larger items, develop an end goal and make contributions that are in line with those objectives.

Having a well-planned budget will allow you to maximize available income, minimize income taxes, and maintain confidence in your personal financial situation. *

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What's Holding Up My Examination Results?

One of the most common questions newly graduated residents pose to ABEM is why it takes so long to receive their qualifying examination results.

Scoring and reporting an ABEM examination includes several time-intensive checks, completed at both the level of the individual test questions and for the examination as a whole. The types of checks undertaken include the following:

- Checks of the data from Pearson VUE are completed to ensure that all of your answer responses reached ABEM as you entered them.
- The collective results are used to evaluate whether each question is appropriately contributing to our knowledge of your ability. For example, we statistically test each question to see if it discriminates between candidates who know more, and those who know less. If a question doesn't discriminate properly, or is unusually easy or difficult, the question might be deleted from scoring. The deletion of a single question requires an adjustment of the scoring for every examination.
- Because it is several months between deciding which questions will be on an exam–ination and the actual exam administration, a final review is conducted by clinically active emergency physicians. The physicians review the statistical results and every candidate comment to ensure that the test questions are still clinically relevant and of high quality. A decision is then made on which of the questions will be scored. Typically, two to four questions are dropped from the scoring based on this review.
- After the final list of questions is determined, and the examination is scored by the computer, several calculations are done by hand to ensure that the computer-generated scores are correct.
- After scoring, the different versions of the examination are compared to each other and to versions given in previous years to adjust for the overall difficulty of that examination version. A statistical process called equating is done to make sure scores are fair for all

candidates, regardless of which version of the examination they are taking.

- A summary of the results is then forwarded to the executive officers and examination editors of the ABEM Board of Directors, all of whom are clinically active emergency physicians, for review and approval.
- If the results are approved, the scores are uploaded into ABEM's central database and checked to make sure the correct scores were uploaded, and that each score is associated with the appropriate candidate. Score reports are then generated and proofed for accuracy.
- Before the results are mailed to candidates, each packet of information is checked to be sure only that candidate's information is in the packet, ensuring total confidentiality.

ABEM's scoring and reporting process consists of iterative steps and redundant checks to ensure a fair, valid, and confidential examination for every ABEM candidate. There are testing methods that are able to produce results very quickly, such as on the same day or within a few days of an examination administration. These methods, however, require thousands of candidates to be accurate, and would not allow us to make those last, important checks to be sure the questions are still relevant and high quality.

ABEM policy requires that examination scores be distributed to candidates within 90 days of an examination. However, examination results are now routinely sent to candidates between 30 and 45 days of the exam. ABEM understands that you are eager to receive your results, but wants to ensure that the results best reflect your actual knowledge, and that the examination is accurately measuring the Board's certification standard.

If you have a question you would like ABEM to write about, send an email to communications@abem.org, or call 517.332.4800, ext. 345.

New Video! A link to a short informational video about the new enhanced format for the oral certification examination (eOral) is available on the home page of the ABEM website at www.abem.org.

In-training Examination

You may recall an ABEM article published last year in EM Resident that detailed the consequences associated with cheating, including any discussion of examination questions, on the qualifying (QE) and oral certification examinations. Because these consequences are especially severe —including being barred permanently from certification, having participation in an ongoing examination terminated or results withheld, and having a certificate revoked — some residents might feel wary of discussing any topic associated with the in-training examination, as well.

However, the ABEM policy related to cheating on the in-training examination is different from the policy related to the QE and oral certification examinations: the policy related to the in-training examination allows residents to discuss examination content so long as test questions are not used or shared in any written or recorded form. ABEM's rationale for making this distinction is rooted in the educational nature of the in-training examination. Since the examination's stated purpose includes an educational component, residents are allowed to discuss examination content with faculty and fellow residents following the examination to learn as much as possible from the experience. In fact, one could argue that ABEM encourages such conversations by providing relatively extensive content-oriented feedback to both program directors and residents as part of the examination results. Please continue to discuss the content of the annual in-training examination and use it as a learning tool in your residency journey.

If you have any questions about this or any other ABEM policy, please email or call us at abem@abem.org, or 517.332.4800.

REMINDER!

The 2014 QE examination will be given November 17-22, 2014.

EM Resident Correction

EMRA regrets an error in the article "Nose Dive, Sniffing Out Mucormycosis," which was published in the April/May issue of *EM Resident*.

The article was incorrectly attributed to Drs. Dan Nguyen and Sajid Khan. It was, in fact, co-authored by resident **Dr. Dan Nguyen** and faculty member **Dr. Payal Shah**, both of Beaumont Hospital in Royal Oak, Michigan.

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CASE 1

Patty Smith, RDMS
University of Cincinnati
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Cincinnati, OH

The patient

A 44-year-old male with a history of **upper extremity DVT and MRSA positivity** presents with a constant, throbbing left wrist and forearm pain. He denies any trauma to

the affected extremity, and has no complaints of fevers, nausea, or recent illnesses. He has normal vital signs.

Exam shows dorsal erythema over the wrist with pain with both active and passive flexion and extension of the wrist. No deformities, loss of nerve function, or limitations of movement. A **bedside ultrasound** is performed to aid diagnosis.

What's the diagnosis?



All patients with infectious tenosynovitis should be admitted and given intravenous antibiotics.

What's the Diagnosis?

ANSWERS ON PAGE 50

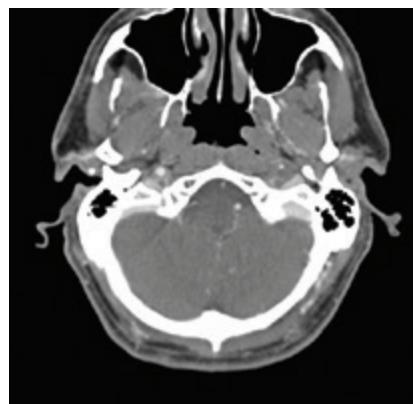
R. Jason Thurman, MD
Vanderbilt University
Author of *Atlas of Emergency Medicine*
Nashville, TN

Chris Champion, MD
Vanderbilt University
Nashville, TN

CASE 2**The patient**

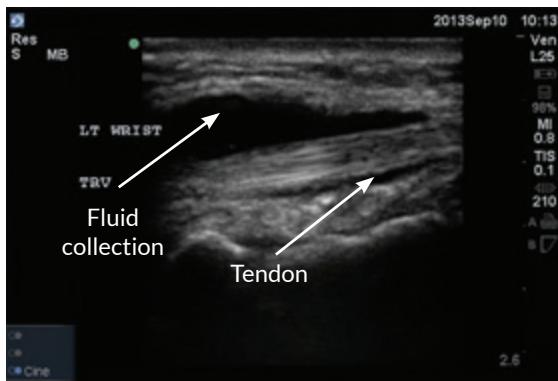
A 42-year-old male presents to an urban tertiary care ED with a **two-week history of left eyelid droop and headache**. His headache is primarily left-sided, and he noticed the eyelid droop two days after the onset of his headache. He originally presented to an outside ED and underwent a negative non-contrasted CT of the head. He was then referred to a neurologist and had a normal outpatient MRI/MRA of the brain. As his symptoms persisted, he decided to seek emergent care. On presentation his examination is remarkable only for the findings seen in the images provided. Due to his history and findings, a **CT angiogram of the neck was performed, with findings as shown**.

What's the diagnosis?



IMAGES PROVIDED BY R. JASON THURMAN, MD

WHAT'S THE DIAGNOSIS? ANSWERS



CASE 1

The diagnosis

This patient has **infectious extensor tenosynovitis**. This is an infection of the extensor tendons of the wrist and hand, typically caused by *Staphylococcus* or *Streptococcus* species.¹ The tendon runs through a synovial sheath, which allows it to glide through its range of motion. With inflammation of this synovial sheath, the patient experiences difficulty or pain with extension of the digit. Infection in this sheath can be potentially devastating, as it can cause permanent loss of function of the digit.³ A physical exam is sometimes enough to make the diagnosis, but in cases where there is some ambiguity, bedside ultrasound can be used as an adjunct.

Elevated pressure within the tendon sheath can affect the circulation to the tendon, causing necrosis.² **All patients with infectious tenosynovitis should be admitted and given intravenous antibiotics.** A consult to hand surgery is always warranted, since most will require surgical incision and drainage.¹ The patient in this scenario was started on double coverage IV vancomycin and clindamycin, and taken for operative drainage. He was found to have suppurative tenosynovitis of multiple extensor tendons. Intraoperative cultures later grew out *Serratia* and *Staph*. He was able to make a nearly complete recovery with only minimal loss of thumb extension. *

CASE 2

The diagnosis

Horner's syndrome secondary to left internal carotid artery (ICA) dissection. A painful headache with Horner's syndrome is present in 44% of extracranial ICA dissections.^{1,2}

Interestingly, along with the left ptosis and miosis seen in the images, the patient complained of left forehead anhidrosis, demonstrating a full Horner's syndrome. CT angiography confirmed his ICA dissection as the etiology of his symptoms (note the markedly narrowed lumen of the left ICA as opposed to the right). Other causes of Horner's syndrome include strokes, cervical trauma, cavernous sinus pathology, malignancies, or any other interruption of a three-neuron sympathetic pathway.³ **Workup in the ED involves imaging targeted toward suspected underlying etiologies, typically involving neurovascular imaging of the head and neck.** In children, the presence of acute Horner's syndrome should prompt evaluation for tumor, especially paraspinal neuroblastoma.⁴⁻⁵

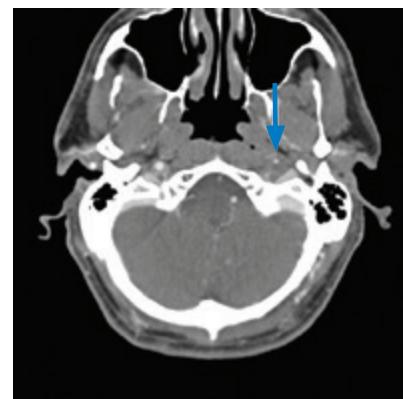


IMAGE PROVIDED BY R. JASON THURMAN, MD

UPCOMING EVENTS



EMRA/ACEP Health Policy Mini-Fellowship Application Deadline



ACEP Teaching Fellowship Dallas, TX



EMRA Travel Scholarships to ACEP14 Deadline



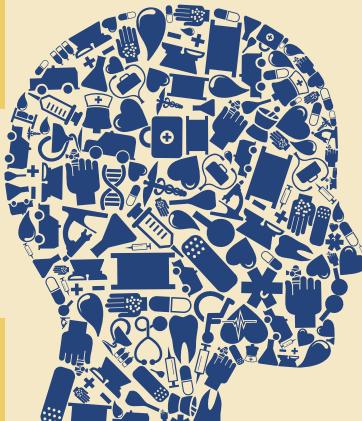
EMRA Board Applications Deadline



EMRA Fall Awards Deadline



ACEP14 Chicago, IL



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.

1. Which of the following is a possible cause of dyspnea?
 - A. Hyperglycemia
 - B. Hyperkalemia
 - C. Metabolic acidosis
 - D. Metabolic alkalosis

2. A 53-year-old man undergoing radiation treatment for prostate cancer presents with bloody diarrhea, tenesmus, and occasional stool incontinence of 3 days' duration. Vital signs include blood pressure 130/82, pulse 82, and temperature 37°C (98.6°F). The abdomen is soft. Rectal examination produces diffuse tenderness, good tone, and bright red blood. Lower extremity strength, reflexes, and sensation are normal. Which of the following is the best management plan?
 - A. Analgesics and sucralfate
 - B. Empiric ceftriaxone, doxycycline, and acyclovir
 - C. Oral steroids and mesalamine
 - D. Surgical consultation for incision and drainage

3. Which of the following materials is most damaging in penetrating intraocular injury?
 - A. Glass
 - B. Lead
 - C. Plastic
 - D. Wood

4. A 58-year-old woman presents by ambulance with sudden shortness of breath. Paramedics administered two doses of nitroglycerin 0.4 mg sublingually and furosemide 80 mg IV. She has a history of hypertension and chronic renal disease. Vital signs include blood pressure 150/78, pulse 118, respirations 32, and oxygen saturation 88% on room air. Physical examination reveals crackles diffusely and bilateral lower extremity edema. An ECG reveals sinus tachycardia and no acute ischemia. Which of the following should be administered to decrease the need for intubation?
 - A. Aspirin 325 mg orally
 - B. Ipratropium 0.25 mg by nebulizer
 - C. Milrinone drip
 - D. Noninvasive positive-pressure ventilatory support

5. Which of the following illnesses does hantavirus most commonly cause?
 - A. Encephalitis
 - B. Hepatitis
 - C. Influenza-like illness
 - D. Myocarditis

Answers
1. C 2. A 3. D 4. D 5. C

PEARLS AND PITFALLS



From the September 2013 issue of *Emergency Medicine Practice*, “Evaluation And Management of Bradydysrhythmias in the Emergency Department.” 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 initial ECG looks fine, and I’m not that impressed with the history. I’m sure the patient is fine.”

Many bradydysrhythmias are transient and intermittent in nature. Upon initial evaluation, it is not uncommon to have a normal ECG and an asymptomatic patient. Don’t make any final decisions based on a single ECG. Two ECGs are better than one, and continuous monitoring in the ED is even better.

- 2** “I know she passed out at home, but she looks fine now, and she really wants to go home.”

It can be tempting to discharge an asymptomatic patient home, especially if she is eager to leave. Remember that the absence of symptoms now does not mean there will be no recurrence. Make sure that there is a clearly identifiable (and reversible or avoidable) cause of symptoms if you plan on discharging a patient home.

- 3** “I didn’t check the medical record because he said this has never happened before.”

With the pervasiveness of electronic health records, it is becoming difficult to justify failure to review a patient’s records of previous encounters. Patients may not be able to accurately answer whether they have had dysrhythmias in the past. A quick review of the record may uncover additional history that can make a big difference.

RISK MANAGEMENT PITFALLS EMERGENCY DEPARTMENT BRADYDYSRHYTHMIAS



- 4** “I was so focused on the bradycardia that I totally missed the ST changes in the inferior leads.”

Inferior ischemia and myocardial infarction are frequently associated with bradydysrhythmias. Don’t forget to scan through the inferior leads of the ECG to make sure the patient doesn’t need emergent revascularization.

- 5** “It looks like second-degree type II block on the ECG. We can probably admit him to the floor.”

Even if the patient appears asymptomatic now and a majority of the beats are being conducted, remember that, in certain settings, second-degree type II blocks can rapidly degrade to complete heart block. Strongly consider admitting the patient to an intensive care unit for closer monitoring.

- 6** “I didn’t even think to ask about travel history or tick bites.”

Infectious causes of bradydysrhythmias, including Chagas or Lyme disease, may not be common if your ED is not within an endemic area; however, for patients who have lived in or traveled to endemic areas, asking about this may identify the underlying cause.

- 7** “We were so busy focusing on the therapy that I overlooked the fistula in the patient’s arm.”

Clues to the underlying cause of the conduction abnormality may be evident on examination. Make sure you look for evidence of

dialysis catheters or fistulas if you are considering the likelihood of hyperkalemia.

- 8** “He said he had been on the same digoxin dose for the past few years, so I didn’t check.”

In the setting of digoxin therapy (which is known to cause bradydysrhythmias), don’t forget to check drug levels. If recognized as the offending toxin, antibody antidote therapy may be the only treatment for the dysrhythmia.

- 9** “A heart rate of 45 beats/min in a 25-year-old? I can’t find a reason for her to have any cardiac disease.”

Not all causes of bradydysrhythmias are cardiac in nature. Don’t overlook intra-abdominal pathology as a potential cause. Broaden your differential to include these reflex-mediated syndromes.

- 10** “I was so pleased I could explain the patient’s syncope with the sinus bradycardia that I completely missed the other injuries.”

Although the evaluation and identification of syncope are important to signal bradydysrhythmia as a potential factor in trauma, do not overlook other injuries the trauma patient may have sustained. Especially in the elderly, be sure to evaluate for extremity fractures, head trauma, and other injuries following syncope and falls. *

RISK MANAGEMENT PITFALLS ELECTRICAL INJURIES IN CHILDREN



From the September 2013 issue of *Pediatric Emergency Medicine Practice*, "An Evidence-Based Approach to Electrical Injuries in Children." 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 know the child was struck by lightning, but he has no external burns, so I thought he could be discharged."

The electrical current can penetrate deeply and cause deep tissue destruction even in the absence of extensive surface-area burns. As noted by a study by Tarim and Ezer, the cross-sectional area of the burn is inversely related to the depth/extent of tissue injury.³⁹ This is especially true in patients with lightning and high-voltage injuries. You should consider admitting the patient because there may be deep tissue destruction that is not externally visible.

- 2** "She had a femur fracture on examination, but I didn't see any other injuries, so I didn't get any further imaging."

The American Burn Association does not support the administration of prophylactic antibiotics to every patient with a burn; the use of antibiotics should be reserved for those who develop infected wounds.

- 3** "The child had an electrical burn at the oral commissure. She did not require follow-up with any medical provider, because these types of burns heal without any complications."

Patients with minimal burns to the oral commissure usually do not require extensive diagnostic evaluation or admission to the hospital; however, patients with moderate to severe burns of the oral commissure should be promptly referred to an oral or plastic surgeon because the burn may extend deeper than the superficial layer. The surgeon may place a stent to minimize future scarring. Patients with burns at the oral commissure secondary to chewing on an electrical cord are at a high risk of delayed bleeding from the labial artery 2 to 21

days after the initial incident. Inform the parents of this potential complication prior to discharge.

- 4** "Even though the patient was electrocuted after touching the third rail, his initial ECG was normal, so I sent him home."

The third rail is the high-voltage electrified rail that provides power to a railway track. All patients with high-voltage injuries should be admitted for cardiac monitoring. Although late dysrhythmias are rare (especially if the initial ECG is normal), high-voltage electrical exposure is an important risk factor for developing a cardiac abnormality.

- 5** "The adolescent who was struck by lightning was observed in the hospital for 2 days and had a normal examination, so I arranged follow-up only with the primary care doctor."

Cataracts are a known complication secondary to lightning strikes. There may be a delay in the development of these cataracts. All lightning-strike victims should be referred for ophthalmologic evaluation. These patients are also at high risk for tympanic membrane rupture and should have a formal evaluation by an otolaryngologist during or immediately after their inpatient stay.

- 6** "As an EMS provider, I encountered 2 adolescents who had been struck by lightning. One was injured with severe burns to his legs, and the other was unresponsive and pulseless. I attended to the burn victim and pronounced the other victim dead at the scene without any further intervention."

The traditional rules of mass triage do not apply to victims of lightning strike. Even patients who are in cardiac arrest at the scene have a high chance of survival with immediate and prolonged resuscitation; therefore, they should be attended to first.

- 7** "I think this 6-year-old child with 12% burns can be admitted to my community hospital."

According to the American Burn Association, any patient with > 10% surface-area burn should be transferred to a burn facility for consultation by a burn specialist and further monitoring.

- 8** "A teenage boy was found near some downed wires. On physical examination, he was well hydrated, so I did not start intravenous fluids, although the urine appeared brown. I wanted to wait for the test results."

Victims of high-voltage electrical injuries are at high risk for developing rhabdomyolysis. The literature shows that these patients have better outcomes if intravenous fluids are initiated early in the course of treatment.

- 9** "The girl who was struck by lightning had a normal mental status and neurological examination on initial presentation to the ED, so I discharged her home to follow up with her primary care provider in a few days."

All victims of lightning strike should have repeat neurologic examinations while inpatients, since they are at risk for developing cerebral edema several hours after the insult. Upon discharge, the patient should be referred to a learning specialist for periodic testing to ensure cognitive clarity.

- 10** "Although the adolescent appeared well after being "tased" by police, I wanted to admit him because it was a high-voltage exposure."

Electrical exposure by electrical weapons causes minimal physical harm, since the exposure is typically brief and a low amperage. Asymptomatic patients do not require extensive diagnostic testing, ED observation, or admission. *

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RADIOLOGY (P. 34)

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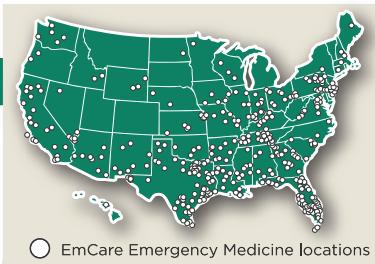
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Albany area: Albany Memorial Hospital has a newer ED that sees 44,000 pts/yr. and hosts EM resident rotations. Samaritan Hospital in Troy is a respected community hospital, minutes from Albany, which also treats 45,000 ED pts/yr. Outstanding partnership 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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OHIO

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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.

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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.

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 weekend shift differential, 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.

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, weekend shift differential, 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.

OKLAHOMA



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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

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.

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

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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 (jnicholas@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

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.

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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