

EM Resident

Official Publication of the Emergency Medicine Residents' Association

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VOL 40 / ISSUE 3



Stroke Signals

*Thrombolytics in
Acute Ischemic Stroke*

Tragedy & Triage

*Saving Victims of
the Boston Bombings*

History Lessons

*A Perspective of
EMS in the U.S.*





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We are pulled into love, pain, delight, heartbreak, and fear – all in one shift. It is an experience like no other.



Cameron Decker, MD
EMRA President
Baylor College of Medicine
Houston, TX

Emergency medicine is a specialty that offers an unparalleled view into humanity. On a daily basis, we are thrust into situations in which we witness (and often play a role in) so many raw emotions. An assault victim's innocence is shattered when she realizes her neighborhood is no longer a safe place to make her morning run. A terrified mother pours tears of joy upon receiving the news that her child will survive. A heartbroken man says goodbye to his partner who struggled with cancer, marking an end to decades of beautiful memories. No time is

better than these next few months of great change to reflect on and share this fact: we have been given front row tickets to the *real* greatest show on earth.

As we prepare to send our graduating residents off to fellowships or practice, EMRA would like to extend its sincerest appreciation for the countless hours you have contributed to the specialty and your patients. We residents don't hear the words "thank you" as frequently as we deserve. We work intense shifts often with violent, verbally abusive patients. We persevere for many reasons, but for some, it is the *non-medical* lessons we have learned that are the most rewarding. There is no other profession in which you will experience the realities of life in such extremes. Our interactions transcend all social classes. Our view into others' lives is not often obscured; we're faced with pure, harsh reality. These are the lessons that will stay with us long after we've forgotten the components of a PORT score.

With the departure of our senior residents, we now have the opportunity to welcome a fresh set of minds. I challenge our new interns to spend the next year not only learning about the management of DKA or perfecting intubation techniques, but also appreciating the powerful perspective

you have been offered. Open your eyes to the emotional experiences your patients are undergoing. Treat the person, not the disease.

Equally important, we welcome a new wave of eager medical students. Recruiting strong future physicians into the most incredible specialty that exists is YOUR job. There are so many inimitable facets of emergency medicine – from the variety of patients we see to the lack of call; we should not forget to share the unique features of our specialty with our undecided medical student colleagues.

To new clinical medical students, the emergency department can appear to be a stressful environment full of violence, tragedy, and abuse – a scary place. You must be the one to open their eyes to the incredible opportunity that exists. No other specialty affords you the chance to deeply connect with so many lives in such a short period of time. We are pulled into love, pain, delight, heartbreak, and fear – all in one shift. It is an experience like no other.

Whether walking off stage or entering the ring, take a moment to reflect on how emergency medicine truly is the greatest show on earth. As you do so, don't forget to share your front row tickets. ★

EM Reimagined

EMRA's flagship publication gets a makeover



Stephanie Krema, MD
Secretary/EM Resident Editor-in-Chief
University of Louisville
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Like EMRA itself, EM Resident has grown considerably since its humble beginnings in 1974. Once a simple newsletter, it has seen many iterations (above) and has developed into the organization's flagship publication with a readership of nearly 12,000.

If your mailbox looks anything like mine, it's packed with emergency medicine subscriptions. Besides *EM Resident*, I count *seven*. That's a lot of reading for folks without a lot of free time – yet you've made it to sentence three of this article, and I think that's swell.

In the 39 years *EM Resident* has existed, it has never appeared so colorful and sleek. Sure, it's what's inside that counts, but why not make it good eye candy, too? We want it to be interesting, relevant, and helpful while avoiding your run-of-the-mill didactic text.

The basic structure of the magazine has remained the same, but the components are moving parts that change according to the needs of emergency medicine residents. For example: We have the **Landmark Articles Series**, a fantastic way to compare, contrast, and *learn* the most pertinent emergency medicine literature. These smart chaps who author the series have cleverly whittled off the excess chitchat and summarized *what you need to know* to practice evidence-based medicine.

Other newly added sections include **Wilderness Emergency Medicine**, where those leading the way in board-certified fellowships will educate the rest of us with less wilderness medicine exposure. The newly initiated EMRA Wilderness Emergency Medicine Committee members will author the first several articles, which we hope will motivate others (hint) to follow their lead!

EMS, better known to all of us, has started off by showing us the rich history of the specialty. We'll continue to learn more about how to participate in our own communities. It, too, is a recent and exciting addition to the list of emergency medicine subspecialties!

We're also proud to share an incredible story about tragedy and healing, as told by two emergency physicians who treated victims of the recent Boston Marathon bombings.

Of course, as the magazine grows, so must the **Editorial Advisory Committee**. This is where you come in. Of the nearly 12,000 EMRA resident members, there are now six of us keeping this magazine alive. EMRA's staff editor, Rachel Donihoo, has been with us for almost a year, performing communications wizardry that makes my heart swell. Between all of us, we read resident and student contributions, ensure they're right for you, and shine them up a bit to make them print-ready. We also recognize areas the magazine hasn't yet focused upon and find residents ready and willing to teach the other 15,999 of us. It's a fun gig.

Interested in educating the masses? Have a penchant for reading? Come on in; the Editorial Advisory Committee welcomes you.

For those with experience in the editorial process – be it in undergrad or med school or at *Knitter's Monthly* – consider sharing your expertise with the rest of us. My position – **EMRA Secretary and EM Resident Editor-in-Chief** – is up for election at ACEP in Seattle this October. Think about it.

We also have **Section Editors**, who track down, collect, or pen respective section articles themselves. As of now, we have *Pediatric EM*, *Toxicology*, *Ultrasound*, *Critical Care*, *Education*, and *Medical Student Section* Editors. We'd love to add an **EKG Section Editor**, too (hint).

As always, keep sending in your articles. We want to hear what you have to say.

We are incredibly proud of the great changes underway, and can't wait for you to dive into everything *EM Resident* has to offer. Smart, modern and good-looking – just like all of you – we're confident that it will continue to be your go-to source for all things emergency medicine.

Happy reading! ★

COME TOGETHER

Emergency Medicine and the ACA



John Anderson, MD
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When President Obama signed the Affordable Care Act (ACA) in 2010, the law created a timeline with key components that would be implemented over a five-year period. New objectives were phased in every year. In late 2012 and early 2013, several of these issues important to the practice of emergency medicine – and medicine in general – took effect.

In October of 2012, the ACA established two key features—an emphasis on value-based purchasing (VBP) and electronic health records (EHRs). Medicare payments now include VBP measures that provide financial incentives aimed at improving quality of care. Hospitals will be rewarded for both performance on these measures and improvement, as determined by relatively simple formulas outlined by the Centers for Medicaid and Medicare Services (CMS). Specific examples relevant to the emergency department include percutaneous coronary intervention (PCI) for STEMI within 90 minutes of hospital arrival, appropriate discharge instructions, and appropriate initial antibiotics for immunocompetent patients with community-acquired pneumonia (CAP). Additionally, performance within this program will be

publically reported and is available at: <http://www.hospitalcompare.hhs.gov>.

EHRs first became prominent with the Recovery Act and HITECH Act of 2009. Those legislations created incentive programs for “*meaningful use*,” including e-prescribing, recording advanced directives for patients over 65, and computerized order entry. Failure to comply by 2015 would result in penalties. In contrast, the ACA focuses on increasing reimbursement (incentives) to those who use EHRs. Together, these EHR laws aim to decrease administrative and other costs, reduce errors, and contribute to improved overall delivery of care.

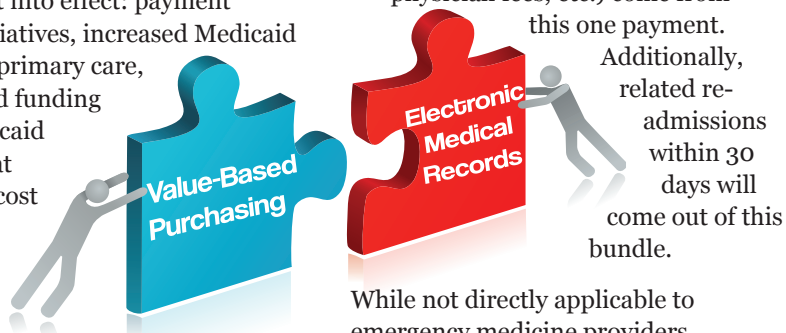
In early 2013 several other key components went into effect: payment bundling initiatives, increased Medicaid payment for primary care, and increased funding to state Medicaid programs that provide low-cost preventative care. Last year, CMS solicited proposals from hospitals to pilot bundled care programs.

In late January, the following programs with relevance to emergency medicine were announced:

1. **Gain Sharing Model.** For inpatient stays in acute care hospitals, Medicare will pay physicians based on fee for service (FFS) and will pay hospitals a discounted rate. If savings are incurred through redesign efforts by providers, both the hospital and provider may share in savings.
2. **Retrospective Acute Care/Post-Acute Care.** Both the inpatient stay and post-acute care and related readmissions for 30, 60 or 90 days post discharge for specific

diagnosis-related groups (DRGs) will be reimbursed based on a target price; this will include hospital and physician fees. Payment and savings can be shared among all participants.

3. **Retrospective Post Acute Care.** The episode or “bundle” begins at discharge to 30 days and will include related readmissions for 30, 60 or 90 days for the same group of DRGs. This option is similar to the previous one with regard to reimbursement and sharing of savings.
4. **Acute Care Only.** Hospitals prospectively are paid a predetermined amount by CMS for an acute care stay. All costs and reimbursement (hospital costs, physician fees, etc.) come from this one payment.



Additionally, related readmissions within 30 days will come out of this bundle.

While not directly applicable to emergency medicine providers, increased payment for primary care also goes into effect this year. As most emergency physicians can attest, a large portion of primary-type care is provided in the emergency department. This has sparked debate; some argue that emergency physicians should be reimbursed at similarly increased levels.

The ACA continues to grow in scope as additional components come online. Some have the potential to immensely impact the future practice of emergency medicine. One of the ACGME milestones is **Systems-Based Practice**. By understanding the specifics, we can be prepared to operate in this new environment and benefit our patients, our specialty, and the health care system. ★

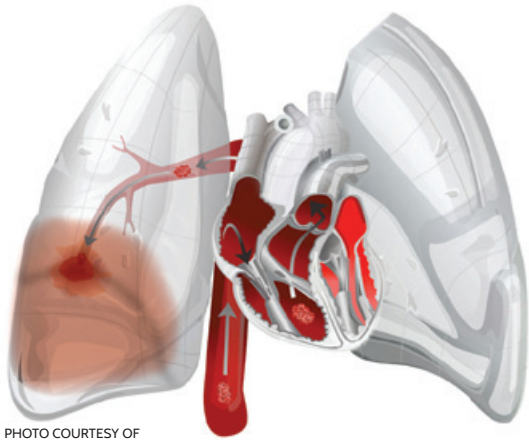


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MANAGING SUSPECTED DVT & PE

As vague and varied as the presentation of a PE may be, there seem to be just as many ways to evaluate for one.

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In this third installment of the EMRA Research Section’s “Landmark Article Series,” we take on a subject that seems to creep its way into nearly every differential diagnosis in the emergency department: deep vein thrombosis (DVT) and its most dreaded complication, pulmonary embolus (PE). As vague and varied as the presentation of a PE may be, there seem to be just as many ways to evaluate for one. As early as medical school, we learned about the myriad of tools and criteria available to guide us, but the stats can get lost in the middle of a long shift. The management of these complaints is highly variable; published data can guide one’s decision-making process.

In this article we will review three essential papers on the diagnosis and management of deep vein thrombosis and pulmonary embolism – both very common, complicated, and costly burdens faced by the emergency medicine physician.

Paper #1: D-dimers for DVT?

This 2003 article from Wells et al., “Evaluation of D-dimer in the Diagnosis of Suspected Deep-Vein Thrombosis,” addresses the most notorious of lab tests – the *D-dimer*. The study investigates the efficacy of D-dimer testing in excluding the need for further ultrasonography follow-up for unlikely (but suspected) DVT. More than 1,000 patients gathered from outpatient centers and EDs were classified as either *likely* or *unlikely* to have a DVT using the Wells Criteria.

A score greater than or equal to *two* classified a patient as *DVT likely*. Patients then were evaluated with ultrasonography alone, or had a D-dimer followed by ultrasound. (An ultrasound was not performed if the D-dimer was negative and DVT was clinically unlikely.)

Researchers found that, for the patients with a low pre-test probability for DVT, D-dimer testing had a *negative* predictive value of 99.1%, but a *positive* predictive value of only 14.1%. The negative predictive value was 89%; the positive predictive value was 38.6% for the patients with a high pre-test probability.

The Take Home

A negative D-dimer reduces the need for further ultrasound imaging workup of suspected DVT.

Paper #2: Wells Criteria for Suspected PE?

In keeping with the theme of the beloved Wells criteria, the next study we look at is “Prospective Validation of Wells Criteria in the Evaluation of Patients with Suspected Pulmonary Embolism,” by Wolf, et. al. The 2004 study examines inter-rater reliability of the Wells criteria in determining the pretest probability of patients with suspected pulmonary embolus in the emergency department. Patients who underwent imaging for suspected PE had two D-dimer assays performed, and the physician and a trained research assistant blindly evaluated the patients’ Wells criteria.

Moderate inter-rater agreement was demonstrated when patients were stratified into either low, medium, or high pretest probability groups; the agreement was substantial when split between PE-likely or PE-unlikely. Prevalence of PE among the low, medium, and high probability groups were 2%, 15% and 43%, respectively.

The Take Home

Emergency physicians can confidently use the Wells criteria to predict the pretest probability of PE in patients presenting to the emergency department.

Paper #3: Thrombolytics for PE?

Our final paper, a *Cochrane Review* by Dong, et al., argues that the standard conservative therapy of anticoagulation may not be enough of an intervention in an unstable patient. This 2009 review, “Thrombolytic Therapy for Pulmonary Embolism,” sought to evaluate the safety and efficacy of thrombolytics in acute, massive PE when a patient is hemodynamically unstable.

Eight trials with a total of 679 patients were included in the findings. The use of thrombolytics compared with heparin alone or placebo and heparin was associated with non-significant decreases in mortality, recurrent PE, or increases in major and minor bleeding events. The use of thrombolytics and heparin versus heparin alone did, however, significantly reduce the need for further treatment of in-hospital events and was associated

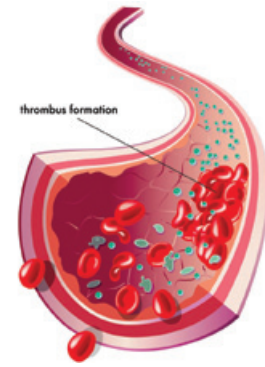
with improved echocardiogram, hemodynamic parameters, perfusion scans, and pulmonary angiograms.

Although this study has important findings, its limited sample size makes it too small to draw definitive conclusions; the meta-analysis also was determined to be underpowered.

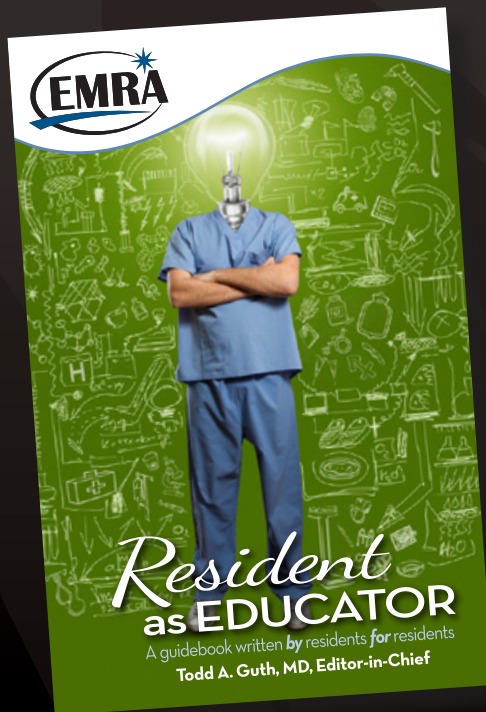
The Take Home

Thrombolytics should be considered in a patient suffering from a massive PE that is hemodynamically unstable; however, more data is necessary before definitive conclusions can be made.

Use these fundamental papers to help guide you in the middle of a tough shift when you're on the fence about where to take a patient's workup for a potential DVT or PE. Or at least you'll have them available to help you fake it 'til you make it! ★



“...a subject that seems to creep its way into nearly every differential diagnosis in the emergency department: deep vein thrombosis (DVT) and its most dreaded complication, pulmonary embolus (PE).”



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At a moment's notice, everything learned during those esoteric lectures, long nights on trauma, and rarely-performed procedures became essential.

TRAGEDY & TRIAGE

Two pressure cooker bombs exploded near the finish line of the Boston Marathon on April 15, 2013 - both devastating the city and strengthening its resolve. The blasts killed three and injured 264, a gruesome reality that emergency personnel were forced to confront in the harrowing seconds, days, and weeks following the attack. Following are two personal accounts of that day, as told through the eyes of emergency medicine physicians - one stationed at the race, the other at a receiving hospital.

The Emergency Medicine Community Unites in the Wake of the Boston Marathon Bombings



Adam Darnobid, MD
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Once again, our specialty saved lives. This time, Boston needed the unique skills of emergency medicine-trained physicians. Throughout residency training, opportunities to provide care outside the ED are plentiful. For years, residents and attendings from the UMass Department of Emergency Medicine have been joining physicians from a range of specialties at the Boston Marathon finish line medical tent. The entire event is such a positive experience; volunteers gladly return.

After the record heat and humidity of 2012, race organizers fiercely prepared for legions of ill and hyperthermic marathoners. Plans were in place to treat runners with every perturbation of sodium or temperature abnormality. The care of the runners on the course was augmented this year with physicians stationed along the route, all of whom had great working knowledge of resuscitation.

A NORMAL DAY

At the finish line medical tent, I had the chance to participate in a new program, *Bus Triage*. If runners became ill along the course, a bus would pick them up and deliver them to the resources at the finish line. From all around New England, hundreds of doctors, nurses, EMTs, trainers, and massage therapists were ready to provide medical care for runners who would come to the tent that day.

Inside the tent, we were set up with three separate areas: low acuity, “walk-in,” and ICU. We had a tremendous amount of resources set aside for the day. Occasionally a very sick runner would come off the bus; that person needed to be rapidly evaluated and triaged to the correct acuity in the tent. I worked next to Boston EMS and coordinated with them to make sure sick runners had an expedient exit from the area.

After a morning briefing, we set up the tent and met our respective teams. I had the great chance to work with a pharmacist, two logisticians, a registration person, and a sports medicine fellow. Together, we had a very complementary skill set.

The day started off beautifully. The weather was shaping up to be sunny, but a little chilly – a far cry from the heat of the previous year. Spirits were high; people were glad to be there. We all got to know each other better. Hundreds of strangers were becoming a team.

As the buses were coming to the finish line, I helped a handful of sick runners and brought them to the tent. As the day progressed, we were feeling good and hitting our stride.

THE AFTERMATH

In an instant everything changed. There was the sound of an explosion, then the smell of sulfur, then pressure and vibration. I knew something was wrong, but I didn’t know what. At the time, I was standing outside the tent, waiting for another bus to come to the finish

line. I immediately ran in and took whatever cover the canvas shelter could provide. I spotted my EMS colleagues putting on flack jackets and helmets.

Shortly after, the casualties started coming. The first two patients had lower extremity wounds that appeared to be caused by shrapnel. An amazing surge of activity began.

We had no information on the circumstances behind these injuries; all we knew was that there were a *lot* of them. The police were responding to a threat, but we had no idea what it was. The fire department was there, too. We heard talk about two explosive devices. *Was there a third? Were the buildings stable?*

Despite the unknown, medical volunteers clearly recognized their own mission – move casualties from the scene into the tent.

Moments after the first two injured patients arrived, I heard a new series of screams coming from the middle of the tent. A victim without legs was carried through. Muscle hung off the sides of the stretcher. In a moment, the tent

continued on page 10



A young girl places flowers at a memorial on Boylston St. after a citywide moment of silence.

PHOTOS COURTESY OF THE BOSTON HERALD

continued from page 9

had become a casualty area. The only thought in my head was: *He's got to get somewhere else.* After yelling at several people to ensure his rapid disposition, he was loaded into an ambulance and was on his way to definitive care.

In a blink of an eye, streams of wounded people walked, wheeled, and were carried in. Mangled limbs, profuse bleeding, and blast injuries appeared at an astonishing rate. As fast as one could be triaged out to an ambulance, three more victims already had arrived. Standing at what had become the exit of the tent, I had a bird's eye view of the chaos. I tried to decide which victims were most injured and rapidly became overwhelmed. In traditional triage terms, I had just received a huge number of "immediate" patients. Some clearly were sicker than others, and a few were getting worse in front of my eyes.

As ambulance stretchers became available I yelled to crews to take the next sickest person. But sometimes the choices were not obvious. Which was most critical – the gruesome near-amputation with bleeding controlled, or the intact extremity in a gray and shivering patient? Both patients were *sick* and I only had one ambulance.

As time went on, we moved as many patients as we could fit into an ambulance – two, three, and sometimes four. To transport as many victims as fast and as safely as possible, we tried mixing gravely injured patients with those whose injuries were less severe. As we ramped up our medical response, the patient flow wound down.

And just like that, they were gone. There were no patients left.

The medical teams were dismissed from the tent; the physicians were the last to leave. We were turned loose into the streets of Boston, not knowing what just happened and not knowing where to go. It was surreal. We walked through town just looking for something familiar.

We ended up at a restaurant and only then realized we had no way of getting out of town. The trains were stopped; the parking garages by the finish line

were roped off as part of the crime scene. After many phone calls, we found people willing to get us out of town. They'd take us to meet others who would transport us on the next leg west. Hours later, we were on our way, but the journey was only beginning.

.....

As the days went on, it only became harder. With sleepless nights and vivid visualizations, even simple tasks became

difficult. At unpredicted intervals, thoughts would come raging back. Feeling so helpless and overwhelmed was terrifying. I just wanted to be normal again, but my mind refused.

I transitioned from days of being hyperalert, to weeks of being in a fog. Day by day, the world has come back into focus – but things have changed, people have changed, and medicine has changed. ★

LESSONS LEARNED

WHAT YOU DO MATTERS



Mel Herbert's famous line resonates: "Emergency medicine made a difference that day." In the tent and in the EDs, emergency medicine training saved many lives. Its role went beyond ATLS and lectures; it required an understanding of the principles of emergent care; recognizing injuries; and acting in a resource-limited, chaotic, critical environment.

TRAINING COUNTS



Emergency medicine training is like none other. The unknown is *expected*. Illness and injury are the norm. Chaos is frequently a cost of doing business. To be conditioned to that and to function day to day in such an unusual environment can make a "job" seem odd. When something goes terribly wrong, those who can deal with those challenges step up from being providers to being *clinical leaders*. At a moment's notice, everything learned during those esoteric lectures, long nights on trauma, and rarely-performed procedures became essential. We needed to perform proficiently and quickly; in retrospect, so much became useful.

QUICK THINKING



Perhaps the single most amazing feat was achieving control over life-threatening hemorrhage. The number of extremity injuries – many of which were bleeding profusely – was astounding. The few commercially available tourniquets were quickly used up, replaced by belts, shirts, and IV and oxygen tubing. Many victims still are alive today because of the rapid identification and clever treatment of hemorrhage.

DISASTER TRAINING



Emergency medicine is the one specialty that prepares its physicians with specific training and know-how to operate in disaster situations. As a result, we're uniquely prepared to not only understand *response*, but also *preparedness* and *recovery*.

Having a surge of marathoners at any of the hospitals – even during *normal* race conditions – could have overwhelmed the local hospital system. Years of preparation, drills, and discussion resulted in a system that could adapt to this unknown surge and provide remarkable care. It's part of our legacy.

WORKING TOGETHER MATTERS



We had specialists from every area of medicine – from psychology to surgery. In an instant, we went from a hodgepodge group to a fully functional trauma system. Egos evaporated; teams worked with fluidity and grace. If one physician had limited knowledge, another physician would come to assist; our approach truly was patient-centered. Boston hospitals opened their doors, readied ORs, and held staff. Patients were distributed across a city and the city's hospitals were there, echoing the resilience seen at the finish line – ready for anything. You can do much more together than you can alone – and what you can do as a city is truly amazing.

FINDING HOPE AMIDST CHAOS



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Boston, MA

I can't remember their faces. After the radio call came through of a possible mass casualty, our attending clarified our immediate goal: *Clear out the ED.* A patient with a partial amputation had his thumb put on ice and was carted upstairs to plastic surgery. Previously drunk patients who had sobered up enough to walk and talk were discharged. Patients with abdominal pains who were awaiting CT scans or results were moved to the emergency department periphery to keep the trauma bays open.

The moments before the casualties arrived were perhaps the most surreal of the day: The ED was eerily quiet and empty.

The first patient arrived without legs. The next arrived with only one.

My role was to move from patient to patient and figure out what resources were needed. Every surgeon in our hospital seemed to be mulling about the ED, looking for ways to help all 24 of our patients. *Pulseless foot:* Grab a vascular surgeon. *Globe injury:* Find an ophthalmologist. *Compartment syndrome:* Bring in an anesthesiologist for a femoral block and an orthopedist to perform bedside fasciotomy.

Residents and attendings from services throughout the hospital arrived in droves, all asking me the same question: "What can I do?" – something I've never heard an attending ask *me*.

As I circled back to the patients who weren't immediately tubed, tourniqueted, and whisked to the OR, I reminded myself to fall back on my ABCs. Reassess. Don't take anything for granted.

Every patient had multiple abrasions with underlying edema that seemed out of proportion to the insult. After I saw the BB pellets that speckled the first chest x-ray, I realized that these "surface abrasions" represented penetrating trauma entry and exit wounds. It suddenly dawned on me that *any* abrasion could represent a projectile; reassessment of wounds became a priority.

Wounds I assumed were cuts actually were foreign bodies lodged near the carotid, or near the femoral artery, or in the belly. This realization led to a use of x-ray I'd never before considered – we essentially performed skeletal surveys complete with skull, neck, belly, and extremity films. *Where were the foreign bodies?* Only the films could tell.

No soft belly could be considered safe; the ultrasounds circled the department. Every patient needed a FAST. There were hundreds of suspect abrasions; any one of the patients could have a belly full of fluid.

A third bombing was announced over the radio; we were told to prepare for another wave of patients. This led to a collective sinking feeling.

As ED docs, we prepare for the worst and risk-reduce from there. In my mind, it was decided; these explosions would continue indefinitely. We would need to prepare for more than just a third wave – we would need to prepare for a *war*.

I had no perspective on what was happening outside our walls. I'd had no time to follow the news on TV or radio. All I knew was there were sick patients, and I was responsible for their safety. This is what we are trained to do; we handle the situation given to us, stabilize, initiate treatment, and get the patient the proper resources they need. We save lives doing this.

There was no third wave. There were no more bombs.

After the last patient was safely dispositioned, I asked my attending, Dr.

Leon Sanchez, what we should do next. He said, "What you always do – chart." I sat down next to an intern who had been there with me from the beginning and we documented what we had seen and done.

We revisited each of the patients in our minds from the objective standpoints of history and physical and medical decision-making. We made procedure notes and documented dispositions. As I wrote a note about a foot injury caused

"...in my mind it was decided, these explosions would continue indefinitely. We would need to prepare for more than just a third wave; we would need to prepare for a war."

by debris that went through the patient's shoe, I thought to myself: *I should've given pseudomonas coverage.* This logical thought – so devoid of emotion – continues to disturb me.

I looked around the department. There were dozens of emergency department docs wandering around, talking about what they had seen, asking what had just happened. Those who were late to the scene looked lost. Some were still showing up – amped up and ready to help – but it was all over.

Except it wasn't *really* over for me; I was still on my scheduled shift. As I was finishing my last note, I heard overhead, "Trigger to Room 5 for hypotension."

Back to work. Back to ABCs. Continue the mission.

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DISASTER MEDICINE

continued from page 11

The next days were hard. The hospital and our department set up debriefing sessions and meetings with social workers and psychologists. We organized a round table discussion, which I was fortunate enough to moderate. I found this to be extremely important. As an extrovert, finding the space to talk about an experience has never been a problem for me, no matter how many other people want to talk.

But everyone needed space, and it was important to create that space for every resident. Some spoke about their experiences at the finish line as first responders; some spoke about their experience in the department or on one of our off-site rotations; others described their survivor's guilt for being on vacation or at home sleeping after a night shift. The meeting gave perspective about what the day was like for each of us.

I spoke to my family members. I needed them to tell me what it was like to be at home during this disaster. They're New Yorkers, so we couldn't help but relate the experience of 9/11 to this tragedy in Boston. My sister told me about how it comforted her children when she told them, "Don't worry, Uncle Timmy was there to take care of the people that were hurt."



Emergency personnel work frantically on a victim in the aftermath of the explosions.

Thursday was the day of the memorial service. I just wanted to sleep. I just wanted to cry. I hadn't yet; I hadn't had time and hadn't figured out *how*. Directly before the service began, I was handed a note from a senior resident, Ken Marshall, which finally moved me to tears – in public, among the others who experienced what I had and were struggling with

its reality in their own ways (see box below).

We were on our feet clapping our hands as Mayor Thomas Menino (who had just left the hospital against medical advice to be at the service) wheeled himself up to the podium to rally us back to service. The faith leaders of our city – the city which adopted us all in that cathedral and called us their own – spoke with

Dear Tim,

When we talked earlier, I was trying to get you to consciously reflect and recognize all the ways that you helped the people that you treated on Monday. Some of the ways that you helped were massive and unequivocal, like recognizing the compartment syndrome: saving a person's leg through your diagnostic alertness and skills. Other ways you helped patients were by recruiting assistance for the problems you couldn't solve alone, and even simply by being kind to them when they needed kindness. Finally, in the midst of the crisis, you helped your coworkers in further ways still: by being a good person to work with and by being calm under pressure. Since that day, you have helped me and others by being emotionally honest, available, encouraging, and by continuing to earnestly work through the issues yourself. Moreover, whenever you give or accept love among your loved ones you continue to help the larger cause.

But what is the larger cause? Why does such a catalog of the ways in which you have helped others, the way they have helped you, and the ways that you have given and received

love, matter? To me, it has been helpful to reflect on these things because it is a reminder that love and decency always triumph. Even when evildoers cause pain and suffering – even in the face of bigotry, hatred, and injustice – humanity is able to overcome the devastation because of the skill, dedication, decency, and love of people like us. Each good and helpful act that we manage to do, however small, is another successful strike against evil, another crucial part in making the world a more perfect and whole place. We will persist in our work as physicians and as mere citizens with this confidence: we are taking part in overcoming evil in its many forms. Through both our professional dedication and our personal efforts to care for one another; to respect one another; and to follow our imperatives of duty, conscience, and integrity, we will continue to make the world more whole and more perfect when tragedy and misfortune strike our fellow men and women. In this struggle, we will always win.

Proud to be your friend,
Ken

eloquence and purpose. A Muslim man who had just become a citizen the week before spoke about the pledge he took to protect our constitution and our homeland; he said he never expected he would need to so soon.

MORE TO BE DONE

The next day was *Lockdown Day* and again I was working in our emergency department. I was tired and stressed. The hospital was on edge; the first suspect had been treated there the night before, but never made it out of the ED. About an hour after I showed up for my shift, I was told I would not be allowed to leave.

Again? How long would this last? How long would I be working in the department?

The only patients arriving to the ED were those who were too sick to be transported to community hospitals outside of Boston. Strokes, STEMIs, GCS-less-than-8 type patients. The day was playing with my emotions.

All of a sudden, the chief of emergency medicine called out, "Prepare the trauma room – he may be coming." We knew "he" was the second suspect. I went to the head of the bed and prepared to intubate; I set up the chest tube tray. "We're gonna keep this guy alive," I said. The chief soon announced, "Stand down." It was a false alarm, but I was on edge – *What would be next? When would we catch him?*

That afternoon I was tired, I was edgy, I was short with people I'm not usually short with. The suspect was still out there, but I had to go home.

That night, I watched the news for the first time in days. I sat with my girlfriend and recounted the week's events. I received a call from my assistant program director. She asked if I'd like to take the next day off. I badly needed time away from work, but I felt guilty. I was the newly elected chief resident; *I couldn't rest.*

But I hadn't slept in days and I was fading. Still, I told her, "I can't – I need to be a role model." She responded, "So be a role model and take a day off." My classmates stepped up and worked the shift with no questions asked. They supported me.

I had trouble sleeping that night, as I realized that I needed to prepare for that week's morbidity and mortality conference. It would be my first. At Beth Israel Deaconess, the chiefs prepare M&Ms and present the cases. I would do it with one of the current chiefs who would tutor me on how to do the job. We poured through the 24 charts, trying to see which three cases would best represent the day and provide the most education on how to manage blast injuries, amputations, and globe ruptures.

Sleeping became a problem. How would we present what we had seen, while respecting the victims and being sensitive to the feelings of those who were there that day; how could we prevent re-traumatizing them? How

could we keep the sensitive information in line with HIPAA?

Would the FBI even let us do this? Would the legal department at our hospital? We had to disinvite the paramedics who usually come to our Wednesday morning M&Ms and limited the session to hospital employees. We checked IDs at the door. I had to destroy every email I sent immediately after I sent it; I had to be careful.

The morbidity and mortality discussion went well; it was respectful. We presented three bombing victim cases and the two suspects. After it was done, I went home and finally slept. I woke up the next day and went back to work. ABCs. ★



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“...this finite time in our careers – filled with hope, discovery and sometimes, tears – ultimately must yield to another chapter in our lives; room must be made for the next generation of emergency physicians.”



Ije Akunyili, MD, MPA
EMRA Vice Speaker of the Council
University of Texas Health Science Center
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FLIGHT LESSONS

NAVIGATING THE POST-RESIDENCY SKIES

June is here and the time has come for emergency medicine residents to move on to new beginnings. This phase in the academic calendar is when senior residents, including myself, say goodbye to their residency roles and embark on careers in academia or community emergency medicine. I have always believed our speciality's residents are the bulwarks of the nation's health care system. Yet, this finite time in our careers – filled with hope, discovery and sometimes, tears – ultimately must yield to another chapter in our lives; room must be made for the next generation of emergency physicians. As your EMRA vice speaker, I would like to take the liberty of telling you three things I know for sure – lessons I hope will help you prepare for your flight.

1 ASK A QUESTION THAT BREAKS THE CONSPIRACY OF SILENCE

Ask questions that go beyond your patients' chief complaints; explore the underpinnings of their humanity. I vividly remember a teenager who presented with two worried parents in tow during one of my busiest shifts. His chief complaint was "headache," but he had a distinctly sad glint in his eyes that haunted me throughout the entire encounter. We went through an extensive headache differential and even a negative CT.

As with all adolescents, I decided to have a conversation with him alone. After the routine questions about drug use, sexuality and safety at home yielded no strong anchors, I finally asked, "Are you sad?" Yes he was; in fact, he was planning to commit suicide. He had prepared a noose hanging from a backyard tree just before his parents found him crying; he had told them he had a headache. After hundreds of intubations and resuscitations, I had saved a life merely by asking a question that gave this one patient permission to find his troubled voice.

Asking the difficult questions breaks the conspiracy of silence and holds us present and accountable to our patients. Indeed, we are forced to go beyond the quotidian and consider deeper questions of mental health, homelessness, health care disparities, treatment of women, human trafficking – desperate human issues that we lose if we do not ask deeper questions.

2 ADVOCATE

What is a physician advocate? It is a physician that, beyond his or her regular clinical duties, champions policy issues that affect our specialty, medicine, and society. Whether you choose to run for political office (like emergency medicine physician and Congressman Raul Ruiz, whom I will interview for *EM Resident* in my next update); join your state ACEP chapter; or remain active as EMRA alumni – we *all* are called to be advocates for emergency medicine. To be crusaders for change, we must remain fundamentally steeped in our knowledge base about politics and health care policy. Attending the Leadership and Advocacy Conference in Washington D.C. is an excellent way to jump-start the process of becoming a physician-advocate.

3 ACTIVELY READ SCIENTIFIC LITERATURE

Remain curious, voracious readers of the scientific body of literature that guides our specialty. With an insane schedule that often includes school visits for my kids after night shifts, I often question what motivates me to create time for journal articles, reviews and textbooks. It is the understanding that we have the ability to save lives and change our practices based on the goal of lifelong learning. It is a privilege to translate scientific discourse to bedside knowledge and go beyond basic regurgitation to revealing the basis of our interventions to our patients.

"The sole goal of all our education must be the recognition that we are the last bastions between our patients and death. Very few human beings hold this honor."

I urge you to keep reading, learning, listening to podcasts, and attending lectures – especially after graduation. The goal of our education must include some recognition that we are the last bastions between our patients and death.

One last thing: There is a narrative to all of our lives. Sometimes, this narrative is written in biographies and autobiographies; but for most of us, it remains embedded in the memories of our patients, their families and our loved ones. Set your sights on how you want your final story to be told, and live each day as if you were actively writing your final life script.

Class of 2013, your future is bright beyond belief. Remember to *ask*, *advocate* and *actively read*. Let us fly off into the horizon of our future careers, knowing that our journey together has just begun. Don't forget to keep your EMRA alumni membership, read the new, bold, beautiful *EM Resident* magazine and remain ambassadors of our profession.

I am still here working for all of you and listening to your feedback. Godspeed. ★

A View from

THE FRONT LINE

Brief History of Emergency Medical Services in the U.S.



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EMS began to see its role change on the front lines of health care; its practice no longer focused solely on adult trauma and cardiac emergencies. Chronic diseases, pediatric patients, and the underserved all began to play major roles in defining when EMS should be dispatched.



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Pre-hospital emergency care in the modern age is often described as a “hierarchy” of human and physical resources utilized in the acute setting to provide the best possible patient care until definitive care can be established. Like most hierarchies, the system we have in place today was forged one link at a time, dating as far back as the Civil War. With widespread trauma, a systematic and organized method of field care and transport of the injured was born out of necessity.

It wasn't until 1865, however, that the first civilian ambulance was put into service in Cincinnati. Four years later, this was followed by a civilian *ambulance surgeon* in New York.¹ The New York

service differed slightly from the modern approach, as the team arrived equipped with a quart of emergency brandy for each patient.

Once again, military conflicts and necessity provided much of the impetus to develop innovations in the transportation and treatment of the injured. In the wake of World War I, the *Roaring Twenties* saw the first volunteer rescue squads forming in locations such as Virginia and New Jersey. Control began to shift towards municipal hospitals and fire departments; funeral home hearses were slowly joined by fire units, rescue squads and private ambulances in the transportation of the ill and injured.

By 1975, there were 32 emergency medicine residencies across the nation, which prepared physicians to interface with EMS at all levels – from responders and educators, all the way to medical directors.

The North East Volunteer Fire Company, North East, MD, has responded to an automobile accident circa 1969. A police officer is being prepared by the volunteers for transport; the crew is being aided by Maryland State Troopers.

PHOTOS COURTESY OF THE HISTORICAL SOCIETY OF CECIL COUNTY





Circa 1964 (above) and in more recent years (left), Singerly EMS personnel prepare to transport a patient in Elkton, MD.

Landmark articles in the late 50s and early 60s began to detail the science and methods for initial CPR, forging yet another vital link in the chain as EMS began its first steps into the treatment of pre-hospital cardiac patients. Departments trained in cardiac resuscitation began to reveal successes in major urban areas such as Columbus, Los Angeles, Seattle, and Miami.

The 1960s provided another challenge to public health as traffic accidents began to lead to considerable trauma and death. This new trend was detailed in the **infamous 1966 white paper titled “Accidental Death and Disability: The Neglected Disease of Modern Society.”**² The paper, prepared by the National Academy of Sciences and the President’s Commission on Highway Safety, detailed the injury epidemic and the lack of appropriate pre-hospital care or an organized system to treat patients suffering from critical traumatic injuries. Reforms were indicated in the education and training, systems design, staffing, and response of the nation’s ambulance services.

This publication and its recommendations for a standardized emergency response gave way to the **National Highway Safety Act of 1966**, which established the Department of Transportation (DOT). The DOT and its daughter organization, the National Highway Traffic Safety Administration (NHTSA), were critical in pushing for the development of EMS systems. They encouraged standardized education and curricula protocols. They recommended involvement at the state level and helped oversee the creation of regional pre-hospital emergency systems and regional trauma center systems.

This led to the birth of trauma center accreditation by the American College of Surgeons Committee on Trauma. For the first time in U.S. history, a curriculum standard was set, which mandated the skills and qualifications required to become an emergency medical technician. Paramedic education arrived shortly afterwards; it still has a ways to go in terms of scope and depth, however.

The **EMS Systems Act of 1973** provided funding for the creation of more than 300 EMS systems across the nation. It also set aside funding for key future planning and growth. It was during this time, when EMS was getting a stable foothold, that emergency medicine began to establish itself as a specialty, and the first residency training program was established in 1970 at the University of Cincinnati.³ By 1975 there were 32 emergency medicine residencies across the nation, which prepared physicians to interface with EMS at all levels – from responders and educators, all the way to medical directors.

Advances in care standards and education continued throughout the 1980s, including changes in the principles of funding for EMS with the **Omnibus Budget Reconciliation Act**. The act established EMS funding from state preventative health block grants, rather than funding from the EMS Systems Act.

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EMERGENCY MEDICAL SERVICES (EMS)

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EMS also began to see its role change on the front lines of health care; the sole focus was no longer on adult trauma and cardiac emergency alone. Chronic diseases, pediatric patients, and the underserved all began to play major roles in defining when EMS should be dispatched.

Recognizing the need for a cohesive approach between EMS and the remaining health care world, the 1996 **EMS Agenda for the Future** detailed how EMS can integrate into other medical fields, as well as advance its own practice. **EMS Education Agenda for the Future** was published shortly thereafter, describing modern recommendations for core curricula content, scope of practice, and certification of EMS professionals.⁴



Vintage ambulance from Waynesboro, PA

Within the last 10 years, EMS has become a focus of intense research into many commonly encountered acute care issues seen in emergency medicine. With increasingly integrated technology between pre-hospital care and the ED, patient data is beginning to be transmitted in real time – allowing for earlier determination of patient severity and care management prior to arrival.



EMS providers start CPR on a truck driver involved in a fatal accident in 1979.



Basic life support providers are working the scene of automobile accident circa 1976.

Quality improvement with integrated electronic charting (including patient outcomes) is beginning to provide much-needed feedback to allow EMS to grow as a dedicated subspecialty of emergency medicine. Within regional stroke centers, cardiac catheterization centers, and trauma systems, EMS has moved to the forefront of emergency medical care and can only serve to advance how emergency medicine is conducted in the future.

EMS has come a long way from its infancy in the days of the horse and buggy. As it grows alongside emergency medicine, there are opportunities for physicians to become involved at every level. While EMTs are not independent

practitioners and are required to operate under a medical director's scope and license, the situations they face require considerable problem-solving, judgment, and clinical decision-making skills.

Physicians are needed at every step to help develop treatment protocols, provide quality improvement, hold regular training sessions, and ensure all personnel have the tools they need to perform high-quality pre-hospital care. Physicians also may be called upon in situations that require their presence in the field, including mass casualty incidents, high-risk scenarios, tactical situations, or patients that require advanced procedural skills. Large-scale operations like concerts, conventions, and city events also benefit from physician input.

EMS will continue to be the front line of emergency medicine as the field continues to expand. Physicians involved with pre-hospital care will be paramount in providing the support and knowledge required to help EMS systems grow, as evidenced by the recent recognition of EMS as an official clinical subspecialty. ★

Involvement in the new EMRA EMS Division is a great opportunity for EMRA members with a career interest in EMS, as well as those seeking exposure on working with pre-hospital systems in the future.

SIGN OUT IN THE EMERGENCY DEPARTMENT

Seamless Transition *or* Opportunity for Disaster

Think back to sign out on your most recent Friday night shift. It is an experience all of us have had – an overflowing waiting room, patients in every bed, chair, and closet available. We also have experienced varying levels of quality sign outs ranging from a 20-minute junior medical student presentation to a simple, “chest pain, troponin negative, awaits stress test.”

Although we are all aware of the dangers of sign out, few of us have been formally taught how to efficiently and effectively communicate patient information. In recognition of this gap in training, the ACGME has placed a new emphasis on training resident physicians in the art of patient handoff. Specifically, programs and institutions are now expected to have a “documented process in place for ensuring the effectiveness of transitions.”

Will this new emphasis on transition of care be another “hoop” to jump through in residency, or is it an essential component of patient safety in the ED? To answer this question, we first need to address the specific challenges in the emergency department, assess our goals in sign out, and then review potential strategies for achieving these goals.

Prior to the ACGME’s attention to transitions in patient care, other medical organizations had already recognized the importance of accurate and efficient physician transition of care in the ED. The value of this process had been recognized by both the Institute of Medicine and the Joint Commission, which instituted a *National Patient Safety Goal* in 2006 for hospitals to “implement a standardized approach to handoff communications, including an opportunity to ask and respond to questions.”

Unfortunately, as noted by the Institute of Medicine in “To Err is Human:

Building a Safer Health System,” EDs are exceptionally susceptible to “high error rates with serious consequences.” Of note, communication errors are deemed to be the root cause of 70% of sentinel events, and 84% of treatment delays are related to break downs in communication. Multiple unique challenges exist in our EDs, where numerous patient handoffs occur every day.

Our first challenge is posed by the disruptive environment in which we practice. This includes interruptions from staff, active patient management, and EMS call to just name a few. We also are faced with implementing a *concise yet complete* sign-out process. Since every moment we have in the ED is valuable, we struggle to find the balance between thorough and efficient communication of patient information.

Unfortunately, effective physician-to-physician handoff practices have been inadequately studied. Due to lack of supporting evidence and research, few, if any, standards are established for patient handoff in the ED. Even after an adequate sign out, the true transition of care can be ambiguous, as the outgoing team may remain to finish documentation and other tasks. We also rely on the cognitive interpretation of the outgoing team. If an incorrect assessment is transmitted, the erroneous information usually will be perpetuated as “diagnosis momentum.” Transition of care in the ED has been addressed in several articles including, “Improving Handoffs in the Emergency Department,” published in the *Annals of Emergency Medicine* in 2009.

In order to plan a sign out process that will protect both our patients and our colleagues, we need to address the following objectives:

- Transmission of significant data or events
- Awareness of what data is important for monitoring changes in patient course



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- Preparing the oncoming team to deal with effects of previous events
- Communicating anticipation of future events
- Ensuring understanding of the current plan of care strategy

In order to meet these objectives, we can integrate several strategies into our sign out practices. First, **try to reduce the number of patient handoffs** as much as possible. Shift overlap or a “buffer time” may reduce treatment delays and miscommunication. Next, we should **limit distractions and background noise** as much as possible. Choosing a quiet and dedicated space will increase the efficiency of sign out. Third, a **standardized approach to sign out delivery can be undertaken** to ensure all important details, including chief complaint, assessment and plan, and disposition are communicated. Fourth, **clearly communicate outstanding tasks, anticipated changes in patient course, and your overall care and disposition plan**. The most difficult and frustrating sign outs occur when the assessment and disposition plan are unclear. Fifth, **have all patient information ready for review** in order to encourage questions and discussion of your assessment.

Protecting patient (and resident) safety during sign out in the ED will always be a challenge in our unique environment; however, the ACGME’s emphasis on transitions of care offers an opportunity to review and improve our current practice. By developing an awareness of the challenges and strategies to address them, we can transition towards a safer, more effective patient handoff process. ★

NEUTROPENIC FEVER IN CANCER PATIENTS

An Emergency Medicine Perspective

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“Those with hematologic cancers or undergoing bone marrow transplantation are at much higher risk for developing neutropenic fever.”

A 59-year-old man presented to the emergency department with altered mental status and abdominal pain. His past medical history was significant for B-cell lymphoma; he had last undergone chemotherapy two weeks prior. He had a heart rate of 170, a blood pressure of 70/40, a respiratory rate of 20 and a temperature of 39 C.

His exam was remarkable for abdominal tenderness, most prominently in the right lower quadrant. He also had a region of erythema and warmth on his right thigh. He did not have any indwelling catheters or ports. Initial labs revealed an absolute neutrophil count (ANC) of 230, an INR of 2.3, and creatinine of 1.3. Blood cultures were drawn, vancomycin and cefipime were started along with aggressive fluid resuscitation. Abdominal imaging was obtained, which revealed thickening of his large bowel, most prominently in the cecum. Norepinephrine was later added. The patient was admitted to the MICU for further management.

Neutropenic fever (NF) in cancer patients is an uncommon presentation in the emergency department. It is defined as a temperature greater than 38 C (100.4 F) for one hour or a single temperature greater than 38.3 C (100.9 F), in addition to an ANC less than 500 cells/mm or a predicted drop to less than 500 cells/mm in the next 48 hours. Some experts use

the term *profound neutropenia*, which refers to an ANC count below 100 cells/mm; it generally is associated with more severe disease and worse outcomes.

The vast majority of patients will present to the ED within six weeks of administration of chemotherapeutics; the ANC typically is lowest 12 to 14 days following chemotherapy. Fever occurs frequently in patients undergoing chemotherapy; of these, obvious infections occur in 20% to 30%, with occult bacteremia present in an additional 20% to 30%. Due to the blunting of the inflammatory response, fever may be the only evidence present of an active infection.

Other causes of fever include the underlying malignancy, transfusion of blood products, thromboembolic disease, and the chemotherapeutic agents administered. Those with hematologic cancers or undergoing bone marrow transplantation are at much higher risk for developing neutropenic fever, with rates of 70% to 90%. It is thought that these higher rates occur as a result of increased myelosuppression and intestinal epithelial damage. Patients with solid tumors have much lower rates of febrile neutropenia. The number of chemotherapeutic cycles and the dose intensity selected by the oncologist also are correlated with the frequency of neutropenic fever.

Chemotherapeutic agents cause a breakdown in the integrity of mucosal surfaces that allow for the translocation of endogenous flora. The most common locations where infections occur are the respiratory tract, the gastrointestinal tract, and the skin. Patients with indwelling catheters are also at much higher risk of infection in these regions; in addition to the two standard sets of peripheral blood cultures, cultures should be drawn from these catheters, as skin flora enter the body through the catheter sites. Indications for catheter removal include tunnel infections, pocket infections in ports, a clotted port, persistent bacteremia despite therapy, atypical mycobacterial infection and candidemia; the decision to remove a catheter should always be done in conjunction with appropriate consultants.

Pneumonia is very common in NF; however, due to profound neutropenia, the presence of infiltrates on plain films commonly lags behind abnormal breath sounds and tachypnea. A single-center study demonstrated that chest x-rays found only 60% of pneumonias that were identified by chest CT. The signs and symptoms of intra-abdominal infection also are typically vague; any evidence of tenderness should merit a CT scan.

Special attention to right lower-quadrant tenderness is important; these patients frequently have

neutropenic enterocolitis (typhlitis), an inflammatory, hemorrhagic, and necrotic process of the lower GI tract – most commonly in the cecum. Rectal exams and temperatures can increase bacterial seeding and typically are discouraged in neutropenic patients. Although fungal infections often occur after admission, it is important to thoroughly evaluate the oral mucosa for thrush and the nasopharynx for any signs of fungal infection.

It is important to identify patients who are likely to develop major complications. High-risk patients include those with severe neutropenia (ANC<100), an expected length of time with neutropenia ≥7 days, higher intensity chemotherapy, and evidence of systemic illness; they require aggressive IV antibiotics. The Multinational Association for Supportive Care in Cancer scoring system was published in 2000 and was designed to identify patients at low risk for complications of febrile neutropenia (Figure 1). This

model incorporated 756 patients at 20 different centers and is accepted as an effective tool for identifying patients who are unlikely to have significant sequelae of neutropenic fever. The maximum score is 26; patients with a score ≥ 21 are considered low risk, have a mortality under 1%, and a serious medical complication rate of 6%.

Laboratory analyses should be quickly performed, but treatment should not be delayed for results. The Infectious Disease Societies of America recommends collecting at least two sets of cultures prior to antibiotic administration. If there is a central venous catheter or peripherally inserted central catheter present, a set of cultures also should be drawn from each lumen. A CMP also is recommended to evaluate for an increase in serum creatinine, BUN, and any liver function abnormalities that would qualify a patient as high risk. A chest x-ray should be acquired for patients with evidence of respiratory

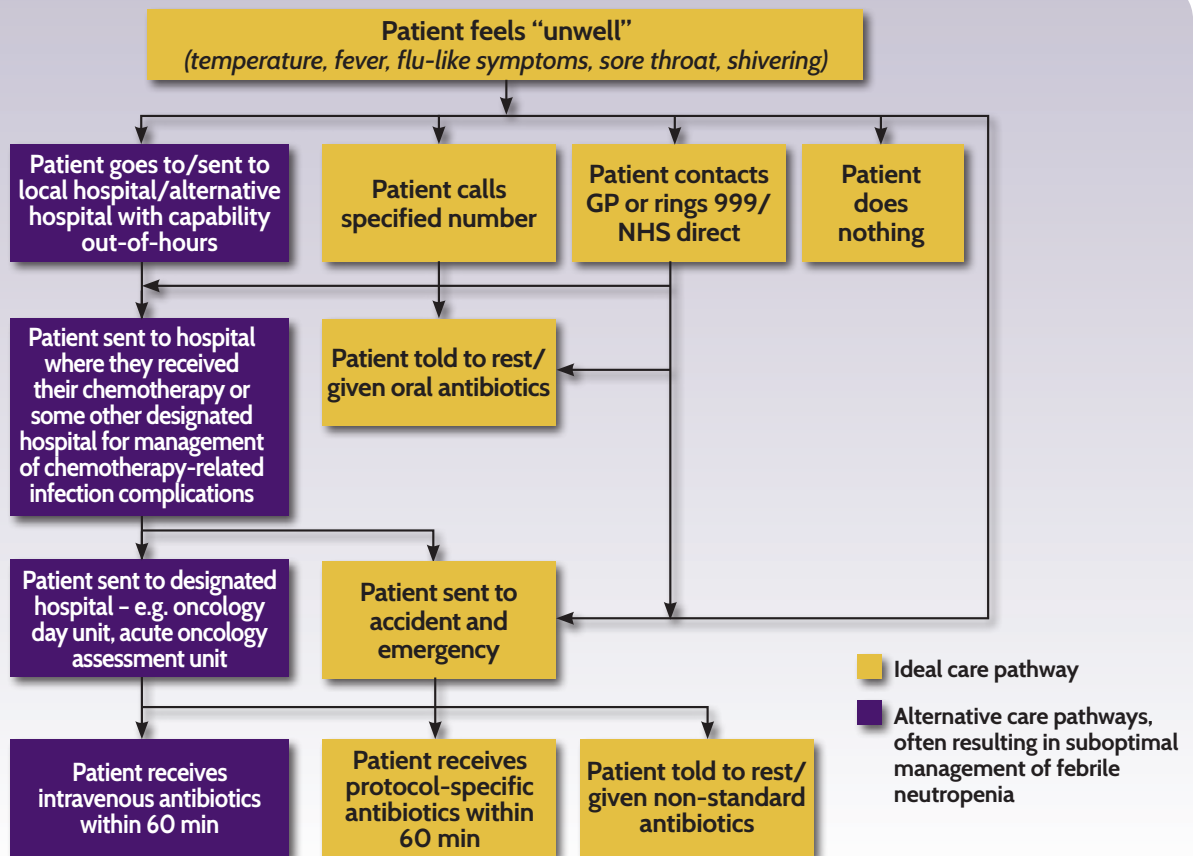
dysfunction, including cough, hypoxia, and tachypnea. Urine and CSF may demonstrate an absence of white cells, even if there is an infection present.

When chemotherapeutic agents were introduced in the 1960s and 1970s, gram-negative flora were the most common causes of neutropenic fever. With the increased use of indwelling catheters, gram-positive bacteria now constitute more than 70% of infections. Common isolated gram-positive bacteria include *coagulase-negative Staph*, *S. aureus*, *S. viridans*, *Enterococci*, *S. pneumoniae*, and *S. pyogenes*. Gram-negative bacteria tend to cause more serious infections, higher fevers and include enterobacteriae such as *E. coli*, *Klebsiella*, and *Enterobacter*.

Pseudomonas also remains a clinically important and devastating organism in this population. In recent years, increasing numbers of extended-spectrum beta-lactamase and

continued on page 22

Gold standard care pathway for patients with febrile neutropenia.



Adapted from the British Journal of Cancer, 2009, Cameron D.

continued from page 21

carbapenemase-producing gram-negative bacteria have been documented. Gram-positive bacteria also are increasingly resistant, with MRSA rates around 20% at some centers and vancomycin-resistant enterococcus rates greater than 50%.

Fungal infections may not be apparent until after admission. The most common fungal pathogen is *Candida spp*, which typically presents after a week of antibacterial therapy. It may be noticed first as thrush or other mucosal site infection and then enter the blood stream, generally presenting as persistent fever despite therapy. Invasive molds, including *Aspergillus*, *zygomycosis*, and *fusariosis*, are typically found two weeks after therapy and are often identified in the sinuses and lungs.

Early empiric administration of antibiotics is the standard of care for neutropenic fever. Experts recommend the administration of antibiotics within 30 minutes of triage for higher risk patients, and within one hour for lower risk patients. Patients should be evaluated for their levels of risk by examining their co-morbidities; treatment regimens; any significant abnormalities, including hypotension, altered mental status, hypoxia, and decrease in urine output; or focal signs of infection, including cough, abdominal pain, or rash. Attention also should be paid to patients' allergies, recent antibiotic use, recent cultures, and local/institutional antibiotic-resistance biograms.

For patients deemed high risk, the initial therapy of choice is a bacteriocidal antipseudomonal beta-lactam agent. Available antibiotic choices include fourth-generation cephalosporins (i.e., cefepime), extended spectrum beta-lactams (i.e., piperacillin-tazobactam), or a carbapenem (i.e., meropenem). Monotherapy with an antipseudomonal beta-lactam agent has been shown to be just as effective as combination therapy. Furthermore, adding an aminoglycoside as a second agent increases the risk of nephrotoxicity, among other side effects.

FIGURE 1 MASSC SCORE FOR DETERMINATION OF RISK FOR SERIOUS COMPLICATION FROM NF

CHARACTERISTICS	SCORE
Burden of illness:	
Mild or no symptoms	5
Moderate symptoms	3
Severe symptoms	0
No hypotension (SBP >90 mm Hg)	5
No chronic pulmonary disease	4
Solid tumor/lymphoma with no prior fungal infection	4
No dehydration	3
Outpatient status (at onset of fever)	3
Age <60 years	2

Combination therapy has not been demonstrated to prevent the emergence of antibiotic resistance. The addition of an aminoglycoside may be indicated in patients with severe sepsis, septic shock, or infection with a resistant gram-negative organism. Current guidelines do not support adding vancomycin unless it is clinically indicated for catheter-related infections, skin and soft tissue infections, known MRSA infections, or hemodynamic instability. For the patient in septic shock with neutropenic fever, a more aggressive regimen is recommended; and an aminoglycoside also should be added.

Patients with life-threatening, immediate hypersensitive reactions to penicillin should avoid beta-lactam agents. Aztreonam has little cross-reactivity with penicillin and is an acceptable choice for these patients. Vancomycin should be added to patients taking aztreonam for coverage of gram-positive organisms. In patients with non life-threatening penicillin allergies, cefepime may be used. Empirically starting antifungal agents in the emergency department is *not* recommended. If a patient is persistently febrile for four to seven days, the primary team is likely to add antifungal agents; they may be added earlier if there is a known prior fungal infection or clinical evidence of such.

Low-risk patients who are hemodynamically stable without

leukemia, evidence of organ failure, pneumonia or severe soft tissue infection, and who are well-appearing may be switched over to oral agents while in the emergency department. Acceptable regimens for these patients include combination therapies of ciprofloxacin and amoxicillin-clavulante, levofloxacin or ciprofloxacin monotherapy, or ciprofloxacin plus clindamycin. Patients transitioned to oral agents who are to be managed in the ambulatory setting need close daily follow up and should be instructed to return to the hospital within one hour of any acute changes in their illness. If weighing the possibility of outpatient treatment, the decision should be made in conjunction with the patient and his or her primary oncologist.

In this particular case, our patient's MASSC score was 11 (0 for severe symptoms, 4 for no prior pulmonary disease, 4 for lymphoma without prior fungal infection, 3 for outpatient status at onset of fever). A CT scan of his abdomen revealed typhlitis. He remained febrile and his blood cultures grew *E. coli*; at day four, micafungin was added for persistent fever. Unfortunately, he continued to deteriorate and required orotracheal intubation shortly afterwards. A family discussion was held and comfort care was initiated on day six. ★

Special thanks to Dr. Vaishal Tolia for helpful comments and insights.

EVERYTHING I NEED TO KNOW I LEARNED IN MEDICAL SCHOOL



Graham Ingalsbe, MD
EMRA MSGC Chair (2012-2013)
University of Miami
Miller School of Medicine
Miami, FL

With fourth-year students transitioning to internships, fresh new batches of medical students are taking their first steps into the profession. At the risk of getting misty-eyed and nostalgic, I realize how many things I've learned when I reflect on the last four years. In the end, however, the most important lessons I learned in medical school are the most basic: *show up, be nice, and simply care.*

Show Up

Woody Allen really did have it right when he said, "80% of success is showing up." In medical school we are provided with opportunities to make as much or as little out of an experience as we desire. Early on, we are given the option to either attend a lecture or just review it at our own pace the next day. On clinical rotations it may be easier to be a wallflower and cut out early than to get in on time and stay through the course of a day; but it is in those moments when we are *truly present* that real learning occurs. If you show up and are engaged, you will

have more learning opportunities, more hands-on time, and a richer experience. The things you witness will impact your clinical decisions and help shape the kind of doctor you will be.

Be Nice

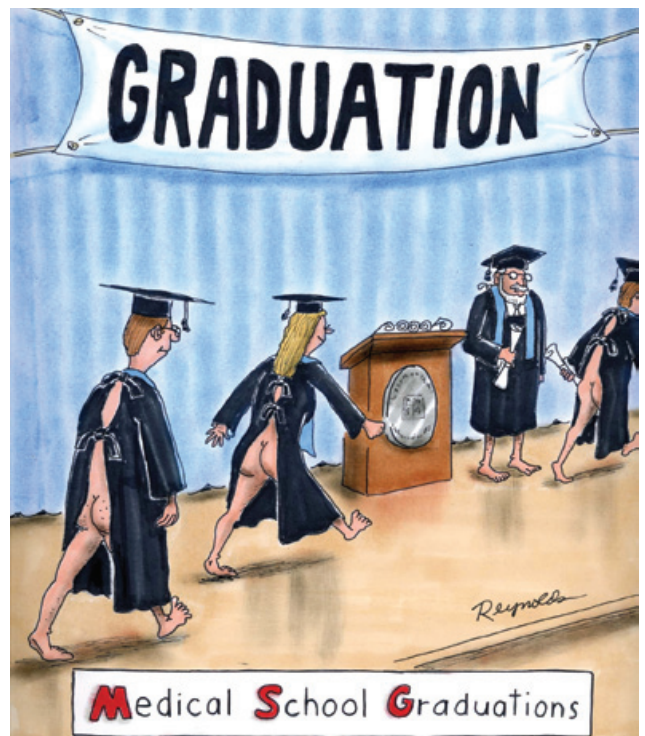
Seems simple. As much as it might feel like kindergarten-age advice, the medical field is full of difficult and challenging patients, problems, and personalities that require "a spoon full of sugar." The preclinical years are much more enjoyable when you work *with* your classmates rather than *against* them. Lending a hand and being a positive influence on your colleagues makes for a better learning environment. When consulting another service or being consulted, be respectful, positive, and give the benefit of the doubt to those you encounter. This goes for patients and their families, as well as the clinical team. Treating nurses, techs, and assistants with respect will make you a better – and much happier – clinician.

Care

Just showing up doesn't cover it. It's easy to ride passively through a clinic or shift. It might seem more fun to check your phone and make plans for the weekend; however, by putting forth an effort to care about every patient you encounter, you will enrich your clinical life immeasurably. More importantly, if you can remain nice to your friends and family despite long hours, rough days, and a lack of sleep, your home life will be better for it.

In my time as EMRA's student chair, I've grown (and watched the organization grow) by observing the leadership show up, be nice, and care. There's a lot more to medicine than these three simple rules, but these are the ones that make the road smoother and more enjoyable. To quote Conan O'Brien, "If you work really hard and you're kind, amazing things will happen." ★

"The most important lessons I learned from medical school are the most basic: *show up, be nice, and simply care.*"



DEADLINE ALERT

Star Search

Call for 2013 EMRA Fall Award Nominations

- Augustine D’Orta Award
- EDDA Scholarship
- Global Health Initiative Award
- Excellence in Teaching Award
- Joseph F. Waeckerle Founder’s Award
- Clinical Excellence Award
- Local Action Grant
- EMRA Mentorship Award
- Leadership Excellence Award
- EMRA Travel Scholarship to Scientific Assembly

Let your hard work shine and be rewarded for your dedication to emergency medicine! It’s time to nominate yourself – or a colleague – for a coveted EMRA Award! Please visit emra.org for application information; the deadline for submissions is July 15. Awards will be presented at the **EMRA Awards Reception** during ACEP’s 2013 *Scientific Assembly* in Seattle, October 16, 2013.



UPCOMING EVENTS

- June 15-19** Annual Meeting of the AMA House of Delegates
Deadline
- July 10** Annals of Emergency Medicine Resident Editorial Board Fellowship Application
Deadline
- July 15** EMRA/ACEP Travel Scholarships to ACEP13 *Scientific Assembly*
Deadline
- July 15** EMRA Fall Awards
Deadline
- August 8-13** ACEP Teaching Fellowship
Dallas, TX
- August 31** EMRA Fall Representative Council Resolutions
Deadline
- Sept 15** EMRA Board of Directors Candidate Application
Deadline
- Oct 11-17** ACEP13 *Scientific Assembly*
Seattle, WA

Call for Applications

2013-2014 EMRA-ACEP HEALTH POLICY DC MINI-FELLOWSHIP

The EMRA/ACEP mini-fellowship provides a four-week experience centered out of ACEP’s Washington, DC office.

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DEADLINE ALERT

Applications are due **July 15, 2013**
For more details and to apply online visit www.emra.org

EMRA/SAEM^{ME} SimWars



Stanford University

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



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CONGRATULATIONS TO OUR DESERVING WINNERS!

Clockwise from left > **Residency Coordinator of the Year:** Chris Adelsberg, Allegheny General Hospital; **Assistant Residency Director of the Year:** Anand Swaminathan, MD, FACEP, New York University/Bellevue; **Residency Director of the Year:** Herbert Eugene Hern, MD, FACEP, Alameda County Medical Center; **Dedication Award:** Michael Ritchie, MD, SUNY Downstate/Kings County; **Local Action Grant:** Brad Martin, Mayo Medical School; **Dr. Alexandra Greene Medical Student Award:** Joe Reardon, Harvard Medical School; **EMBRs Scholarship:** Shannon Toohey, MD, University of California, Irvine; **Jean Hollister EMS Award:** Doug Dixon, MD, Indiana University School of Medicine; **Academic Excellence Award:** Laura Medford-Davis, MD, Baylor College of Medicine.

EMRA Quiz SHOW



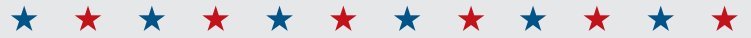
Congratulations to the tough, brainy residents who publicly tested their EM knowledge and their mettle at the **EMRA Quiz Show** at *SAEM's Annual Meeting* in Atlanta. Twelve superstar teams from across the country showed off their mastery of medical trivia, and **Denver Health** (pictured above) brought home the title of champion!



Kudos to our EMRA Quiz Show contestants: Boston University, Carolinas Medical Center, Cook County Hospital, Denver Health Center, Emory University, Georgetown – Washington Hospital Center, Maimonides Medical Center, Oregon Health Services University, Regions Hospital, St. Luke's – Roosevelt Hospital Center, and Staten Island University, plus our great impromptu team of attending physicians! Special thanks to the EMRA Education Committee and our stellar event MCs, Dr. Annie Arens and Dr. Brandon Allen.

DEADLINE ALERT
EMRA Leadership Opportunities

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Three-year term. The first year will be served as President-Elect; the second year will be served as President, the primary spokesperson for EMRA; and the third and final year is spent as Immediate Past-President/Treasurer.

VICE SPEAKER OF THE REPRESENTATIVE COUNCIL

Two-year term; first year serving as Vice Speaker, and second as Speaker. Assists Speaker as Parliamentarian for the Representative Council, acts as director of all Representative Council task forces, and is the EMRA Delegate to the AMA Resident and Fellows Section at the annual and interim AMA meetings.

TECHNOLOGY COORDINATOR

Two-year term. Responsibilities include: editing, procuring, reviewing, and approving content for the EMRA website; advising the board on matters of technology; and ensuring that the membership's technology needs are being adequately addressed.

ACADEMIC AFFAIRS REPRESENTATIVE

Two-year term. Responsibilities include: representing EMRA to the ACEP Academic Affairs Committee, acting as EMRA liaison to the Council of Residency Directors (CORD), and serving as EMRA board liaison to the Medical Student Governing Council.

EM RESIDENT EDITOR/SECRETARY

Two-year term. Responsibilities include: Editing *EM Resident* and taking full responsibility for content, production and publication of EMRA's bi-monthly magazine. Recording minutes at various meetings.

**EMRA elections will be held during
ACEP13 Scientific Assembly
in Seattle on October 15**

For full position descriptions and detailed application instructions, please visit
www.emra.org.

If you are interested in running for a position, please email your CV, a statement of interest (200 words or less), letter of support from your residency director, and a photo (JPG format) to mpackardmilam@emra.org by September 10. EMRA will post statements and photos received from candidates on the EMRA Website. Nominations from the council floor will also be accepted.

THE NEW NAME GAME

The ambiguity of the title “doctor” and what it means to the future of physicians.



Sarah Hoper, MD, JD
EMRA Legislative Advisor
Washington University in St. Louis

Nurse practitioners (NPs) are a vital part of the American health care system. They can be found in every medical arena – from family practice clinics, to the OR, to the ICU and in the emergency department. In my home state of Iowa – and 22 other states – NPs practice independently without the supervision of a physician.¹ Rural and underserved areas are *dependent* on nurse practitioners. With the recent advent of the Affordable Care Act (ACA), NPs have been lobbying hard to increase their independence.²

The American Association of Colleges of Nursing recommends that by 2015 all entry-level NP educational programs transition away from offering the *Master of Science in Nursing* degree in favor of the *Doctor of Nursing Practice* degree. Nursing currently provides two doctorate-level degrees: The **Doctor of Nursing Practice (DNP)**, and the **Doctor of Philosophy (PhD)**. The PhD in nursing is generally considered the academic and research-oriented degree, whereas the DNP is the practice-oriented option.³ Nurses argue that NP courses now take three to four years to complete and go beyond the level of training required for a master’s degree.

Jan Towers, NP-C, CRNP, FAANP, PhD
– the director of health policy for the

American Academy of Nurse Practitioners (AANP) – said the DNP “creates a better playing field for nurse practitioners to be doctors, just like physicians, pharmacists, podiatrists, and optometrists.”⁴

A 2008 survey revealed, however, that Americans are confused about the credentials and qualifications of many health care providers. Sixty-seven percent of those polled believed podiatrists are MDs; 77% believed dentists are MDs. More than 90% of those surveyed favored all health care providers – clearly designating their skills, training, and level of education.

These findings prompted the American Medical Association to launch its “Truth in Advertising Campaign” in 2011, stating, “Patients deserve to know who is providing their care.”⁵ It may be even more difficult for patients to discern who is providing their health care when they come to a clinic, hospital, or emergency department that employees both MDs and DNPs – both professionals are calling themselves “doctor.”

As of 2013, only seven states – Arkansas, Connecticut, Georgia, Maine, Mississippi, Oklahoma, and Oregon – specifically prohibit DNPs from using the title “Doctor” with their patients. Four more states – New York, Pennsylvania, South

Dakota, and Virginia – require DNPs to clarify that they are not physicians.⁶ Ninety-one percent of those polled believed the title “physician” should refer only to medical doctors.

Although DNPs have an extended education beyond nursing school, there is clearly a difference in the training of an MD and DNP. A physician typically will amass four years of undergraduate education, four years of medical school, and three to eight years of residency training. Physicians often pursue additional years of fellowship training. A typical DNP will have four years of undergraduate education, experience as a registered nurse, and three to four years of advanced practice education.⁷

With the expansion of ACA, DNPs are not just looking to fill in the holes in underserved areas as primary care providers; they are also looking to get into emergency medicine. EmCare recently featured an article, “An E.D. Doctor Who’s Not an M.D.,” on its clinician blog.⁸ The article promotes the use of DNPs in the emergency department.

According to Dr. Eley, one of the featured physicians, “No longer can the advanced practice nurse remain in the

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Ninety-one percent of those polled believed the title “physician” should refer only to medical doctors.



LEGISLATIVE ADVISOR REPORT

continued from page 29

mid-level role. Nurse practitioners' skills and knowledge place them in a role of top performers and the attainment of the Doctor of Nursing Practice degree reflects those qualifications."

It is also important to remember that the average NP makes about \$90k/year and **the average emergency physician makes \$260k/year**,⁹ a fact that makes hiring DNPs very attractive.

As the role between DNP and MD becomes increasingly blurred, it is important for emergency physicians to let the public and legislators know they are irreplaceable. ACEP has been, and continues to be, one of the top health professional lobbying groups in Washington, D.C., but we're not the only health professionals that recognize the value of lobbying. Over the last seven years, the American Nursing Association has steadily increased its lobbying spending; the American Association of Nurse Anesthetists has outspent the American Society of Anesthesiologists on lobbying. This may be one reason why the 2008 survey showed that only 76% of those polled thought anesthesiologists were medical doctors.

The public is confused not only about the roles and credentials of MDs and DNPs, but also the education and qualifications of *all* health professionals. Perhaps the easiest way to alert the public to our qualifications is by changing our introduction to, "Hello, I am Dr. Smith. I am the *physician* who will be taking care of you today." ★



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BACKYARD POLITICS

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Jerry B. Bodily, MD
NM ACEP Secretary
University of New Mexico
Albuquerque, NM

While most significant health care legislation occurs at the federal level, major battles can occur even in our own backyards.

Each year, state legislatures debate bills that will impact the future of emergency medicine, including those related to tort reform, restriction on emergency department visits, and scope of practice changes. You may be wondering how busy emergency physicians keep up with these myriad legislative proposals, but help is available! Your state ACEP chapter monitors pending legislation and can even introduce legislation protecting the interests of emergency providers.

The state of Washington proposed legislation in 2011 that would deny reimbursement for ED visits by Medicaid beneficiaries if a patient's ED diagnosis was considered "non-emergent" by the state.¹ These supposedly **low-acuity complaints included a number of non-specific ED diagnoses, including "chest pain," "abdominal pain," "shortness of breath," and "asthma exacerbation."**³ Shockingly, the state attempted to base reimbursement decisions on a patient's *final* ED diagnoses, rather than on their presenting symptoms. This was in clear violation of the "prudent layperson" standard established by a 1994 revision to the Emergency Medical Treatment & Labor Act (EMTALA) of 1986.

From the Code of Federal Regulations (42 CFR 422.113)

Emergency and urgently needed services – Definitions. *Emergency medical condition* means a medical condition manifested by acute symptoms of sufficient severity (including severe pain) that a prudent layperson, who possesses an average knowledge of health and medicine, could reasonably expect the absence of immediate medical attention to result in the following:

- A. *Placing the health of the individual (or, with respect to a pregnant woman, the health of the woman or her unborn child) in serious jeopardy.*
- B. *Serious impairment to bodily functions.*
- C. *Serious dysfunction of any bodily organ or part.*²

In other words, the prudent layperson standard states that the **average person should not be expected to self-diagnose**. Federal regulations define an emergency by the episode's presenting symptoms, not the final diagnosis made by a trained medical provider. Washington State proposed to do just the opposite.

Fortunately, a coordinated effort involving ACEP leadership at both state and national levels helped to defeat this proposed legislation. Washington State ACEP board member, Dr. Nathan Schlicher, who led the college's effort to defeat the bill, went on to win a seat in the state's Senate.

This successful advocacy campaign in Washington also has spurred changes in other states. California ACEP proposed a bill that extended the prudent layperson standard to its state's Medicaid program;⁴ Governor Jerry Brown signed the bill into law in 2012.

In my home state of New Mexico, existing legislation mirrors the federal prudent layperson standard. Consequently, legislation like that proposed in Washington

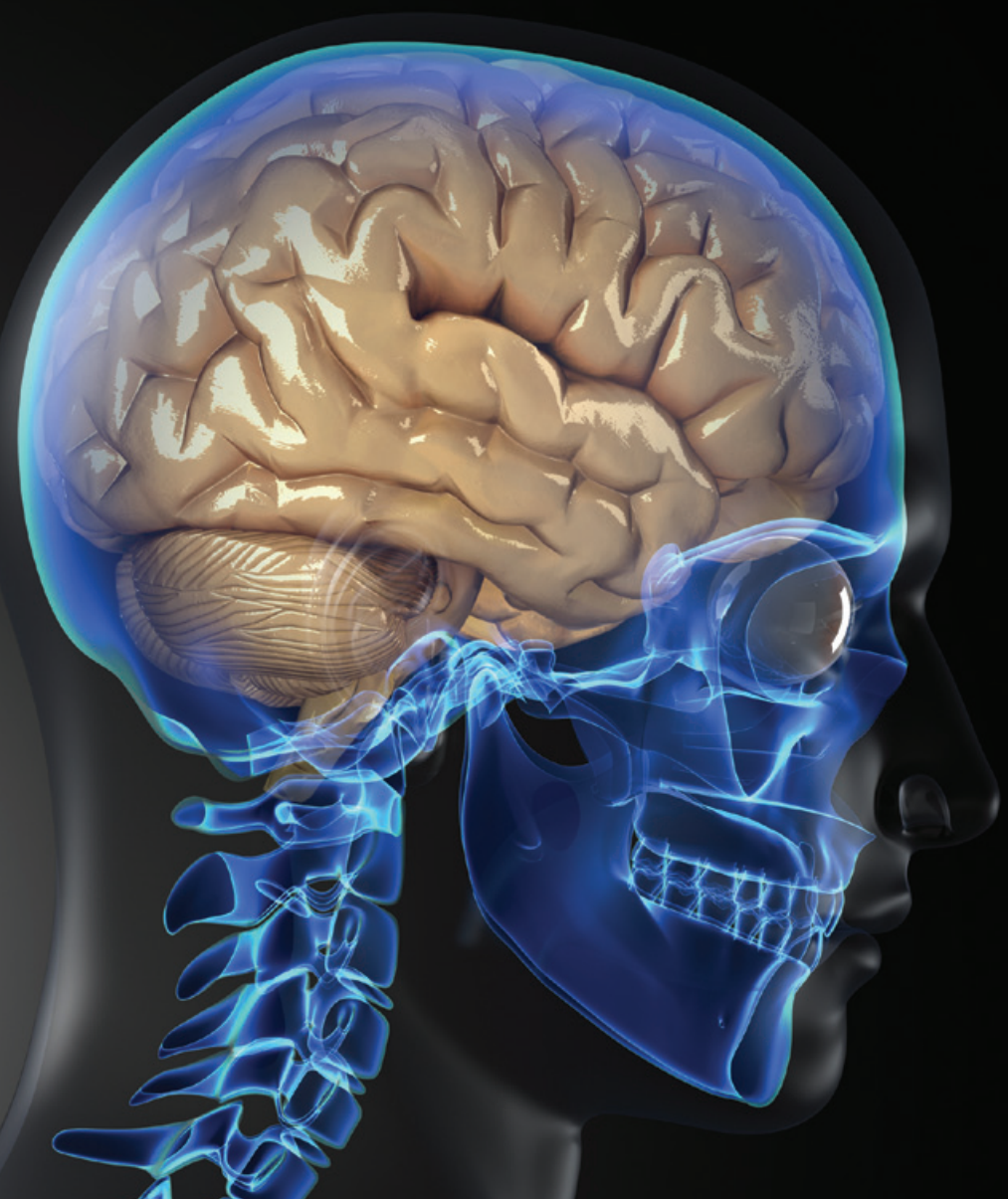
has not been an issue. During its most recent legislative session, however, New Mexico ACEP (NM-ACEP) responded to multiple proposed bills that would have negatively impacted emergency medicine practitioners. These included proposed increases to malpractice limits and changes to the scope of practice for chiropractors.

NM-ACEP is also working with the state Board of Nursing to develop legislation permitting ED nurses to administer medications for procedural sedation, a practice currently prohibited by state law. Pushing medications is not a major issue for those of us who work at large academic centers, since there are usually plenty of residents who can step into this role. The current state law in New Mexico, however, presents a significant challenge for single-coverage providers in the community. Although this health policy initiative succeeded in getting new rules passed by the state Board of Nursing, the process stalled in the state legislature due to opposition from the anesthesia and nurse anesthetist communities. Despite this legislative failure, significant gains were made in highlighting this issue.

Successful advocacy requires coordination between individual emergency medicine physicians, the medical community, and members of the state legislature. As emergency medicine residents and future practitioners, the best way to **affect health policy change at the state level is through our state ACEP chapters**. Remember, issues are being discussed just miles from your doorstep that will eventually affect the care of your patients. Getting involved in the debate now will allow you to *formulate* your state's health policies – not just *respond* to them.

For updates on active policy issues, visit emra.org > resources > advocacy. We also welcome your thoughts and opinions on [Facebook.com/EMRA.Health.Policy](https://www.facebook.com/EMRA.Health.Policy). ★

The decision to initiate fibrinolytic therapy is incredibly fast, and providers will have to weigh a “swift versus sure” approach to managing a patient with an acute neurologic deficit.

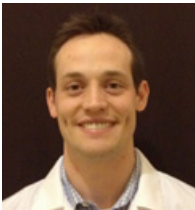


STROKE SIGNALS

Thrombolytics in Acute Ischemic Stroke

WHEN TO USE THEM

and what to do when things go wrong



John Greenwood, MD
Chair, EMRA Critical Care
Committee
University of Maryland
Medical Center
Baltimore, MD

CASE

A 52-year-old female with a history of hypertension and hyperlipidemia presents from home two hours after experiencing acute right-sided weakness. The patient's daughter witnessed the onset of symptoms and noted that the patient's speech was incoherent. She has had no recent trauma or surgeries; she takes both daily aspirin and lisinopril. She works as a fourth grade art teacher at the local elementary school.

The patient is afebrile, has a heart rate of 110, blood pressure 172/104, respiratory rate of 18, SpO₂ of 99% on room air, and a finger-stick glucose of 82. You calculate a NIH Stroke Scale Score of 22, then rush her over to the CT scanner for a rapid head CT (Table 1).

Upon returning to the resuscitation room, you find the stroke team waiting for you. They ask, "Does the patient have any contraindications to tPA?"

Both the emergency physicians and neurologists have a conversation with the daughter about the risks and benefits of thrombolytic treatment; the decision is made to administer tissue plasminogen activator (tPA) for presumed acute ischemic stroke. As you walk back to your station to complete your notes, you ask yourself, "Did I make the right decision?"

A few minutes later, out of the corner of your eye you notice a small commotion coming from the patient's room. A concerned nurse runs to you and says,

"The use of fibrinolytic therapy for acute ischemic stroke is rapidly becoming an expected treatment for those who meet eligibility criteria in the emergency department."

"Doctor, we need you back in the resuscitation room. The patient who was just given tPA is vomiting all over herself!" *Now what?*

Case Discussion

In March of 2013 the American Heart Association (AHA) and American Stroke Association (ASA) released an update to their 2009 guidelines for the early management of the patient with an acute ischemic stroke (AIS).¹ The 2013 guidelines provide an expansive review, making recommendations based on a number of clinical trials including **NINDS**, **ECASS**, **ATLANTIS**, and **IST**, to name a few.²⁻⁵ The release of this scientific statement has rekindled the debate about the utility of tissue plasminogen activator in patients presenting to the emergency department with an acute stroke.

In the face of the recent controversy, both ACEP and AAEM have developed clinical policy statements discussing its use and consideration.^{6,7} As a result, it's important for ED providers to know indications and contraindications to the use of tPA – inside and out.

The emergency physician's job does not end with successfully making the 60-minute door-to-needle time, however. It also is important to understand the risks associated with the use of tPA and be able to address them rapidly. Complications of the drug include intracranial hemorrhage, angioedema, and anaphylaxis. While these complications generally are rare, there are details in the history and

evaluation that can clue the physician in to those patients who have an increased risk of complications.

IV Fibrinolytic Therapy for Acute Ischemic Stroke

The use of tPA in patients presenting with an AIS has become a widely accepted practice.¹ Any patient with a suspected stroke and a measurable neurologic deficit presenting within three hours of onset should be considered for fibrinolytic therapy. **Specific inclusion and exclusion criteria are listed in Table 1.** Patients presenting between 3 and 4.5 hours of symptom onset should also be considered for IV tPA treatment, with **additional inclusion and exclusion criteria listed in Table 2.**

The dose of IV tPA is a total dose of 0.9 mg/kg with a maximum of 90 mg (within 3 hours: Class I, Level of Evidence A; between 3-4.5 hours: Class I, Level of Evidence B). The dosing regimen begins with a 10% bolus given over 1 minute followed by an infusion of the remaining 90% given over 60 minutes.¹

There are a number of new recommendations in the 2013 guidelines related to the timing and consideration of tPA use in the ED. It is now recommended that the door-to-needle time should be within 60 minutes from hospital arrival (Class I, Level of Evidence A). Consequently, the decision to initiate fibrinolytic therapy is incredibly fast, and providers will have to weigh a "swift versus sure" approach to managing a patient with an acute neurologic deficit.

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The guidelines recommend considering the use of IV fibrinolysis in patients with mild stroke deficits, rapidly improving stroke symptoms, major surgery in the preceding three months, and recent myocardial infarction. The provider must consider the potential increased risk of harm, which should be weighed against the anticipated benefits.

This new recommendation presents a challenge to the clinician because it's often difficult to determine whether an acute deficit is from a *true* stroke or just a stroke *mimic*. Common mimics include seizure with a residual Todd's paralysis, complicated migraine, psychogenic causes, and certain metabolic disorders. The incidence of stroke mimics is unknown, but they are estimated to occur in between 3-21% of patients treated with tPA.⁸⁻⁹ While this may seem high, there is no evidence that these patients have

an increased risk of complications after treatment.⁸⁻¹⁰

There are a few circumstances when the provider should consider *not* giving IV thrombolytics in AIS:

- **First**, if there is a new or frank hypodensity on the initial non-contrast head CT, consider withholding tPA. Specifically, if the hypodensity involves more than one-third of the MCA territory, thrombolytics should be withheld; they are at a high risk for hemorrhagic conversion.¹
- **Second**, patients may receive tPA therapy while on most oral anticoagulants if they present within the three-hour window *unless* they are taking the newer direct thrombin inhibitors or direct factor Xa inhibitors (dabigatran, rivaroxaban). The use of tPA in patients taking these newer anticoagulants may be dangerous

and should not be given unless the patient's aPTT, INR, platelet count, escarin clotting time (ECT), thrombin time (TT), or appropriate direct factor Xa activity assays are normal. If a patient has not taken a dose of these medications in more than two days, treatment may be considered if they have normal renal metabolic function.

Complications of tPA Treatment Symptomatic Intracranial Hemorrhage (sICH)

One of the most feared complications of the treatment of AIS with tPA is symptomatic intracranial hemorrhage. The estimated incidence of post-tPA sICH is approximately 6.3- 8.6%; it occurs most often within 36 hours of tPA administration.^{2,11}

A number of risk factors have been suggested, including age, high NIH Stroke Scale Score (NIHSS), radiographic

TABLE 1. INCLUSION AND EXCLUSION CRITERIA FOR tPA WITHIN THE THREE-HOUR TREATMENT WINDOW

INCLUSION CRITERIA	RELATIVE EXCLUSION CRITERIA
<ul style="list-style-type: none"> • Diagnosis of ischemic stroke causing measurable neurological deficit • Onset of symptoms <3 hours before beginning treatment • Aged ≥18 years 	<p>Recent experience suggests that under some circumstances – with careful consideration and weighting of risk to benefit – patients may receive fibrinolytic therapy despite one or more relative contraindications. Consider risk to benefit of IV rtPA administration carefully if any of these relative contraindications are present:</p> <ul style="list-style-type: none"> • Only minor or rapidly improving stroke symptoms (clearing spontaneously) • Pregnancy • Seizure at onset with postictal residual neurological impairments • Major surgery or serious trauma within previous 14 days • Recent gastrointestinal or urinary tract hemorrhage within previous 21 days • Recent acute myocardial infarction within previous 3 months <p>The checklist includes some FDA-approved indications and contraindications for administration of IV rtPA for acute ischemic stroke. Recent guideline revisions have modified the original FDA-approved indications. A physician with expertise in acute stroke care may modify this list.</p> <p>Onset time is defined as either the witnessed onset of symptoms or the time last known normal if symptom onset was not witnessed.</p> <p>In patients without recent use of oral anticoagulants or heparin, treatment with IV rtPA can be initiated before availability of coagulation test results, but should be discontinued if INR is >1.7 or PT is abnormally elevated by local laboratory standards.</p> <p>In patients without history of thrombocytopenia, treatment with IV rtPA can be initiated before availability of platelet count, but should be discontinued if platelet count is <100,000.</p> <p><i>aPTT</i> – activated partial thromboplastin time; <i>ECT</i> – escarin clotting time; <i>PT</i> – partial thromboplastin time; <i>rtPA</i>, recombinant tissue plasminogen activator; <i>TT</i> – thrombin time</p>
<p>EXCLUSION CRITERIA</p> <ul style="list-style-type: none"> • Significant head trauma or prior stroke in previous 3 months • Symptoms suggest subarachnoid hemorrhage • Arterial puncture at noncompressible site in previous 7 days • History of previous intracranial hemorrhage • Intracranial neoplasm, arteriovenous malformation, or aneurysm • Recent intracranial or intraspinal surgery • Elevated blood pressure (systolic >185 or diastolic >110) • Active internal bleeding • Acute bleeding diathesis, including but not limited to: <ul style="list-style-type: none"> • Platelet count <100,000 • Heparin received within 48 hours, resulting in abnormally elevated aPTT > upper limit of normal • Current use of anticoagulant with INR >1.7 or PT >15 seconds • Current use of direct thrombin inhibitors or direct factor Xa inhibitors with elevated sensitive laboratory tests (i.e., aPTT, INR, platelet count, and ECT; TT; or factor Xa activity assays) • Blood glucose concentration <50 mg/dL (2.7 mmol/L) • CT demonstrates multilobar infarction (hypodensity >1/3 cerebral hemisphere) 	

Modified from the 2013 AHA/ASA Guidelines for the Early Management of Patients with Acute Ischemic Stroke¹

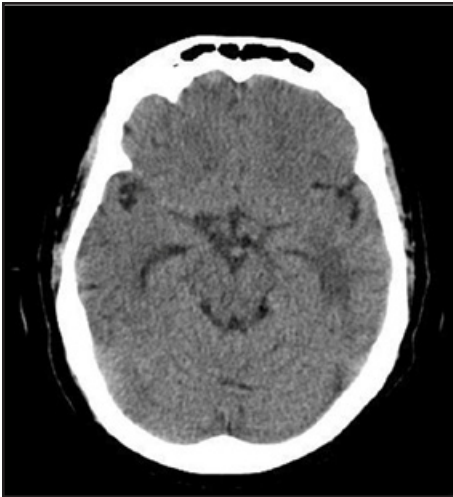


FIGURE 1. Head CT with left sided hypodensity and early ischemic changes
PHOTO COURTESY OF MICHAEL ABRAHAM, MD

evidence of stroke on CT, and other comorbidities. Patients with evidence of cerebral edema or a hypodensity on their non-contrast head CT have been found to have up to a 50% increased risk of sICH. In fact, a secondary analysis of the ECASS II trial found that the extent of hypodense changes found on CT was an independent risk factor for sICH.¹² Patients with a high NIHSS (> 20) also have a high risk of hemorrhage.¹³ Despite these findings, experts still suggest that patients with these specific risk factors should be considered for tPA treatment; the treatment may offer functional benefits that can be obtained without a change in mortality.^{1,13}

After administering tPA, it is important to monitor for signs of intracranial hemorrhage. Signs can be subtle, but include: acute neurologic decline, decrease in level of consciousness, sudden headache, nausea/vomiting, or a sudden increase in blood pressure. If an intracerebral hemorrhage is suspected, immediately stop the tPA infusion and obtain a rapid non-contrast head CT.

Unfortunately, there are no evidence-based guidelines for the reversal of thrombolytics. General recommendations include platelet transfusion and the administration of cryoprecipitate (0.1 units/kg) to restore depleted fibrinogen levels.¹⁴ Aminocaproic acid and fresh frozen plasma also should be considered.

“...the emergency physician’s job does not end with successfully making the 60-minute door-to-needle time.”

For severe cases, recombinant factor VIIa or tranexamic acid may be used.¹⁵

Angioedema

Acute oropharyngeal angioedema is estimated to occur in approximately 1-5% of patients who receive tPA for AIS.¹⁶⁻¹⁸ A history of ACE-inhibitor use should always be obtained, as it is estimated that concomitant ACE-inhibitor use may increase risk of angioedema from a baseline risk of 1% up to 5%.

Increased oropharyngeal swelling most often will occur within the first hour of treatment, so it is imperative for the ED physician to be aware of this danger and be prepared to perform rapid-sequence intubation or fiberoptic intubation if necessary. Consider ordering blood products, tPA reversal agents, and a surgical consultation early if a definitive airway is unable to be established.

Treatment of tPA-associated angioedema is similar to standard medical treatments of *non*-tPA angioedema, including H1 blockers, H2 blockers, and

corticosteroids. In advanced cases, or if there is a suspected anaphylactoid reaction, prompt administration of epinephrine (0.3 mg IM) should be given. In addition to these medications, the tPA infusion should be stopped immediately.

The Bottom Line

The use of fibrinolytic therapy for acute ischemic stroke is rapidly becoming an expected treatment for those who meet eligibility criteria in the emergency department. It’s imperative for ED physicians to be readily aware of the indications, contraindications, and potential complications of tissue plasminogen activator.

While it is quite possible that tPA is an excellent drug for the treatment of an acute ischemic stroke, *it’s unclear which group of patients benefit most.* For now, it’s the job of the emergency physician to treat those who can benefit from tPA, while also recognizing those at high risk for complications and managing them when they occur. ★

TABLE 2. ADDITIONAL INCLUSION AND EXCLUSION CRITERIA FOR tPA WITHIN 3 TO 4.5 HOURS FROM SYMPTOM ONSET

INCLUSION CRITERIA

- Diagnosis of ischemic stroke causing measurable neurological deficit
- Onset of symptoms within 3 to 4.5 hours before beginning treatment

RELATIVE EXCLUSION CRITERIA

- Aged >80 years
- Severe stroke (NIHSS >25)
- Taking an oral anticoagulant, regardless of INR
- History of both diabetes and prior ischemic stroke
- NIHSS – National Institutes of Health Stroke Scale; rTPA – recombinant tissue plasminogen activator

Modified from the 2013 AHA/ASA Guidelines for the Early Management of Patients with Acute Ischemic Stroke¹

SILENT KILLER

Carbon monoxide poisoning in the pediatric patient

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CLINICAL SCENARIO

A seven-year-old girl presents to the emergency department after a possible seizure. According to her mother, the girl's arms stiffened and she became blue in the face. She appeared to stop breathing.

Her family rushed her to a local hospital in Mexico, where she was noted to be altered, but improving. Her vital signs are normal and her exam is unremarkable. The mother mentions that the entire family has been complaining of headache, nausea, and light-headedness. She "felt funny" herself when she woke up this morning and even noticed their dog whimpering and crying.

The clinical scenario on the left suggests carbon monoxide poisoning, given the multiple affected family members and the constellation of symptoms including headache, nausea, vomiting, and altered mentation. Carbon monoxide (CO) is a colorless, odorless gas released from the burning of carbonaceous materials such as vehicle exhaust, house fires, and heaters.^{1,2} Cases like this one typically occur during winter months when space heaters and generators are used.

After inhalation, CO has a high affinity for hemoglobin (about 250 times higher than oxygen). Once bound to hemoglobin, this complex creates carboxyhemoglobin (COHb), which can cause serious harm even in small amounts.³ The amount of COHb formed is directly related to the concentration of CO at the time of exposure and the length of time exposed. COHb causes a shift in the oxygen-hemoglobin dissociation curve to the left and leads to hypoxemia and a relative anemia. Poisoning occurs at the cytochrome oxidase enzyme in the mitochondria and the platelet heme protein, causing direct neuronal and cardiac injury.^{4,5}

CO poisoning presents with vague flu-like symptoms, as well as headaches, nausea, vomiting, syncope, changes in mental status, weakness, or confusion. Inquiring if other members in the household or environment have had similar symptoms may lead to the correct diagnosis. Children often exhibit symptoms at lower COHb levels than adults; pets may show signs of

poisoning, as well. Upon traditional physical examination, patients with CO poisoning present with a "cherry red" appearance, although this is more often a

post-mortem finding. Nonspecific physical exam findings are the norm and include mild fever, tachycardia, tachypnea, and hypertension or hypotension. Diagnosis frequently is made

Pulse oximetry alone is unreliable in the diagnosis of carbon monoxide poisoning.



CO poisoning presents with vague flu-like symptoms, as well as headaches, nausea, vomiting, syncope, changes in mental status, weakness, or confusion.

from good clinical and social histories and high clinical suspicion, followed by confirmatory blood tests.

Pulse oximetry alone is unreliable in the diagnosis of carbon monoxide poisoning. A co-oximeter – a blood gas analyzer that measures

Pediatric patients may manifest symptoms differently, however, depending on age or location to the CO source.⁷ Levels >20% manifest as nausea, headache, and confusion or disorientation. Severe neurologic deficits, cardiac injury, and even coma can occur at >40%.¹ These symptoms often will correlate with laboratory findings such as lactic acidosis, increased troponin, or increased creatinine kinase. EKGs routinely should be obtained in all children suspected of CO poisoning. EKG findings vary depending on the degree of toxicity, ranging from normal to an ischemic injury pattern; the most common finding, however, is sinus tachycardia. If obtained, CT or MRI of the brain may reveal lesions in the globus pallidus.⁶

Once the diagnosis has been made, hyperoxygenation therapy with 100% oxygen should be initiated without delay, followed by consultation with poison control. Patients with more serious features require admission for observation, ICU level of care, or hyperbaric oxygen (HBO) therapy. In HBO, patients breathe 100% oxygen in a dive chamber pressurized to two to three atmospheres. Hyperbaric oxygen increases the partial pressure of oxygen and shifts the oxygen dissociation curve back to the right.

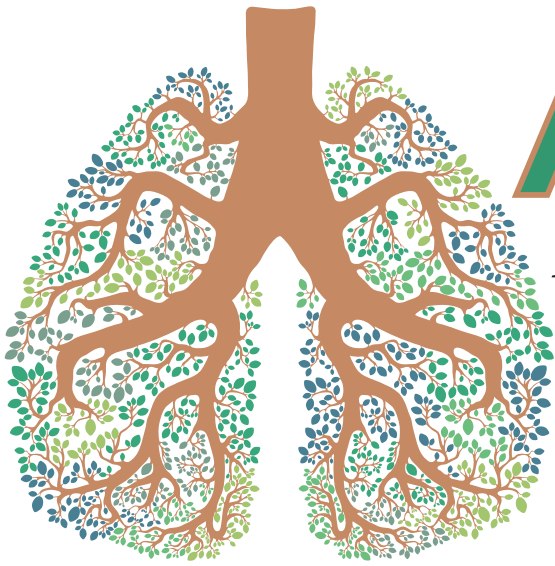
Standard accepted guidelines for referral for HBO therapy include syncope, confusion/altered mental status, seizure, coma, focal neurologic deficit, pregnancy with carboxyhemoglobin level >15%, blood level >25%, or evidence of acute myocardial ischemia.⁷ The treatment remains controversial regarding who benefits, however, and who should be referred to a facility with HBO capabilities. HBO therapy in pediatric patients should be discussed on a case-by-case basis with pediatric intensivists, toxicologists, and HBO specialists.

Children who have milder symptoms, such as vomiting, headache, or increased COHb, can be observed in the ED on high-flow oxygen. In adults, the half-life of CO is 320 minutes on room air, 80 minutes on 100% normobaric oxygen, and 23 minutes on 100% hyperbaric oxygen. This can be used to estimate the time of oxygen therapy needed for the pediatric patient. If all other labs are normal and symptoms have resolved after four hours of observation, most patients can be safely discharged home. Be sure to consult with the local poison control center prior to discharge. These children should have close outpatient follow up, as pediatric patients are at risk for neurocognitive delay. Parents should have their child screened as an outpatient following an exposure. ★

CASE FOLLOW-UP

After all family members had been interviewed, the family was collectively diagnosed with CO poisoning. The source of the exposure was found to be a gas stove that was lit for warmth. The patient's room was closest in proximity to the heater. After 90 minutes, the patient's CO level was 16.5%. High-flow oxygen via a non-rebreather mask was started and she was transferred to a tertiary pediatric center. Repeat testing upon arrival to the tertiary center three hours away revealed a CO level of 1.7%. She had a normal EKG and cardiac enzymes, no focal deficits with serial exams, and was asymptomatic throughout the remainder of her observation. She was discharged home with instructions to follow up with her PCP for neurocognitive testing.

oxygenated hemoglobin, COHb, deoxygenated hemoglobin, and methemoglobin levels – should be used instead. There is little difference in the arterial or venous carboxyhemoglobin level, so venous blood gas is often used for confirmatory testing.⁶ COHb levels of 20-40% are considered toxic levels, with symptoms beginning at levels >15%.¹



AIR SUPPLY

Managing Acute Chest Syndrome in the emergency department

Labs and vitals alone cannot be used to diagnose or exclude ACS.

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A 22-year-old male with asthma and sickle cell disease (SCD) presents to the ED complaining of chest pain. He's wheezing and hypoxic, with an O₂ saturation at 94%. The nurse places the patient on oxygen as you contemplate the most important diagnostic and therapeutic considerations in this patient.

Acute Chest Syndrome

Acute Chest Syndrome (ACS) represents the second most common emergency presentation and the most common cause of death in patients with SCD.² **ACS is defined as a patient with SCD and a new pulmonary infiltrate on CXR** in conjunction with any of the following:

- fever $\geq 38.5^{\circ}\text{C}$
- hypoxemia ($>2\%$ decrease in SpO₂ from a documented steady-state value on room air or PaO₂ <60 mmHg)
- chest pain
- respiratory symptoms

There is considerable overlap between ACS and pneumonia (33% of ACS cases

are due to infection.)⁴ Asthma may confound the diagnosis, as there is a clear association between asthma and the development of ACS.^{12,17}

All suspected ACS cases should be evaluated with CBC, reticulocyte count, blood and sputum cultures, ECG, and a CXR. Development of ACS is often heralded by an acute drop in hemoglobin.²¹ **Labs and vitals alone cannot be used to diagnose or exclude ACS.** CXR is particularly helpful when there is a confounding diagnosis such as asthma. ACS is often not suspected prior to CXR findings in 61% of cases.¹⁰

An A-a gradient seen on ABG represents the best predictor of clinical severity.²⁸ However, while SpO₂ typically underestimates oxygenation, ABG may overestimate the oxygen pressure, as it does not account for mutant forms of hemoglobin.²⁷ The truest measure of oxygenation in SCD patients is co-oximetry.

ACS often develops after presentation for vaso-occlusive crisis (VOC).^{2,4,11} Atelectasis, fat embolism from bone infarction, infection, and pulmonary infarction may precipitate ACS.^{4,5} Atelectasis is caused by fluid overload and hypoventilation, either as a result of oversedation by opiates or, conversely, by splinting due to *under-dosing* of opiates and inadequate pain control. These nuances underscore the importance of the management initiated by the emergency physician.

Management

The important considerations in a patient with ACS are appropriate pain control, asthma therapy, incentive spirometry, antibiotics, judicious oxygen and fluids, and the *only* definitive therapy: simple or exchange blood transfusion.

Pain: SCD pain in the emergency department is notoriously under-treated.^{20,29} Pain should be frequently reassessed and controlled with IV opiates.^{1,20,27} **The goal should be to actually control pain, not simply treat it as it occurs.** SCD patients have a high prevalence of sub-clinical renal disease and NSAIDs are relatively contraindicated.^{1,20,27} Care should be taken to avoid oversedation, which can lead to hypoventilation and atelectasis.

Respiratory therapy: Incentive spirometry decreases the development of pulmonary infiltrates and atelectasis by 37% in patients with VOC. It should be employed in all patients admitted with SCD.¹³

Asthma therapy: Patients with asthma and ACS should be treated similarly to other asthmatics, according to NIH guidelines.²³ Although steroids have been shown to shorten hospitalization in patients with ACS, they are also associated with an increased frequency of rebound VOC and high re-hospitalization rates (25%). Systemic steroids should be reserved for true asthma exacerbations.^{24,25}

IV fluids: Although dehydration can induce sickling, overhydration can cause

atelectasis and worsen ACS. Hypotonic fluids can reduce sickling. D5 1/2 NS should be used at no higher than 1.5 times maintenance unless the patient is overtly hypovolemic.^{1,14,27}

Antibiotics: Although typical organisms predominate in ACS with infection, SCD patients are also functionally asplenic and therefore susceptible to infection by encapsulated organisms.^{4,20,21,27} **Empiric antibiotic coverage should be directed toward both typical and atypical organisms** – it should include a 3rd generation cephalosporin and a macrolide.

Oxygen and noninvasive ventilation: Oxygen therapy can combat hypoxic vasoconstriction and sickling, but it is only indicated in the hypoxic patient. There is no evidence that routine oxygen therapy is helpful in non-hypoxic patients. Overuse of oxygen therapy may lead to delayed recognition of clinical deterioration and bone marrow

suppression. Noninvasive ventilation (NIV) in ACS improves respiratory rate and gas exchange, but lessens patient comfort and does not improve outcomes or hospital length of stay.³⁰ NIV is not recommended in routine treatment of ACS.

Transfusion: Simple or exchange blood transfusions decrease the proportion of sickle red cells and increase oxygen affinity of blood in SCD.¹⁵ Although no prospective data demonstrates that transfusion improves outcomes, **transfusions have been shown to prevent ACS in perioperative patients.**^{4,13,26} Based on extrapolation of this data – and on the demonstrated ability of blood transfusion to improve oxygenation in ACS patients – the NIH recommends transfusion for patients with a PaO₂ < 70mmHg.

In reality, the decision often is made clinically. The practice of early transfusion is thought by experts to be

one reason behind declining mortality rates in ACS.²¹ Although exchange transfusion has not been proven superior to simple transfusion, it is preferred in patients with hemoglobin >10 or in rapidly progressive ACS to avoid complications of hyperviscosity such as stroke. Blood transfusion should be initiated in the emergency department after appropriate cross matching to prevent alloimmunization.⁴

Summary

ACS is a life-threatening complication of the most common genetic disease in the United States. Prompt recognition of the diagnosis, coupled with an evidence-based strategy of pain control, antibiotics, judicious oxygen and IV fluids, appropriate asthma therapy, incentive spirometry, and swift initiation of simple or exchange blood transfusion can limit morbidity and reduce mortality in patients with ACS. ★

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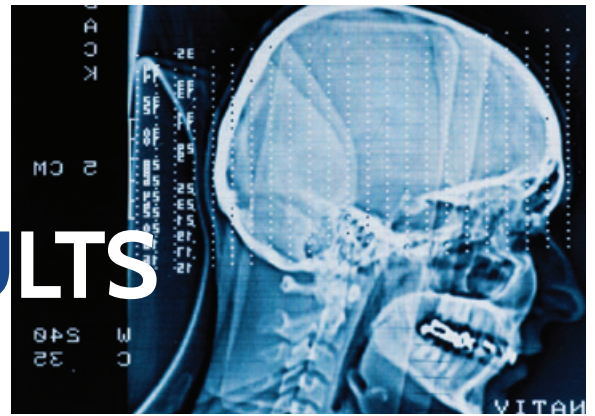


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RISK MANAGEMENT PITFALLS SEVERE TRAUMATIC BRAIN INJURY IN ADULTS



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- 1** “The patient was in a car crash and had an obvious femur fracture. I didn’t think he needed a point-of-care glucose, given the obvious trauma.” All patients with altered mental status must have point-of-care blood glucose testing. Hypoglycemia and hyperglycemia can cause altered mental status, but they are easily reversible with treatment. In patients with a severe TBI, hyperglycemia or hypoglycemia may worsen neurologic outcomes if it is not urgently addressed.
- 2** “The patient smelled of alcohol and was obviously intoxicated.” Over 60% of all severe TBIs are complicated by alcohol or drug intoxication, which may worsen morbidity. Blood alcohol levels and urine toxicology screens may help prove concomitant intoxication, but based on available history and physical examination, a patient should be aggressively resuscitated for severe TBI.
- 3** “I assumed her TBI took precedence and didn’t realize she also had a cervical spine fracture.” All patients with a severe TBI should be assumed to have a concomitant spine injury until proven otherwise, and spinal immobilization should be maintained. A patient with a severe TBI will be clinically unreliable, and the forces to generate a severe TBI should be assumed to have been transmitted to the spine.
- 4** “The CT was normal, so I didn’t think she had a TBI.” Diffuse axonal injury often has a benign CT appearance, and it contributes significantly to the morbidity and mortality of severe TBI. Patients with diffuse axonal injury are especially susceptible to secondary injuries from hypotension and hypoxia and should be resuscitated aggressively, based on available history and the physical examination.
- 5** “The patient had a GCS score of 13 when she arrived but then had a 3-minute generalized tonic-clonic seizure. Afterwards, she didn’t return to her previous baseline, so I presumed she was just postictal.” If a patient does not return to the previous neurologic baseline after a seizure, be concerned about nonconvulsive status epilepticus or a worsening intracerebral process. Repeat a noncontrast head CT and work quickly to arrange electroencephalograph monitoring. The patient should be aggressively treated for potential status epilepticus, and other causes for neurologic deterioration should be investigated.
- 6** “The patient had a stable GCS score of 10 an hour ago, but we just discovered he has a blown pupil.” TBI is a dynamic process, especially in the first 24 hours. These patients should be monitored closely, and the emergency clinician should anticipate deterioration and be prepared to intervene immediately.
- 7** “The patient had a GCS score of 3, and the intern performed the intubation. It went well, but the postintubation blood gas showed a PaCO₂ of 20 mm Hg.” Care must be taken to avoid routine or prophylactic hyperventilation. Monitor the respiratory rate, especially immediately postintubation when the patient is hand-bagged. The resultant vasoconstriction from lowering the PaCO₂ can decrease cerebral blood volume and CPP, worsening secondary injuries.
- 8** “The patient’s blood pressure kept dropping to 80 mm Hg, and despite 4 L of normal saline, I couldn’t keep him normotensive, so I started norepinephrine.” Over 60% of patients with a severe TBI have other occult traumatic injuries. A hemodynamically unstable patient should initially be assumed to be in hemorrhagic shock and the source of bleeding investigated. Even a single episode of hypotension can worsen neurologic morbidity and mortality.
- 9** “The patient had a GCS score of 9, and the CT didn’t look that bad, so I admitted him to our local community medical ICU.” Patients with a severe TBI should be managed with early collaboration with trauma surgery and neurosurgery. Special consideration should be given to managing these patients in a neurologic ICU by neurointensivists or intensivists with experience managing neurologic disorders and secondary injury after severe TBI.
- 10** “I gave my patient lidocaine as an ICP pretreatment medication prior to intubation, but while I was waiting 3 minutes for it to circulate, her SpO₂ kept dropping below 90% and she seemed to aspirate.” Prevention of hypoxia and hypotension are key in avoiding secondary injuries. Given the data on pretreatment to blunt ICP elevations prior to intubation, care should be taken to efficiently intubate the patient without hypoxia or hypotension, even at the expense of a pretreatment agent. ★

RISK MANAGEMENT PITFALLS

PEDIATRIC DIABETIC

KETOACIDOSIS



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- 1 **“The patient didn’t appear to be severely dehydrated, so I waited to see if she could tolerate oral liquids.”**
Patients in moderate or severe DKA should be assumed to be 7% to 10% dehydrated, and although rehydration should proceed at a carefully calibrated, gradual pace, there should be no delay in administering IV fluid therapy.
- 2 **“The patient was tachycardic, so I gave several boluses of NS.”**
The risk for cerebral edema increases with overly aggressive fluid supplementation (i.e., volume and rate of administration). If the blood pressure is normal and peripheral perfusion is adequate, conservative rehydration is preferred.
- 3 **“I wasn’t sure if the patient’s lethargy, tachypnea, and vomiting were due to increased intracranial pressure, so I delayed giving mannitol until performing a head CT.”**
DKA-related cerebral edema is a clinical diagnosis, and therapy to reduce intracranial pressure should commence prior to confirmatory imaging.
- 4 **“The serum potassium concentration was 4.2 mEq/L on admission, so I withheld potassium supplement during hour 2.”**
Total body stores of potassium are depleted with DKA. Hypokalemia should be anticipated with initiation of insulin replacement and correction of acidosis; therefore, potassium should be added to the IV fluids after the initial hour of rehydration.
- 5 **“The patient had severe hyperglycemia, so I gave him a bolus of regular insulin during the initial hour of therapy.”**
A bolus of regular insulin during the first hour of therapy has been associated with increased risk for developing cerebral edema. Insulin should never be bolused and should not be administered prior to the second hour after NS rehydration. Hydration alone will cause the plasma glucose concentration to decrease rapidly.
- 6 **“Why should I do an ECG if I’m measuring the serum potassium on admission?”**
The ECG is a reflection of the intracellular potassium level (which is distinct from the extracellular serum concentration [measured]) and can show signs of intracellular potassium deficiency when the measured serum potassium concentration is normal.
- 7 **“The blood glucose was dropping below 200 mg/dL, so I decreased the insulin infusion.”**
The insulin infusion should never be decreased for falling glucose levels; rather, the amount of glucose infused should be increased by providing 10% dextrose solution so as to continue inhibition of ketogenesis and prevent hypoglycemia.
- 8 **“During transport to CT, I turned off the insulin infusion until we returned to the ED.”**
The insulin infusion should never be discontinued; the half-life of insulin in the serum is only six minutes.
- 9 **“The admission serum glucose was 828 mg/dL and the serum pH was 7.34, so I started the DKA protocol.”**
DKA is present only if there is metabolic acidosis.
- 10 **“The patient has type 2 insulin-resistant diabetes and therefore cannot have DKA.”**
DKA is not uncommon with type 2 diabetes; up to 25% of patients with new-onset type 2 diabetes can present in DKA. Recommendations deviating from standard insulin therapy are entertained. ★

A ROUGH LIFE

with a Tough Prognosis



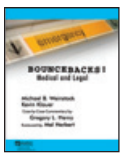
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In Bouncebacks, we provide the documentation of an actual patient encounter, discuss patient safety and risk management principles, and then reveal the patient's "bounceback" diagnosis.



The cases are adapted from the book Bouncebacks! Emergency Department Cases: ED Returns

(2006, Anadem Publishing) available at www.amazon.com and www.acep.org, which includes 30 case presentations with risk management commentary by Dr. Gregory L. Henry, past president of The American College of Emergency Physicians, and discussions by other nationally recognized experts.



In 2012, the second book in the series was printed; Bouncebacks: Medical and Legal which follows the stories of 10

patients from the initial visit to the attorneys desk, including courtroom testimony and settlement decisions. Authors: Drs. Michael Weinstock, Kevin Klauer, and Greg Henry, with forward by Mel Herbert.

This month's case is from the book *Bouncebacks: Medical and Legal* by Weinstock, Klauer, and Henry published in 2011. It is formatted similar to the TV show, *Law and Order*; the first half of each case is the medical, and the second half is the legal – "Objection!" "Overruled!"

This case gets to the root of a thorny issue in emergency medicine: Our patients are being treated by people who have decided to defer immediate gratification for four years of college, four years of medical school, and then residency...you! Can we really relate to the underprivileged? Those left behind? Those who are victims of bad luck and bad romances, who didn't get algebra, and definitely didn't get the importance of staying in school?

Even further, do we care less about a patient's health when they don't seem to want to manage it themselves? The noncompliant, the obese, the frequent ED utilizers? How about the lovers of tobacco and illicit substances?

My final question is easy to answer as a reader of a *Bounceback* case, but not as easy as at the bedside: *Has anyone ever been cured by a therapeutic wait?*

Part 1 – Medical *The Patient's Story*

Crystal has not had it easy. At age four, her father moves her to Louisiana. She only saw her mother once more, briefly. Becoming pregnant in the 12th grade, she drops out of school and moves in with the soon-to-be father. Her pregnancy is complicated by anemia so severe she requires a blood transfusion, but she delivers a healthy daughter.

It's not long before she becomes pregnant again with the same man and delivers another healthy daughter. Her boyfriend leaves soon after, and Crystal moves into a mobile home, all the while working as a housekeeper at the Shifting Sands Resort Hotel. He is not soon forgotten;

she is arrested in 2000 for smashing his windshield and slashing his tires.

Crystal and her two daughters move out of the mobile home shortly after the floor in the bathroom falls through. Bad goes to worse as she is fired due to a misunderstanding about vacation. She wanders from job to job, first in another hotel then in a children's daycare. Times remain rough. There is a 45-minute commute each way and she quits work when her car breaks down.

In 2002, her children go to live with their father. Crystal is pregnant again from a one-night stand. It is during this pregnancy that she learns of her mother's sudden death. Crystal is admitted to a psychiatric ward for almost 10 days. A third C-section results in a healthy baby girl at Cape Hope Hospital in 2003. Crystal calls her Joy. With a new child, she attempts to get her two eldest back, but their father refuses. One night she arrives home to find her apartment building surrounded by emergency vehicles and is told her boyfriend has burned it down.

In 2005, Crystal is stopped for a traffic violation and the police notice her child is not in a car seat; she is cited. She does not show up for the court date and her driver's license is revoked. She now receives government assistance with food stamps and is placed on Medicaid. With no way to get to work and a young child to care for, she moves into a shelter.

Saturday, April 7, 2006 is Joy's third birthday. The shelter helps by throwing a party at Chuck E Cheese's. While there, Crystal develops a headache that persists through the weekend.

Tuesday, April 10, 2006 – Crystal is at the shelter and reaches for her daughter's car seat to put her into the daycare van. She has a sudden onset of a hand cramp, then falls to the floor and cannot get up for three minutes. She calls for help but then finds she is able to walk. She is driven to the ED.

26-Year-Old Woman with Weakness and Falls

The Doctor's Version

The following is the actual documentation of the providers

Date: April 10, 2006 at 09:58

Chief complaint (per RN): "Fell/numbness to leg"

Vital Signs

Time: 10:10 **Temp (F):** 98.5 **Rt.: O Pulse:** 62

Resp: 16 **Syst:** 122 **Diast:** 83 **Pos.:** S

Pain Scale: 0 **pulse ox:** 100%

HPI (11:15) (Note: all documenting, ordering, and treatment per physician assistant-PA)

Right leg and arm numbness last night and today with fall × 2 – denies previous or current injury. Severity mild-moderate. Weakness RUE and RLE, which is new. Numbness × 2 episodes, approx 1 minute each. No problems with vision, impaired speech, difficulty swallowing, confusion. She has approx 1/2 of prescription for Septra remaining → "makes me sick." Pt. reports prior Hb 6.7 → "taking iron."

Past Medical History

NKDA

Meds: Septra, Zyrtec, Flexeril

PMH: Anemia

PSH: C/S × 3

SH: Smoker > 2 PPD, alcohol – none, drugs – none

Exam (shortened)

PSYCH: Mood and affect are normal

EYES: PERRL

NECK: Supple

CARD: Regular rate and rhythm, ht. sounds nl

RESP: No respir distress, breath sounds nl

ABD: Nontender, no organomegaly

NEURO: Cranial nerves normal as tested.

EOM's intact, PERRL, cerebellar normal as tested. No motor or sensory deficit.

Reflexes normal.

ED Course

11:15: Orthostatic VS: Laying BP 130/43 and pulse 65 → Standing 145/80, pulse 56

12:15: Tylenol 975mg PO – Note: Pt. refused. "I've already tried Tylenol and Motrin"



13:00 (per RN): X-ray tech informed me pt removed IV "because it hurt" – Pt told to sign an AMA form.

Testing

WBC 9.2, Hb 7.6, plt 1,342,000, Lytes, BUN/creat – WNL, LFT's WNL, glucose 92, pregnancy test – neg

CT scan head – Indication: Head Pain.

Interpretation: Normal per radiologist

Urine toxicology screen: Positive for marijuana

Diagnosis (14:45): Sinusitis, substance abuse, paresthesias, anemia.

Discharge (15:15): Per RN: Discharge instructions given. Verbalized understanding. Discharged home. Rx doxycycline 100mg Q12 hours #20, Motrin 800mg q8 hours PRN pain, F/u with PCP ASAP for recheck and further Tx, return with increased symptoms or problems.

THE ERRORS – RISK MANAGEMENT/PATIENT SAFETY ISSUES

Risk management/patient safety issue #1

Error: Poor history of present illness (HPI)

Discussion: This is a common theme; it's hard to read this HPI and really understand what is going on. One thing is clear – this is not the patient to increase your 'throughput' numbers.

Did the poor history become a legal issue? You betcha!

Q. (Plaintiff attorney): Doctor, when you reviewed Ms. Johnson's chart, did you note her history of right-sided leg and arm numbness and the fact that she had fallen within the previous 12 hours?

A. (Defendant physician) Well, in terms

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of the fall, sir, I need – I need more information to make any assessment because it was not clear from the history about the fall as to why she fell. From [the history] she did fall twice, he (the PA) said. Whether she lost her balance, whether she was dizzy, you know, and did she actually hit the ground or just lose her balance, I don't know. So that fall, I could not make any conclusion, because she – she said that she didn't injure herself. So, whether she didn't actually hit the ground and just lost her balance, I cannot make any conclusions about that fall.

The doctor was left to defend an incomplete evaluation performed by someone else. Is the 'poor historian' the patient... or the doctor?

Teaching point: This is not fast food – when there is diagnostic uncertainty make sure every bit of data available has been obtained.

Risk management/patient safety issue #2

Error: Not evaluating risk factors

Discussion The inclusion of risk factors has lately become controversial. Do risk factors really matter with a history of exertional chest pain, dyspnea, and diaphoresis? The T-sheet chart had a section for family history but was left blank. Crystal's deposition revealed what should have been included there – history of stroke in her 16-year-old sister and both parents. Even for those who are not a big fan of risk factors (me), this family history is concerning for a genetic hypercoagulable link, particularly with a platelet count over 1 million.

Teaching point: Sometimes risk factors matter.

Risk management/patient safety issue #3

Error: Not asking for help

Discussion: This is one of the nice parts of our job – we always have a lifeline to 'call a friend.' The MLP can call the physician, the resident can discuss with the attending, the physician can call the specialist. The trick is knowing *when* to ask for help. Diagnostic uncertainty in the face of a potentially life-threatening complaint should sound alarm bells.

Teaching point: The ED partnership should function as a team

Risk management/patient safety issue #4

Error: Unaddressed contradiction in chart

Discussion: The brain CT indication says 'head pain' but this is not mentioned in the HPI. Did she really have head pain or was the PA forced to pick from a list of indications? If she did have head pain, questioning about onset and other symptoms such as fever would have been helpful. If she did *not* have head pain, documenting such in the face of other neuro symptoms was essential.

Teaching point: All patient complaints should be explored in the H&P.

Risk management/patient safety issue #5

Error: Over reliance on testing

Discussion: It seems most likely the brain CT was done to evaluate for TIA or CVA, not headache. During the PA's deposition, he admitted that his understanding was a negative CT excluded TIA or CVA. Reliance on a negative CT in the evaluation of cerebrovascular disease is a misapplication of data.

Teaching point: Understand limitations of testing.

Risk management/patient safety issue #6

Error: Not recognizing the dangers of thrombocytosis

Discussion: Thrombocytosis is an uncommon diagnosis and its acute management will exceed the bounds of many emergency physicians. However, it does not take a brain surgeon (or hematologist) to recognize that when the platelets are *3 times* the upper limit of normal, there may be extra clotting. Faced with an overweight patient with new onset unilateral arm and leg weakness, whose sister and parents all had strokes, thrombocytosis tips the scales in favor of an acute neurologic event.

Teaching point: If you order testing, be prepared to address abnormal results.

Risk management/patient safety issue #7

Error: Going one on one with the patient

Discussion: This chart reads like a battle: Who is forced to sign an AMA form when they don't want an IV, particularly if the patient is soon to be discharged? And the diagnosis of 'substance abuse'? Is there a contention she had these symptoms because of marijuana use? Really??

Teaching point: If you are going up against the patient, be prepared to lose (i.e., it's *Bounceback* time – see below!)

THE BOUNCEBACK

Crystal is asymptomatic after ED discharge on Tuesday, but the next morning, she wakes to go to the bathroom and: "I just start falling." She gets back to sleep and then per routine is awoken by the church at 6:00 am. After she gets her daughter off to daycare, she is driven to the Rocky Fork Department of Social Services building. While waiting to be seen, she experiences "sweat pouring down my face... I can't see nothing... slurry speech and real bad headache." Medics are called:

EMS final report: 26 y/o female complaint headache with burning sensation across her nose. Pt was seen at Cape Hope yesterday and treated for sinusitis. Patient requests transport to ED for evaluation again today. Patient transported w/o incident or delay to lead charge nurse and then to triage.

ED Visit Two, Wednesday, April 11, 2006

- 10:32 – (RN #1): Triage and placed in waiting room. "Pt. here via EMS with c/o HA. States seen here yesterday and dx with sinusitis and given Rx for same but has been unable to get filled. Pt. A&O x 3. NAD.
- 10:48 – (RN #2): One episode emesis. Pt comes to triage desk stating "I feel sick" and not answering detailed questions. "Pt. dx with sinusitis yesterday and has not taken Rx. Pt. vomited in triage, clear, frothy emesis, resp easy, skin W/D." Returned to waiting room.
- 11:49 – (RN#2): Comes back to triage desk stating "I feel really sick." Per RN: "Resp easy, skin W/D, no more episodes of vomiting, pt. stable." Returned to waiting room.
- 13:56 – Name is called and she is placed in an ED room (3 hours and 23 minutes after arrival)

LESSONS

There are many lessons in this case, but the most important are:

1. Take responsibility for your patients and recognize which require extra time. Ensure there is an open line of communication between the provider and the supervising physician, whether a MLP or an EM resident.
2. There will always be patients we don't click with. Step outside the room, take a deep breath (or two) and start again.
3. Ensure the chart makes sense. It should read like a story with a logical and predictable ending. In this case, the history didn't lead to anything – except an article in EMRA's magazine!

To find additional information about this case and others, including deposition and trial testimony, opening and closing statements, and appeals decisions, visit us at www.embouncebacks.com.

- 14:45 – Pt. is aphasic, will only moan. “Unable to test strength due to slow or no response to commands. Will withdraw right arm from deep pain 2/5 strength.” Brain CT – Acute CVA left middle cerebral artery distribution
- **Diagnosis:** Acute CVA with aphasia and right hand hemiparesis → admission
- **Inpatient neuro consult:** “Suspect stroke is secondary to the thrombocytosis and related hyperviscosity syndrome”
- In-hospital testing reveals 90% left carotid artery stenosis
- **Disposition:** After eight days in the hospital, she is discharged for outpatient rehabilitation

Outcome: Crystal now lives with her 7-year-old daughter, Joy. With rehab, her condition has improved and she is able to walk her daughter to the bus stop across the street, but cannot walk her as far as the park. Her speech is not clear, and her thought processes have not returned to baseline. She is embarrassed to be seen, spending most of her time in the house. There are no family contacts and few friends. A nurse's aide visits the house for several hours three times a week to help with basic activities of living.

At a five-hour deposition on February 16, 2010, she stated that the last contact with her first two daughters was in October 2009. She tried to call at Christmas, but the phone disconnected.

Part 2 – Legal

Author's note: Seems like no one liked this patient – not the 'AMA' PA who saw her initially; not the paramedics who had to transport the patient “again” (read their note); and certainly

not the nurses in triage, who tried to “cure” her with a therapeutic wait.

Could Crystal's TIA have been diagnosed at the initial visit? If she were admitted, would it have changed the outcome? How did this play out legally?

THE DEPOSITIONS (January 2010)

Author's note: This case presents significant difficulties for the defendants; both the PA and physician were named. The PA testified that he discussed the case with the attending, but there was no notation of that on the chart. Despite signing the chart, the attending did not have any recollection of the discussion. Watch how the plaintiff's attorney plays the PA off of the attending:

Deposition of physician assistant Scott Davidson by plaintiff attorney Krause

Q. Was there always during your tenure at Cape Hope, was there always an emergency physician in the emergency department?

A. Yes, sir.

Q. All right, sir. And do I understand that always you would discuss the care and disposition with the emergency physician prior to the patient being discharged?

A. Every case.

Q. And as it pertains to Crystal Johnson, who did you discuss her care with?

A. Dr. Aminah.

Q. Why did you do that?

A. That's what I do. That is the requirement we have – that I have with the supervising physicians. I discuss every patient with them. They are in charge and, therefore, I discuss all patients with them.

Deposition of ED attending physician Afram Aminah by plaintiff attorney Krause

A. (Dr. Aminah): Yeah. To the best of my recollection, sir, I don't remember Scott Davidson (PA) speaking to me about Ms. Johnson. If he did, I don't remember what he said.

Q. Doctor, were you in charge of Crystal Johnson's care while she was in the emergency department on April 10, 2006?

A. To the best of my recollection, sir, I—I never did see Ms. Johnson. That's to the best of my recollection.

Q. So were you in charge of her care?

A. Well, I was a backup physician for [the PA] Scott Davidson, but to the best of my recollection Scott Davidson never did discuss Ms. Johnson. If he did, you know, I don't remember and also I did not see Ms. Johnson.

Q. So that I can make sure that your answer is clear —

A. Yes, sir.

Q. I understand then the answer to my question to be no, you were not in charge of Crystal Johnson's care while she was in the emergency department on April the 10th of 2006. Is that correct?

Mr. Scoville (defense attorney): Objection.

A. I was —

Q. (defense attorney): You can answer.

A. I was the backup physician, sir, and I think to the best of my recollection Scott Davidson never discussed with me Ms. Johnson. And if he did, I don't remember, sir.

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BOUNCEBACKS

continued from page 47

Author's note: Now we have the defendants are battling each other... not good! How about missing the diagnosis of TIA – was the poor history lost on the plaintiff?

Continued deposition of ED attending physician Afram Aminah by Plaintiff attorney Krause

Q. From your review of her chart, would you have included TIA in your differential?

A. Well sir, to me, I'll have to see a patient, evaluate and, you know, see what the past medical history is, what treatment they received, what's the current treatment, and review their studies, and then I can formulate, you know, an opinion as to what is the problem.

Q. Yes, sir. But you've reviewed Ms. Johnson's chart of April 10, 2006, correct?

A. Yes, sir.

Q. And you've reviewed it thoroughly, correct?

A. What do you mean by "thoroughly," sir?

Q. Well, you've been sued, doctor. I mean, I assume you've reviewed Ms. Johnson's chart given the allegations that have been made against you. I assume that you've reviewed it thoroughly, have you not?

A. I have –

Mr. Scoville (defense): Objection. At the start [of the deposition] you asked him if he didn't understand the question to let you know and he told you he didn't understand 'thoroughly,' and so I object to your lecturing the witness.

By Mr. Krause (plaintiff):

Q. Well, do you understand the term "thoroughly?"

A. I've reviewed Ms. Johnson's chart, sir.

Author's note: Uhhhh...

Q. All right. Based upon your review of her chart, would you have included TIA in her differential had you been the medical professional who saw her?

A. As I said, sir, there are a lot of conditions that cause transient neurologic symptoms and TIA is one of them.

Q. Yes, sir, and I understand that's what a differential is all about. My question is, had you seen Crystal Johnson on April 10, 2006, would you have included TIA in your differential? And if you can answer the question with a yes or no, please answer it with a yes or no and then please feel free to explain.

A. As I said, sir, when I evaluate the patient, sir, I have to take a history, do, you know, a physical exam, review of the medication, review the past history, past treatment, and then I can formulate an opinion as to what is the problem. And that's the normal and customary way that I follow a patient. And that's the best answer I can give you, sir.

Q. Okay. So—so my understanding is that Ms. Johnson's chart contains a history, correct?

A. Yes, sir.

Q. It contains her complaints, correct?

A. Yes, sir.

Q. It contains what medications that she was taking, correct?

A. Yes, sir.

Q. All right, sir. So my understanding is all of the things that you would do in the workup of a patient were done with Ms. Johnson? Doctor, you've been a teacher before, correct?

A. Yes, sir.

Q. All right. And you – you do case presentations to students when you teach, correct?

A. Yes, sir.

Q. All right, sir. Now, all of the things that you indicate that would be done in the workup of a patient, do you believe that they were done in the workup of Crystal Johnson?

A. Yeah. Reviewing the charts, sir, Ms. Johnson was evaluated, history was obtained, personal history was obtained and those studies were done.

Q. Doctor, let me just say this. I don't have to be anywhere until tomorrow, and I want to see if I can get an answer to this question. It's a hypothetical question, based upon your having – being a board certified emergency physician and someone who's been involved in teaching. And so my question is, based upon your review of this chart, what would you have done – I know you didn't see her – but what would you have done had you seen this patient based upon your review of this chart?

A. As I said, sir, from my review, Ms. Johnson had transient neurologic symptoms which resolved. As I said, there are many causes of that. TIA is one of them.

Author's note: Is the point made? I have been merciful to you, dear reader, as there were over 100 pages of almost identical testimony!

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BOARD REVIEW+

QUESTIONS

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

Provided by PEER (Physician's Evaluation and Educational Review in Emergency Medicine). PEER 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.

- Visceral abdominal pain is:
 - Intense and constant
 - Midline and bilateral
 - Sharp and well localized
 - Transmitted by somatic neurons
- A 40-year-old man from Arizona presents with right upper-quadrant abdominal pain and a cough with thick, dark sputum. Ultrasonography demonstrates a large right-sided pleural effusion as well as a 7-cm hypoechoic liver lesion with thick irregular walls. What is the most appropriate treatment?
 - Ampicillin 2 g IV and gentamicin 2 mg/kg IV
 - Levofloxacin 750 mg IV
 - Metronidazole 750 mg IV
 - Paromomycin 500 mg orally
- A 6-year-old boy presents after knocking out his primary left upper central incisor. His mother has the tooth in a cup of milk. Which of the following statements describes appropriate management?
 - Length of time the tooth is out of the socket does not affect replantation
 - The tooth should be wiped off then replanted
 - The tooth should not be replanted
 - Water would have been a better transport medium
- A 40-year-old woman is sent from her dentist's office for evaluation of elevated blood pressure. She has had intermittent headaches for 2 or 3 weeks but denies blurry vision or other complaints. Vital signs include blood pressure 240/140, pulse 90, respirations 16, and oxygen saturation 100% on room air. Physical examination, laboratory test results, and chest radiographs are unremarkable. An ECG reveals high voltage consistent with left ventricular hypertrophy. Which of the following is the appropriate management strategy?
 - Enalapril administered intravenously if the patient is pregnant
 - Hydrochlorothiazide administered orally and discharge with instructions to follow up with primary care physician within 1 week
 - Metoprolol administered intravenously because of the ECG findings
 - Nitroglycerin administered intravenously to normalize blood pressure to 140/90 within two hours
- A 25-year-old man presents with high fever and stridor. He has been sick for 2 days with a sore throat. He reports pain with swallowing and has a muffled voice. What should be the next step in management?
 - Albuterol
 - Emergent tracheostomy
 - Lateral soft tissue radiographs of the neck
 - Steroids

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ACEP UPDATE (P. 5)

Come Together

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RESIDENT RESEARCH (P. 6)

Landmark Article Series

1. Wells PS, Anderson DR, Bormanis J, et al. Value of assessment of pretest probability of deep-vein thrombosis in clinical management. *Lancet* 1997; 350: 1795-1798.
2. Wells PS, Anderson DR, Rodger M, Forgie M, et al. Evaluation of D-Dimer in the Diagnosis of Suspected Deep-Vein Thrombosis. *N Engl J Med* 2003; 349(13): 1227-35.
3. Wolf SJ, McCubbin TR, Feldhaus KM, Faragher JP, Adcock DM. Prospective validation of Wells Criteria in the evaluation of patients with suspected pulmonary embolism. *Ann Emerg Med*. 2004; 44(5): 503-10.
4. Dong BR, Hao Q, Yue J, Wu T, Liu GJ. Thrombolytic therapy for pulmonary embolism. *Cochrane Database of Systematic Reviews* 2009, Issue 3. Art. No.: CD004437.
5. Well's criteria for DVT (Wells *et al*, *Lancet* 1997) were used to determine pre-test probability and scoring is in the table below:

Clinical Characteristic	Score
Active cancer (treated within past 6 mos, or currently receiving palliative treatment)	1
Paralysis, paresis, or recent plaster immobilization of lower extremities	1
Recently bedridden for 3+ days, or major surgery in previous 12 weeks requiring general or regional anesthesia	1
Localized tenderness along the distribution of the deep venous system	1
Entire leg swollen	1
Calf swelling at least 3cm larger than asymptomatic side (measured 10cm below tibial tuberosity)	1
Pitting edema confined to symptomatic leg	1
Collateral superficial veins (nonvaricose)	1
Previously documented DVT	1
Alternative diagnosis at least as likely as DVT	-2

Scoring is as follows:

- ≥ 2 : probability of DVT likely
- < 2 : probability of DVT unlikely
- In patients with symptoms in both legs, the more symptomatic leg is used

CRITICAL CARE (P. 20)

Neutropenic Fever in Cancer Patients

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Backyard Politics

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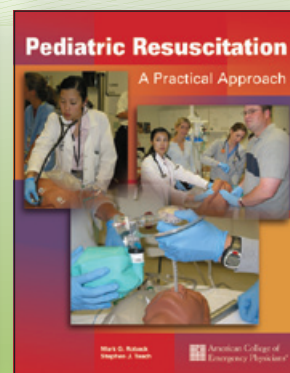
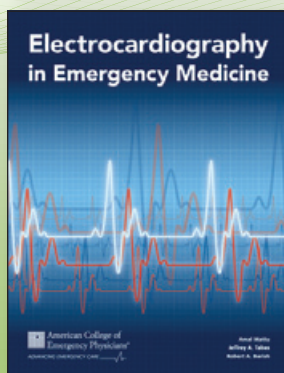
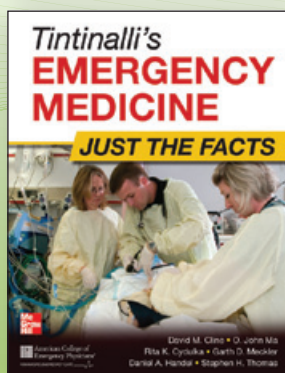
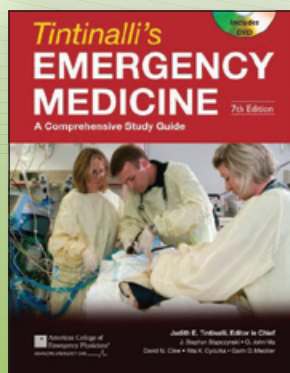
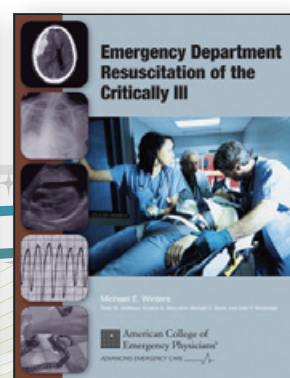
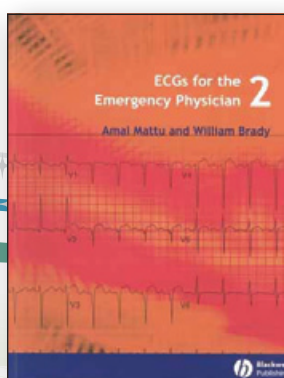
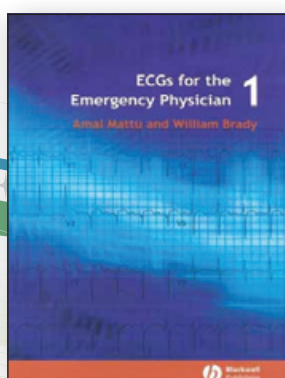
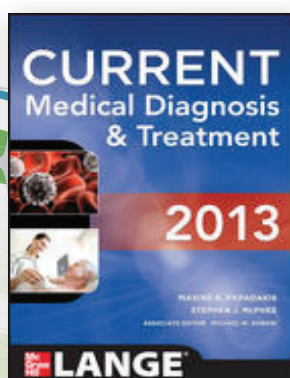
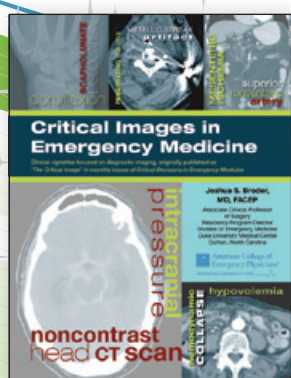
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GUIDELINES

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All positions advertised in *EM Resident* must be limited to board-certified/board-prepared (BC/BP), residency-trained emergency physicians. For the sake of terminology consistency, the terms, "ED," "Emergency Department," and "Emergency Physicians" are preferable over the use of "ER" or any derivation. In addition, board-certified/board-prepared (BC/BP) is required over board certified/board eligible (BC/BE). *EM Resident* has the right to refuse an advertisement if such guidelines are not met.

DISPLAY ADS

Placement of all ads other than premium ads, is at the discretion of the publisher. All efforts are made to preserve advertising materials in their original condition; however, the publisher is not responsible for lost or damaged advertising materials after publication. All advertising is subject to the approval of EMRA. Payment must accompany order. All rates are non-commissionable. All cancellations must be in writing. Any cancellations received after space deadline will not be refunded.

CLASSIFIED ADS

Copy for classified ads must be submitted via email; space will not be reserved until payment is received. Classified ads are placed in alphabetical order by state, then city, or under a "Multi-State" heading.

Classified Ad Rates		Color Block Background	
1x		1x	
Up to 150 words	\$283	Up to 150 words	\$365
Up to 300 words	\$504	Up to 300 words	\$567
3x		3x	
Up to 150 words	\$236	Up to 150 words	\$315
Up to 300 words	\$441	Up to 300 words	\$535
6x		6x	
Up to 150 words	\$201	Up to 150 words	\$252
Up to 300 words	\$378	Up to 300 words	\$441

ADD LOGO ARTWORK TO CLASSIFIED
 Black & White: \$75.00 or
 Color: \$100.00 per listing/per issue

Placement/Size/Color	# of Runs		
	1x	3x	6x
Covers (4 color only)			
Inside front (IFC) 7.5" x 10"	\$3510	\$2875	\$2145
Inside back (IBC) 7.5" x 10"	3510	2875	2145
Outside back (OBC) 7.5" x 7.5"	4500	3450	2475
Four Color			
2-page spread	\$4050	\$3450	\$3053
Full page 7.5" x 10"	2362	1811	1473
1/2 page vertical 3.5" x 10"	1228	1086	953
1/2 page horizontal 7.5" x 4.75"	1228	1086	953
1/3 vertical 2.25" x 10"	976	814	693
1/4 page 3.5" x 4.75"	724	543	433
Spot Color			
Add 25% to the black-and-white rates for each additional color.			
Black and White			
2-page spread	\$2700	\$2300	\$2035
Full page 7.5" x 10"	1575	1207	981
1/2 page vertical 3.5" x 10"	819	724	635
1/2 page horizontal 7.5" x 4.75"	819	724	635
1/3 page vertical 2.25" x 10"	630	543	462
1/4 page 3.5" x 4.75"	441	362	288

Notes: Bleeds must be at least 9 points on each bleed side; all sizes are expressed width x length.

PRODUCTION MATERIALS

DIGITAL AD SPECIFICATIONS

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

Other acceptable formats:

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

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

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

ADVERTISING DEADLINES

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

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

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

Exciting Academic Opportunity

FACULTY

The Baylor College of Medicine, a top medical school, has recently developed an Emergency Medicine Program & Residency in the world's largest medical center. We are recruiting stellar Emergency Medicine BC/BE Clinician Educators and Clinician Researchers at all academic ranks who will be an integral part of building the future of Emergency Medicine at BCM. We offer a highly competitive academic salary and benefits.

The program is based out of Ben Taub General Hospital, a busy Level 1 trauma center in the heart of Houston that sees more than 100,000 emergency visits per year. BCM is affiliated with eight world class hospitals and clinics in the renowned Texas Medical Center. These affiliations, along with the medical school's preeminence in research, help to create one of the strongest emergency medicine programs/experiences in the country.

FELLOWSHIPS

The program also recruits annually for the following fellowship programs: Ultrasound, Global Health, Emergency Medical Services/ Disaster Services, and Administration.



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



St. Luke's
Roosevelt
Continuum Health Partners Inc.
Department of Emergency Medicine



The Global Health Division of the Department of Emergency Medicine at St. Luke's-Roosevelt Hospital is offering a

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Within this program, fellows will acquire public health and clinical training in the most pressing global health issues of our time.

Features Include:

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- Humanitarian Aid Course (IDHA) at Fordham University in New York City
- Book/Journal/Movie Club
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MULTI STATE



Northern Shenandoah Valley Region of VA-WV. Physician Opportunity. A private independent group of 10 at WVU Hospitals-East (City Hospital) since 1995 seeks a Board certified/prepared full time EM physician to work 9-hour shifts. Very stable group with 90 years of combined local experience offers: Rapid partnership track with competitive financial/benefit package; 53,000 annual visits, Level III facility; New 40-bed ED; Epic EMR with Scribes; Flexible scheduling; 45 hours/day physician coverage; A-rated malpractice with tail included; Tort reform recently withstood the constitutionality test at Supreme Court level; Perfect location in West Virginia's Eastern Panhandle, fringe-suburb of Baltimore, MD/Washington, DC, on the I-81 corridor with virtually *no traffic!*; Great schools, affordable housing, healthy economy, outstanding opportunities for relaxation and outdoor adventure. Contact Daryl LaRusso, MD, MPH, FACEP, phone (304-264-1287 x31701), E-mail (dlarusso@cityhospital.org).

ARIZONA

Casa Grande: EMP has excellent opportunities in Arizona and with Casa Grande Regional Medical Center. The hospital has an annual volume of 35,000 emergency patients and offers excellent services and back up including 24 hour hospitalists. A multi-million dollar ED expansion is planned to increase the department to 32 beds. Casa Grande is located just south of Phoenix and north of Tucson. Beautiful weather year round, unlimited outdoor activities and major metro areas a short distance away make this an ideal setting. Excellent compensation and benefits are available. For more information please contact Bernhard Beltran directly at 800-359-9117 or bbeltran@emp.com.

Cottonwood and Sedona: EMP has outstanding opportunities in Arizona with Verde Valley Medical Center in Cottonwood and Sedona. These state-of-the-art facilities see approximately 24,000 and 7,000 emergency patients respectively per year. Situated in a beautiful, scenic

area in North Central Arizona, Cottonwood combines the charm and friendliness of a small community with easy access to the metropolitan areas of Phoenix and Las Vegas and the charming college town of Flagstaff. Sedona is a beautiful tourist community located in Arizona's "Red Rock Country;" this outdoor paradise is surrounded by mountains, forests, creeks and rivers. Full-time/partnership opportunities are available for Emergency Medicine residency-trained and Board-Certified Physicians. EMP offers democratic governance, open books and bonus plus shareholder status. Compensation package includes comprehensive benefits with funded pension (up to \$33,500/yr.), CME account (\$8,000/yr.), and more. Contact Bernhard Beltran directly at 800-359-9117 e-mail bbeltran@emp.com.

CALIFORNIA

Madera: Excellent compensation package — Children's Hospital Central California: Full time opportunities for Pediatric Emergency



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- **Connect At Events:** Use our improved Event Connection™ feature to see who's attending ACEP's *Scientific Assembly* and EMRA's Job Fair.
- **Sign Up For eNewsletters:** Employment best practices and job tips are as close as your inbox.
- **Find Career Advice:** Access the latest tips to help you land the right position.
- **Tie It All Together:** Upload your existing CV or build a new one, and easily keep track of job applications.

And if you're hiring, there's something for you too. The newly redesigned **EM Career Central** is attracting lots of attention from qualified applicants. Take advantage of the additional traffic and put more jobs in front of the right candidates.

Are you ready for a career consult?
See what's new -
at EMCareerCentral.org today!



ADVANCING EMERGENCY CARE 



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Medicine Physicians. Join an outstanding team of fellowship trained/board certified pediatric emergency medicine physicians. Children's Hospital Central California sees over 77,000 pediatric ED pts./yr. with excellent back up, PICU, and in-house intensivist coverage. The ED physicians also staff the hospital-wide sedation service. The compensation package includes comprehensive benefits with funded pension (up to \$33,500 yr.), CME account (\$8,000/yr.), family medical/dental/prescription/vision coverage, short and long term disability, life insurance, malpractice (occurrence) and more. Contact Bernhard Beltran directly at 800-359-9117 or bbeltran@emp.com.

SOUTHERN CALIFORNIA

Rancho Mirage: Emergency Medicine – Excellent compensation with full-time/partnership opportunities. Eisenhower Medical Center is a modern hospital with a newly expanded state-of-the-art 42-bed Emergency Department and an annual volume of 66,000 patients. The community is nestled at the base of the San Jacinto Mountains in the Palm Springs area and is truly an outdoor paradise with gorgeous weather year round. Candidates must be Emergency Medicine residency trained. EMP offers a competitive hourly rate, plus democratic governance, open books, and excellent compensation/bonus, plus shareholder status after one year. Compensation package includes comprehensive benefits with funded pension (up to \$33,500/yr.), CME account (\$8,000/yr.) and more. Contact Bernhard Beltran directly at 800-359-9117 or e-mail: bbeltran@emp.com.

CONNECTICUT

Meriden, New London and Stamford: MidState Medical Center is a modern hospital situated between Hartford and New Haven seeing 55,000 EM pts./yr. Lawrence & Memorial is a Level II Trauma Center on the coast near Mystic seeing 48,000 pts./yr. The Stamford Hospital is a Level II Trauma Center seeing 48,000 ED pts./yr., located 35 miles from New York City near excellent residential areas. EMP is an exclusively physician owned/managed group with open books, equal voting, equal profit

sharing, equity ownership, funded pension, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, phone 800-828-0898 or fax 330-493-8677.

FLORIDA



Boynton Beach: Emergency Medicine opportunities in the “Sunshine State” with gorgeous beaches, golf and water sports. Hospital Physician Partners seeks qualified candidates for immediate opportunities in **Boynton Beach**. Full time EM trained physicians for a brand new 80 bed **state-of-the-art hospital** that opened in January 2013. This outstanding, fast-paced facility offers stable mid-level coverage, **excellent leadership** and **strong nurse support**. What's Important To You...Is What Matters To Us!® **Lucrative compensation**, paid malpractice with tail and **flexible scheduling**. Contact Molly Smith: 1-888-754-8885 ext. 5292; msmith@hppartners.com or visit www.hppartners.com.

East Central: Seeking Residency-Trained EM Physicians for desirable East Central Florida area. Join our fully democratic group and become a partner in 18 mos! EMPros serves 3 community hospitals with 130k total visits. Health, life, disability and 401(k) provided. Visit www.emprosonline.com to learn more and submit your CV.

GEORGIA

Atlanta: EmergiNet, a progressive, well-established physician owned emergency group has positions available for BC/BP, EM residency trained physicians at multiple facilities in the Atlanta area. We work as a team emphasizing quality emergency care, dedicated customer service, professional and personal growth. Fee-for service based compensation, plus benefits, in the \$350K range. Malpractice and tail coverage are provided. Flexible scheduling, no non-compete, and much more. E-mail CV to Neil Trabel, ntrabel@emerginet.com; fax 770-994-4747; or call 770-994-9326, ext. 319.

ILLINOIS

Chicago Heights/Olympia Fields, Joliet and Kankakee: EMP manages EDs at several community teaching hospitals seeing 32,000 – 75,000 pts./yr. with trauma center designations and EM residency teaching options. Positions are currently available at Franciscan St. James Health (2 campuses seeing 36,000 and 42,000 pts./yr.), Presence Saint Joseph Medical Center (75,000 pts./yr.) and Provena St. Mary's Hospital (33,000 pts./yr.). We are an exclusively physician owned/managed group with open books, equal voting, equal profit sharing, equity ownership, funded pension, full benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, phone 800-828-0898 or fax 330-493-8677.

MICHIGAN

Grand Blanc: Genesys Regional Medical Center is located 45 minutes north of metro-Detroit and minutes from a number of desirable residential areas. Genesys hosts both allopathic and osteopathic emergency medicine residency programs and sees 64,000 emergency pts./yr. We are an exclusively physician owned/managed group with open books, equal voting, equal profit sharing, equity ownership, funded pension, amazing benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, phone 800-828-0898 or fax 330-493-8677.

MISSISSIPPI



Various Cities: HPP was recently awarded a number of EM contracts in **Mississippi** in addition to our existing partnerships. As a result, we have immediate **Full and Part Time** Emergency Physician opportunities in Biloxi, Jackson, Brandon, Amory, Canton, Natchez, Clarksdale and Batesville. Our facilities offer diverse patient populations and **ED volume ranges from 15K – 50K**. Enjoy hourly pay rates in the **\$170-\$240 range** along with **relocation** and **sign-on bonuses!** Must be BC/BE in EM, IM or FP. What's Important To You...Is What Matters To Us!® **Excellent compensation,**



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MedExcel USA, Inc. MedExcel USA, Inc. is a regional Emergency Medicine, Urgent Care and Hospitalist Management Service Organization that has openings for EM physicians and residents looking to practice in New York state and Missouri. From low volume EDs to state-of-the-art urban trauma centers, MedExcel USA, Inc. provides physicians with a wide variety of practice settings. We have been recognized for our programs designed to improve patient flow and offer a quality driven, physician friendly environment with unparalleled career opportunities and professional development.

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Contact Mark Douyard at
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free & discounted CME, paid malpractice with tail and **flexible scheduling**. Contact Christina Plain: (800) 815-8377 ext. 5295; email cplain@hppartners.com or visit www.hppartners.com.

NEBRASKA

Omaha: BP/BC EM physician sought for 2014 opening with stable group. Enjoy the exceptional benefits of working within a regional group with a very appealing model. Premier Physician Services is an equity-ownership where physicians share in both the profits and the decisions. Our mid-sized group offers the flexibility and access of independent groups without sacrificing the financial stability of larger groups. Premier's excellent package includes guaranteed rate plus family medical, employer-funded pension, expense account, incentive and shareholder status with no buy-in. As Nebraska's largest city and a leader on "top cities to live in" lists, Omaha provides both metropolitan amenities and Midwestern charm. Home to several Fortune 500 companies, Omaha offers the U.S.'s largest community theatre, 11 colleges and universities and a world famous zoo. With its rich jazz history and reputation as the heart of the Midwest, there is also great cultural appeal. Contact Rachel Klockow, (800)406-8118, rklockow@premierdocs.com.

NEVADA

Henderson and Las Vegas: Full-time opportunity for Pediatric Emergency Medicine Physicians. Join an outstanding team of fellowship-trained/board-certified pediatric emergency medicine physicians at two sites. University Medical Center is a Level I Trauma Center seeing 31,000 pediatric ED pts. /yr. with excellent back up, PICU, and 24-hour in-house intensivist coverage. There is also an associated pediatric residency (36 residents). EMP offers democratic governance, open books, and excellent compensation/bonus, plus shareholder status. Compensation package includes comprehensive benefits with funded pension (up to \$33,500 yr.), CME account (\$8,000/yr.), family medical/dental/prescription/vision coverage, short and long term disability, life insurance, malpractice (occurrence) and more. Contact Bernhard Beltran at 800.359.9117, e-mail bbeltran@emp.com.

NEW JERSEY

Northern: Teaching Opportunity – Immediate need for Emergency Medicine residency-trained physicians for academic Level I Trauma Center in Northern New Jersey within an easy drive to Manhattan, Philadelphia or the shore. The state-of-the-art Emergency Department in this excellent hospital, which is a comprehensive stroke center, treats over 70,000 patients per year, and has an Emergency Medicine residency program and fellowship program. Pediatric emergency care is located in a separate location in the hospital, and services are provided by the Department of Pediatrics. Responsibilities include delivery of clinical services, research, teaching residents/PAs/medical students. Opportunities exist for involvement in research, EMS, Ultrasound, Toxicology. New initiatives are currently being planned for an observation unit and an urgent care center. The department has a growing toxicology service and an active clinical research program. Positions offer competitive

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OK, Durant

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NEW MEXICO



Albuquerque: Come **earn \$200-\$250 per hour** at "One of the Best Places to Work in Healthcare." Emergency Physician opportunities are available at the **Lovelace Health System** in beautiful Albuquerque. **Three Hospital System** with ED volumes ranging from 23K-33K. These are long term, **stable contracts** with a **strong leadership team**. Must be BC/BE in EM. Enjoy **flexible scheduling**, paid malpractice with tail and free & discounted CME. Contact Nicole Pletan: (877) 278-2056; email npletan@hppartners.com or visit www.hppartners.com.

NEW YORK

Brooklyn: Emergency Medicine Physicians Needed. NES Healthcare Group is seeking emergency medicine physicians for Lutheran Medical Center (LMC), Brooklyn, NY. LMC is a Level I Trauma Center and a designated stroke center. Candidates must be BC/BP EM and have current EM experience. Competitive compensation, incentive program, CME allowance and malpractice coverage provided. Contact: Megan Evans, Physician Recruiter, 800.394.6376, fax 631.265.8875, mevans@neshold.com.

Long Island, Albany and Cortland: Brookhaven Memorial Hospital Medical Center is in Patchogue on the southern shore of Long Island and sees 74,000 ED pts/yr. Cortland Regional Medical Center is a modern, full-service facility situated in the Finger Lakes Region between Syracuse and Ithaca (34,000 ED pts/yr). Albany Memorial Hospital has a new ED (44,000 pts/yr) and hosts EM resident rotations, while Samaritan Hospital in Troy is a respected community hospital minutes from Albany, seeing 46,000 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, phone 800-828-0898 or fax 330-493-8677.

NORTH CAROLINA

Charlotte: EMP is partnered with eight community hospitals and free-standing EDs in Charlotte, Gastonia, Lincolnton, Pineville and Statesville. A variety of opportunities are available in urban, suburban and smaller town settings with EDs seeing 22,000 -104,000+ pts./yr. EMP is an exclusively physician owned/managed group with open books, equal voting, equal equity ownership, funded pension, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, phone 800-828-0898 or fax 330-493-8677.

New Bern: Respected 313-bed regional medical center located at the intersection of the Trent and Neuse Rivers just off the central

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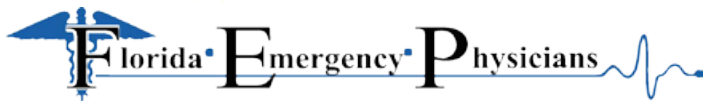
Florida Emergency Physicians (FEP) is celebrating over 40 years as a stable organization serving Florida Hospital in the largest ED system in the country, staffing **BC/BP Residency Trained Emergency Physicians**.

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For more information please visit our website at www.floridaep.com

Susan Yarcheck
Recruitment Coordinator
Florida Emergency Physicians
500 Winderley Place, Suite 115
Maitland, FL 32751
407.875.0555

- Florida Hospital Altamonte
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- Florida Hospital East Orlando
- Florida Hospital Kissimmee
- Florida Hospital Celebration
- Florida Hospital Winter Park
- Florida Hospital Waterman
- Florida Hospital Apopka
- Florida Hospital Zephyrhills
- Florida Hospital for Children
Emergency Department Orlando



Emergency Physicians of Tidewater

Emergency Physicians of Tidewater (EPT) is a democratic group of BC/BP (only) EM physicians serving 7 EDs in the Norfolk/VA Beach area for the past 40+ years. We provide coverage to 5 hospitals and 2 free-standing EDs. Facilities range from a Level 1 Trauma, tertiary care referral center to a rural hospital ED. Members serve as faculty for an EM residency and 2 fellowships. All facilities have EMR, PACS, and we utilize MPs. Great opportunities for involvement in ED Administration, EMS, US, Hyperbarics and medical student education. Very competitive financial package leading to full partnership/profit sharing. Outstanding, affordable coastal area to work, live, and play. Visit www.ept911.com to learn more.

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coast, 74,000 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, phone 800-828-0898 or fax 330-493-8677.

OHIO

Cincinnati: Two New ED's Opening Soon!

New opportunities for BP/BC EM Physicians in Cincinnati. A new hospital will open in the western suburbs with an anticipated ED volume of 60,000 annual visits. Additionally, a freestanding ED is opening in the Hyde Park area with anticipated volume of 18,000 patient visits. Premier Physician Services has a highly appealing model offering equity-ownership at one year with no buy-in; giving you a voice and ownership in your company. Our mid-sized group offers the flexibility and access of independent groups without sacrificing the financial stability of larger groups. Excellent package includes guaranteed rate plus incentives, family medical, employer-funded pension, CME/expense account and more. Contact Kim Rooney (800)726-3627, ext 3674, krooney@premierdocs.com, fax (937) 312-3675.



Wexner
Medical
Center

Columbus: The Ohio State University Wexner Medical Center's Department of Emergency Medicine is offering the following **Fellowship** positions beginning in July 2013: **ACGME Accredited:** EMS, Toxicology. **Non-ACGME Accredited:** Ultrasound, Education, Administration. All fellows will receive appointments at The Ohio State University College of Medicine. Non-ACGME fellows will receive an auxiliary faculty appointment and ACGME fellows will receive a PGY-4 appointment. Fellows must have successfully completed an Emergency Medicine residency program and be eligible to obtain an Ohio medical license. We offer a competitive salary with a full university benefit package. A CME allowance and tuition assistance are also provided. Complete descriptions of all fellowship programs can be found at www.osuem.com. Send CV and cover letter to Mark G. Angelos, MD, Professor and

Interim Chairman, Department of Emergency Medicine, Ohio State University Wexner Medical Center; mary-jaynefortney@osumc.edu; 614-366-8693. AAEOE.

Columbus: Excellent opportunity in 34,000 volume ED. Located 30 minutes south of downtown Columbus, residents have easy access to the amenities of Columbus without sacrificing small town charm. Enjoy the exceptional benefits of working within a regional group with a very appealing model. Premier Physician Services is an equity-ownership where physicians share in both the profits and the decisions. Our mid-sized group offers the flexibility and access of independent groups without sacrificing the financial stability of larger groups. Excellent package offers guaranteed hourly rate plus additional incentive as well as malpractice, family medical plan, employer-funded pension, CME/Expense Account plus equity-ownership at one year with no buy-in! Contact Amy Spegal, (800) 726-3627, ext. 3682, aspegal@premierdocs.com, fax (937) 312-3683.

Dayton: Enjoy the advantage of working within an EM group offering a voice, a financial share, and the opportunity to make a difference in your company. Premier Physician Services offers the stability of a guaranteed package, along with the reward of equity-ownership. Very appealing model offers shareholder status at one year with no buy-in; an excellent package with guaranteed rate, additional incentive, family medical plan, employer-funded pension, malpractice, expense account & additional benefits.

This is a 40,000 volume ED in a north Dayton suburb with 9-hour shifts, collegial environment and an outstanding physical plant. For additional information contact Greg Felder, Premier Physician Services, (800) 726-3627, ext 3670, e-mail gfelders@premierdocs.com, fax CV (937)312-3671.

Springfield: EMP is pleased to announce one of our newest sites – Springfield Regional Medical Center. The area's only full-service hospital, Springfield Regional is situated 45 miles west of Columbus and 25 miles northeast of Dayton, with 75,000 emergency patients treated annually. 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, phone 800-828-0898 or fax 330-493-8677.

Toledo: ED Physician opportunity in suburban Toledo college town. This 26,000 volume ED has excellent coverage including resident and MLP support. It also offers physicians the exceptional benefits of working within a regional group with a very appealing model. Premier Physician Services is an equity-ownership where physicians share in both the profits and the decisions. Our mid-sized group offers the flexibility and access of independent groups without sacrificing the financial stability of larger groups. Premier's excellent package includes guaranteed rate plus RVU & incentives; family medical plan, employer-funded pension, expense account and shareholder status with no buy-in. Contact Amy Spegal, (800) 726-3627, ext 3682, aspegal@premierdocs.com, fax (937) 312-3683.

Toledo: This Level III facility has an annual volume of 42,000 visits with outstanding physician coverage plus PA coverage. Premier Physician Services is seeking an EM Physician sharing our commitment first to quality patient care and excellence. In return we offer superb financial and professional opportunity with the opportunity to participate fully in the decisions and financial rewards of the practice. You'll enjoy the benefits of an outstanding model offering equity-ownership at one year with no buy-in; an excellent package with guaranteed rate and additional incentive. Very appealing benefits include family medical plan, employer-funded pension, malpractice, expense account & additional benefits. Contact Amy Spegal, Premier Physician Services, (800) 726-3627, ext. 3682, e-mail aspegal@premierdocs.com, fax: (937)312-3683.

Urbana: EMP is pleased to announce another of our newest sites – Mercy Memorial Hospital. Servicing the SW Ohio region's residents in Urbana and 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, phone 800-828-0898 or fax 330-493-8677.



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NEW SITE

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NEW SITE

HealthAlliance Hospital, Kingston

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Richmond University Medical Center, Staten Island
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St. Peter's Hospital, Albany

A 440-bed community teaching hospital with 52,000 annual ED visits.

Westchester Medical Center, Valhalla

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NORTH CAROLINA

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Parma: Parma Community General Hospital is situated in the SW Cleveland suburbs. State of the art physical plant and equipment serve 48,000 patients per year. 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, phone 800-828-0898 or fax 330-493-8677.

OKLAHOMA

Tulsa: Modern 971- bed regional tertiary care center sees 84,000 ED patients per year. 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, phone 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. 35,000 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, phone 800-828-0898 or fax 330-493-8677.

Pittsburgh: Allegheny Valley Hospital in Natrona Heights boasts a brand new ED seeing 36,000 emergency pts./yr. Forbes Regional Hospital is a respected facility in Monroeville seeing 48,000 ED pts/yr. Both sites are proximate to Pittsburgh's most desirable residential communities; areas afford easy access to abundant outdoor recreation and nationally ranked schools. 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, phone 800-828-0898 or fax 330-493-8677.

York: Memorial Hospital is host to a respected osteopathic residency program and is situated less than an hour from Harrisburg, PA and Baltimore, MD. Sites has a new ED and sees approximately 40,000 ED pts/yr. Outstanding partnership opportunity includes equal profit sharing, equity ownership, funded pension, open



**Wexner
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Center**

Department of Emergency Medicine
760 Prior Hall
376 West Tenth Avenue
Columbus, OH 43210

The Department of Emergency Medicine at The Ohio State University Wexner Medical Center is seeking physicians for **clinical and academic faculty positions** (rank based on credentials). Teaching opportunities for medical students, residents, fellows and others are abundant as are research and scholarship opportunities. Clinical responsibilities include patient care activity in an Emergency Department (71k annual visits) designated as a Level 1 Trauma Center, Burn Center, Cardiac Center and Stroke Center and/or a Community-based Emergency Department (50k annual visits).

The Ohio State University Wexner Medical Center is one of the largest and most diverse academic medical centers in the country and the only academic medical center in central Ohio. We're internationally known for our superior quality, depth of expertise and leadership in personalized health care. A new Cancer Hospital and Critical Care Tower which includes a new Emergency Department will be completed in 2014 (phase 1) and in 2016 (phase 2). We offer a competitive salary with full university benefits including generous health insurance options, multiple retirement plan options, tuition assistance, group paid malpractice coverage, and CME allowance just to name a few.

Minimum qualifications: MD or DO; successful completion of an Emergency Medicine residency program; Board certified or eligible; Ohio medical license; interest in working in an academic medical center providing clinical care and bedside teaching.

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books, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, phone 800-828-0898 or fax 330-493-8677.

New Castle: EMP is pleased to announce one of our newest sites – Jameson Hospital. This respected facility is situated between Pittsburgh, PA and Youngstown, OH with easy access to the amenities and residential options of each. Recent major renovation includes a 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 Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, phone 800-828-0898 or fax 330-493-8677.

Philadelphia: Emergency Medicine residency-trained physicians are needed for excellent community teaching hospital in Philadelphia. This state-of-the-art department has been completely renovated and has an annual volume of 19,000 patients. Emergency Department has single day-time coverage for 8 hours during the week and 12 hours on the week-ends. Two PAs work in the department with ED physicians to help lessen the clinical load. Bedside ultrasound is available. Position offers competitive compensation package, full benefits, generous CME allowance, pension match, tuition reimbursement and additional pay for working over 128 hours/month. This hospital is in a wonderful location close to arts, entertainment, museums and rich with history. There are many family oriented communities with high ranking schools all within a very reasonable commute. It is a short drive to the mountains, beaches, New York City or Washington D.C. For more information contact Daniel Stern at Daniel Stern & Associates at 800-438-2476 or e-mail stern@danielstern.com.

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, phone 800-828-0898 or fax 330-493-8677.

TEXAS

Multi Area: Quality Emergency Services, PLLC - (QES). QES, in partnership with Altus Healthcare Management Services, is expanding their services to include three Freestanding Emergency Medical Care Facilities in 2013. This creates exciting new career opportunities for ambitious BC/BP Emergency Medicine Graduates and Senior Residents seeking hands-on experience. Candidate must have strong organizational skills, clinically competent skill set, and ability to work independently. Interested individuals will enjoy a flexible schedule, independent contractor status, paid malpractice with tail, and other perks. Begin early and move into medical direction and other leadership opportunities as we grow. The new facilities, in Metropolitan Houston, equipped with a State-of-the Art EHR system and a LEAN approach to work flow, will improve our ability to meet the ever-changing needs of our patients



The University of Texas Health Science Center at San Antonio, School of Medicine. Emergency Medicine, is recruiting for highly qualified full-time residency trained academic Emergency Medicine Physicians. Optimal candidates will have an established track record of peer-reviewed research, excellence in education and outstanding clinical service.

University Hospital, the primary affiliated teaching hospital of the University of Texas Health Science Center at San Antonio, is a 498 bed, Level 1 trauma center which treats 70,000 emergency patients annually. The University Hospital Emergency Department serves as the primary source for uncompensated and indigent care as well as the major regional tertiary referral center with a focus on transplant, neurologic, cardiac, diabetes and cancer care. A new, state of the art Emergency Department with 80 beds will open in early 2014.

The successful candidate will join a young, enthusiastic group of academic Emergency Physicians committed to creating the premiere Emergency Medicine residency program and academic department in the state of Texas. Our initial class of Emergency Medicine residents will start in July 2013. Department status within the School of Medicine is anticipated within 12 months. Academic Emergency Physicians with expertise in EMS, Ultrasound, Toxicology, and multiple dual board certified EM / IM physicians currently round out the faculty.

The University of Texas Health Science Center at San Antonio offers a highly competitive salary, comprehensive insurance package, and generous retirement plan. Academic appointment and salary will be commensurate with experience. Candidates are invited to send their curriculum vitae to: Bruce Adams, M.D., FACEP, Director, Center for Emergency Medicine, 7703 Floyd Curl Drive, MC 7840, San Antonio, TX 78229-3900. Email: adamsb@uthscsa.edu All faculty appointments are designated as security sensitive positions. The University of Texas Health Science Center at San Antonio is an Equal Employment Opportunity / Affirmative Action Employer.

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Charleston: BP/BC EM physician opportunity within EM Residency at three-hospital system with 100,000 annual visits. In addition to Emergency Medicine, there are numerous residencies and student rotations. It also offers physicians the exceptional benefits of working within a regional group with a very appealing model. Premier Physician Services is an equity-ownership where physicians share in both the profits and the decisions. Our mid-sized group offers the flexibility and access of independent groups without sacrificing the financial stability of larger groups. Excellent package includes guaranteed rate plus RVU, incentives; family medical, employer-funded pension, expense account and shareholder status with no buy-in. Charleston offers both metropolitan amenities and easy access to outstanding outdoor recreation. Contact Rachel Klockow, (800) 406-8118, rklockow@premierdocs.com.

Wheeling: Ohio Valley Medical Center is a 250-bed community teaching hospital with a brand new ED under construction. AOA approved Osteopathic EM and EM/IM residency program. Enjoy teaching opportunities, full-specialty back up, active EMS, and two campuses seeing 29,000 and 24,000 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, phone 800-828-0898 or fax 330-493-8677.

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