EM Resident
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Kids' Stuff for Grown Ups

Treating pediatric fever, sepsis, GI blockage and more

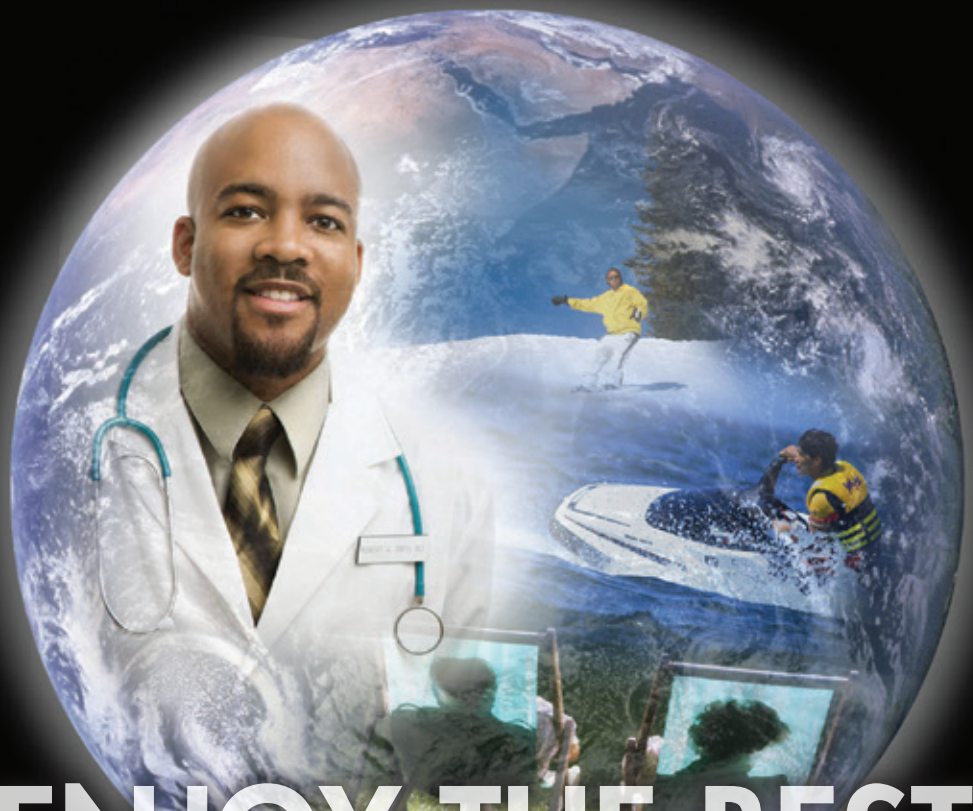
Running the Zone

A playbook for managing your ED and the people in it

Documenting EM

EMRA's filmmakers open up

EMRA



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MANY NAMES ONE VOICE

EM organizations unite to create change

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

Though inherent gaps will always exist between groups when their constituents have varying goals, EMRA members consistently reach across the aisle to bridge the divide.

"Thanks for eyeballing that new patient for me while I was supervising the crazy-tough lumbar puncture on that 400-pound patient."

"No worries. I got your back!"

Conversations like this occur daily in emergency departments across the country, highlighting the unique team-oriented mindset of our specialty's physicians. With so many variables in organized emergency medicine, many ask the question: **As a whole, is our specialty *truly* united?** While each individual emergency medicine organization carries a unique message geared to a particular audience, the recent collaborative efforts between the specialty's game-changers suggest a promising future.

For years, EMRA has worked proudly alongside the **Emergency Medicine Foundation (EMF)** to offer grants to students, residents, and fellows that not only foster careers in emergency care research, but also help to create scientifically rigorous, relevant publications to advance patient care. This year EMF set its eyes on creating a particularly ambitious $1 million endowment – and EMRA raced to the front of the line to help.

Recognizing the importance of sparking the passion for emergency medicine research early in medical school and residency, **our association donated $50,000 to support the foundation**. In conjunction with the American College of Emergency Physicians' (ACEP) pledge matching program, this donation helped to grow the EMF endowment by $100,000. Thanks to the shared mission of so many emergency medicine supporters, EMF surpassed its unprecedented goal.

The **Emergency Medicine Action Fund (EMAF)** provides another stellar example of the emergency medicine community coming together to support its patients. Launched in 2011, the Action Fund is an integral tool for pooling the specialty's resources and campaigning for federal regulatory change. Understanding that health policy advocacy is a top priority for the residents our organization represents, **EMRA made a $50,000 gift to EMAF to help protect our specialty, the safety net, and the patients under our care**. It is vitally important to have a group that is able to mobilize, fund, and act quickly in the dynamic world of health policy on both the state and federal levels. Many other emergency medicine organizations have joined EMRA at the table of the Board of Governors of EMAF to remind legislators that quality medical education is necessary to the health of our nation.

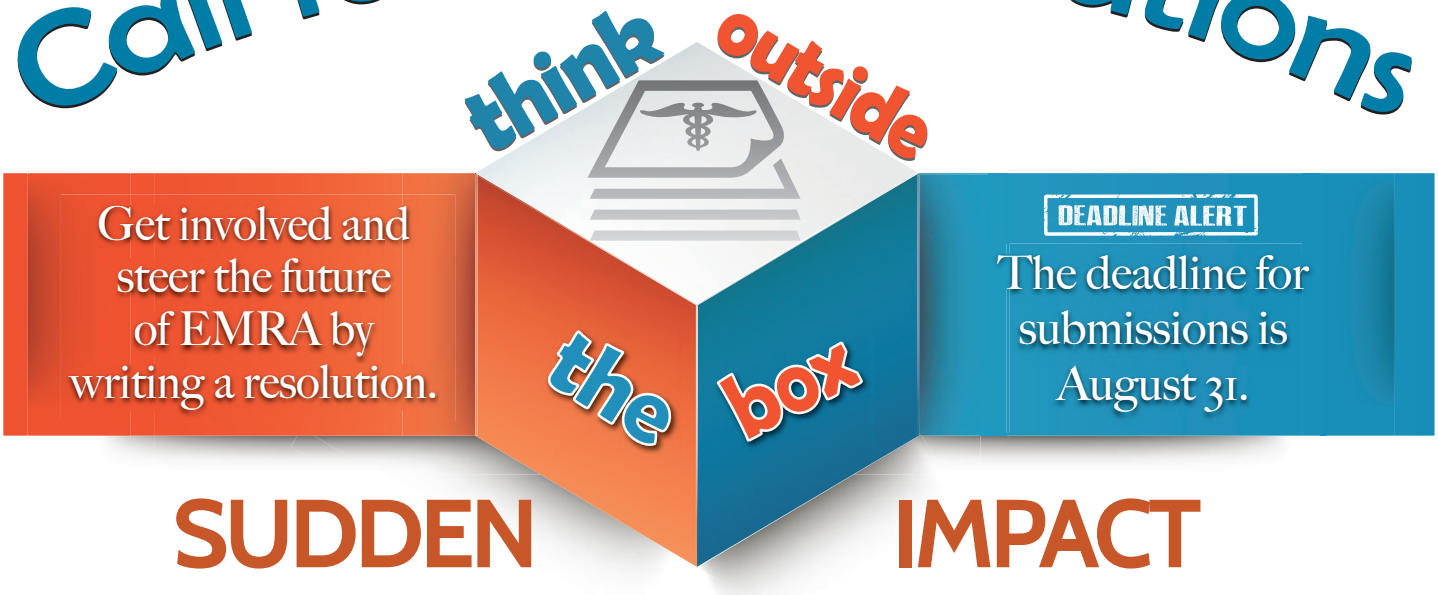
Many collaborative efforts arise through promoting foundations and action funds, but not all. EMRA leadership is invited annually to join the presidents of other major emergency medicine organizations to discuss projects, shared concerns and areas of partnership. While much was discussed this year, **one major area of shared apprehension was the future of graduate medical education (GME) funding.** This is a challenge that will require a unified effort. Thanks to the great minds dedicated to solving this issue, I am confident our specialty will continue to overcome any obstacle that threatens quality care for our patients.

Our shared history truly exemplifies the collective spirit of organized emergency medicine. The greater emergency medicine community has demonstrated a **phenomenal outpouring of support for *24|7|365 – The Evolution of Emergency Medicine*, an EMRA-produced film documentary** that chronicles the development of our specialty through compelling testimonials from our founders and leaders.

Through donations of time, treasure, and talent, countless emergency medicine benefactors have vowed to help preserve our history and inspire current and future generations of physicians. **Our community eagerly awaits the premiere screening event of the world-class, one-hour film, which will be held at ACEP13 *Scientific Assembly* in October.** I invite you to view and share the inspiring film trailer at www.247365doc.com.

Though inherent gaps will always exist between groups when their constituents have varying goals, **EMRA members consistently reach across the aisle to bridge the divide.** If teamwork is an essential part of our everyday jobs, then why shouldn't it be a part of our professional organizations? We are all proud to call ourselves emergency physicians. When we speak with a unified voice, we can't help but be the loudest and most persuasive presence in the room. ✶

Call for Fall Resolutions



Policy approved by our councils directs ACEP and EMRA as organizations and guides our boards in directing our efforts and focus.

Matt Rudy, MD
EMRA Speaker of the Council
Washington University in St. Louis
St. Louis, MO

As your representative council officers, Ije Akunyili and I appreciate the time and effort of our resolution authors, as well as the preparation and participation of our EMRA program representatives, standing committees, and staff! We were thrilled to host spirited discussions on many of the proposed resolutions brought before the EMRA Council during the SAEM Annual Meeting in Atlanta.

Two of our resolutions – written to address **GME funding and the match process, and the use of the title "doctor" in the clinical setting** – were particularly charged. Our council ultimately tasked us with adopting amended resolutions with the direction to submit similar resolutions to be discussed by the ACEP council.

ACEP and EMRA both have representative councils, which serve as our respective policy-making bodies. With EMRA, each residency program appoints a program representative to sit on the council and represent the program's EMRA members. The ACEP Council consists of members representing ACEP's 53 chartered chapters (50 states, Puerto Rico, the District of Columbia, and Government Services), its sections of membership, the Association of Academic Chairs in Emergency Medicine (AACEM), the Council of Emergency Medicine Residency Directors (CORD), the Emergency Medicine Residents' Association (EMRA), and the Society for Academic Emergency Medicine (SAEM). Each year the Council elects members to the ACEP Board of Directors and ensures "grassroots" involvement in the democratic decision-making process.

Policy approved by our councils directs ACEP and EMRA as organizations and guides our boards in directing our efforts and focus. Approved policies are collected in a *policy compendium*, which is available on our website and is reviewed periodically to ensure past policies remain relevant and up to date. Both ACEP and EMRA will meet in Seattle at ACEP13, October 14-17; this will be our opportunity to submit resolutions to ACEP.

Council resolutions can have a true impact. The EMRA *Legacy Initiative*, which started as a council resolution, will culminate with the premiere of a highly anticipated emergency medicine documentary (visit www.247365doc.org for a trailer and more information). The next policy submission deadline is August 31, so **now is the time to start thinking about presenting a resolution for debate**! If you're not sure where to start, Ije and I are here to help. Please email us at speaker@emra.org or vicespeaker@emra.org. We welcome your ideas on how to make our council meetings even better! ✶

Putting Patients and Doctors First

EMRA Representative Council and Leadership and Advocacy Conference updates

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

This past May, emergency medicine physicians came together at two conferences to provide a united front in advocacy for patient care and physician rights. The EMRA Representative Council met at the annual Society for Academic Emergency Medicine (SAEM) meeting in Atlanta to discuss several topics and resolutions supported by EMRA. Included among these topics were the **hot-button issues of GME funding reform and the increasingly confusing term "doctor."** At the annual Leadership and Advocacy Conference in Washington, emergency medicine physicians took to the Hill and lobbied for changes in three separate national legislative acts that would benefit both physicians and patients.

From the EMRA Representative Council Meeting

On GME Funding: This year was the first where there were more U.S. medical school graduates than U.S. residency positions. Physician demand remains high, so the number of annual residency training positions must grow to meet physician supply. Traditionally, residency positions have been supported through government funding; however, it is very unlikely the government will be funding the much-needed increase in resident positions. In fact, GME funding is often on the chopping block as the government searches for ways to decrease spending. The Simpson Bowles Commission recommended a 60% decrease in funding; President Obama's 2014 fiscal budget suggested a 10% decrease.

To counteract this, resident programs already have begun to look for ways outside of government funding to support their residents. Some programs have accepted foreign medical graduates sponsored by their home governments, and other programs have enlisted corporate sponsors. **This outside funding is vital to the education of these residents and the care of their patients.** The Council discussed the importance of at least sustaining the current number of government-funded positions in order to maintain an unbiased match system. A resolution was drafted to that effect.

On the Title "Doctor:" Doctor is not a term that refers only to MDs or DOs. It is also used for dentists, optometrists, chiropractors, PhDs, and now Doctors of Nursing Practice (DNP), also known as nurse practitioners. The American Medical Association developed the "Truth in Advertising" campaign after a survey showed **the average American is uncertain of the types of training health care providers have received**. It can be particularly difficult in the hospital setting, where the patient expects that the person introducing him or herself as "doctor" went to medical school.

When a nurse practitioner introduces him or herself as a doctor, it is therefore likely that the patient will assume that he or she is an MD, not a DNP. In other settings, there is less ambiguity in the term; for example, in a dentist's office, a patient would expect that the dentist he refers to as "doctor" went to dental school, not medical school. The EMRA Council passed a resolution to forward to the ACEP Council restricting the use of the term doctor in the emergency department to *physicians*.

From the Leadership and Advocacy Conference

Health Care Safety Net Enhancement Act of 2013: This legislation provides medical liability coverage to all physicians who provide EMTALA care. This act ensures that these physicians will be treated as federal employees operating under the Public Health Safety Act. Federal employees cannot be personally sued unless they are grossly negligent; the government instead will be liable. This bill hopes to increase the number of on-call specialist physicians that serve the ED.

Protecting Seniors' Access to Medicare Act of 2013: This act repeals the Independent Payment Advisor Board (IPAB). The IPAB is a 15-member board that will be instated if Medicare spending increases by more than the projected per capita Medicare increase for the year. The IPAB must come up with a plan to decrease Medicare spending while covering more patients and preserving the standard of care. The IPAB cannot change the number of tests ordered, so the board only will be able to decrease physician reimbursement. This board will not have any practicing physician members.

Improving Access to Medicare Coverage Act of 2013: Currently, Medicare requires a three-day hospital admission prior to covering a senior's services in a skilled nursing facility. Days stayed in the hospital under the status of observation, however, do not count toward the three-day rule. Seniors often are not aware that they are observation patients and are surprised with large bills once they have entered the nursing home. This bill will require that observation days also count toward the three-day rule.

SAEM and the Leadership and Advocacy Conference are wonderful opportunities to make connections and learn about the health policy issues affecting emergency medicine. These conferences are available to all emergency medicine residents. Consider being an advocate; do your part to put patients and physicians first. ✶

RUNNING the ZONE

EFFECTIVELY MANAGING YOUR ED AND THE PEOPLE IN IT

A PLAY BY PLAY

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New York, NY

Congratulations, Senior Resident! You're on your way to mastering the management of individual patients, from stubbed toes to cardiac arrest. You need to review a few things – as you will for the rest of your career – but you can competently treat almost any patient who presents to you.

Now for the other half of what you need to become a good emergency physician.

Emergency physicians do not treat single patients sequentially; they manage a whole system. **What is optimal at the moment for one *patient* is not always best for the *system*.** And unlike in other specialties, you have no control over how many patients come to your "office" at once – i.e., how big the system gets.

To that end, many programs require you to spend part or all of your final year learning to "run the zone." In smaller EDs, "The Zone" may be the entire department; in larger EDs your playing field may be comprised of different sections. While you cannot run an ED without knowing how to care for each patient individually, managing an entire zone requires a completely different set of skills. This skill set is equally important to patient care, and is one of the strengths that differentiates emergency medicine from all other specialties.

The main goal of managing a zone is to maintain a smooth and efficient flow of patients through the ED while ensuring that emergent issues (hemodynamic instability, threat to an organ or a limb, pain) are addressed before those that are less critical. You are the one looking at the forest while the junior residents deal with the trees.

For example, early goal-directed therapy raises a crashing patient's chance of survival from peri-zero to mediocre. That same patient will have a much better prognosis, however, if someone notices he might go downhill and intervenes before he reaches the precipice. Unfortunately, doing so doesn't provide the same immediate gratification or glory. You'll never know which of the patients you kept stable would have crashed. That doesn't make it any less valuable, as you will realize every time you kick yourself for not seeing a potentially sick patient earlier.

There is no correlation between which residents best manage individual patients and which have a knack for managing a zone. They really are two distinct skill sets, and you should master both while you still have attending backup. If you put enough effort into learning to run the zone as a senior resident, the only major change you will notice when you transition to "attendinghood" will be the bigger numbers on your paycheck.

You will need to:

- ✓ Know which of all of the patients in your zone are sick or may become sick.
- ✓ Be aware of, and address, bottlenecks obstructing patient flow.
- ✓ Constantly update your list of priorities and check that your resources (residents, nurses, your own time, the CT scanner, etc.) are directed toward accomplishing those things first.

See Do's and Don'ts Playbook *on page 8*

Many programs require you to spend part or all of your final year learning to "run the zone."

A DO'S AND DON'TS PLAYBOOK

- **DO "eyeball" patients as soon as they arrive.** (Do not thoroughly evaluate them, but check their vitals, say "hi," put a hand on their belly, look at the rash.) This helps you know who might be sick and allows you to put in orders to expedite care.
- **DO keep track of the next step in each patient's care** (evaluation by a resident, go for CT scan, etc.). This enables you to **notice and address bottlenecks** when something is taking longer than it should. Examples:
  - All the patients under "Nurse B's" care are waiting hours for blood draws because Nurse B has been tied up with one time-consuming patient → Notify the charge nurse so Nurse B receives extra help.
  - A rotating medicine intern has two patients to admit. One of them can be discharged after a post-reduction film, which still hasn't been ordered, but the intern is having a discussion with a medicine resident about which statin a patient should take → Redirect interns by explaining the priorities in the ED.
  - Patients can't be brought in from the waiting room because 16 beds are tied up with telemetry patients who have been waiting to go upstairs for more than a day → Evaluate whether any of those patients can be downgraded to facilitate getting a bed; if so, initiate the process.
- **DO depend on the staffing of junior residents**. You may need to pick up patients whom you can see quickly while you're waiting for junior residents to present to you.
  - At first it may be challenging to focus on your own patients while also hearing your interns' presentations, but this gets easier with practice.
  - It helps to evaluate patients briefly before deciding to take them on yourself. If the cases are complicated, at least you can put in orders; if they are straightforward, you can pick them up without being surprised by how work-intensive they are.
  - Adjust how many patients you see according to your staffing levels. See fewer when you are managing more junior residents and physician assistants.
- **DO actively manage your resources.**
  - Communicate with everyone. If nurses and junior staff understand what needs to happen immediately and what can wait, things will move more smoothly.
  - Assign patients to junior residents if you think they are not seeing enough of them, or if certain patients would be most appropriate for them. Redirect interns when they are spending too much time on something.
- **DO rehearse conversations with junior residents *before* they call consultants.**
  Asking interns what they plan to say to a consultant can be frightening – and enlightening – and will ultimately save you time and repeat calls. Until interns are taught how to communicate clearly, they are inclined to present their patients to consultants the way they presented them to you; they can take *forever* to get to the point.
- **DO ask for help when you are overwhelmed.** If running the zone in a crowded ED feels easy from the start, you aren't trying hard enough. Take advantage of your attendings' years of experience in dealing with the chaos when you feel things are out of control. This is how you learn.
- **DON'T get too consumed with one patient and lose track of the birds-eye view of the zone.** Getting caught up in doing something yourself because you can do it faster or better than the junior resident is a common mistake. You will not be able to manage the zone if you try to do it all yourself. Ultimately, everything progresses most quickly if *you* run the zone, while the juniors struggle a bit to figure out how to dose the antibiotic.
- **DON'T present to the attending before you have seen the patient**. You're not going to learn anything by simply parroting a junior resident's presentation. Also, your impression of a patient's issues, and thus your plan, often will change once you have spoken to the patient yourself.
- **DON'T assume that anything the triage note or junior resident says about a patient is reliable** until you have confirmed it for yourself. It is easy to slip into early diagnostic closure based on the assessments of others who spend less time with patients or have less experience managing cases than you do. In time, you learn how to double-check a patient's information without repeating the entire interview.
  - Correlary: No matter how confident junior residents are, or how much you like them socially, don't automatically assume that they are reliable or capable of performing a particular procedure. It's tedious to do this anew with each resident you supervise, but it saves time and prevents mistakes in the end.
- **DON'T worry if this feels overwhelming at first**. You will improve as the year goes on; interns need much less guidance in May than they did in July. Again, the more you push yourself to practice *now*, the faster you'll reach your comfort level. Seniors who master the skills of running the zone are consistently, and pleasantly, surprised at how smooth the transition to attendinghood can be. ✶

REFLECTIONS *of a* RISING MSIV

Zach Jarou, MSIV
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The darkest year?

A recent article in *Slate* magazine describes the transition from preclinical to clinical medical education as **the "darkest" year of medical school**. It is a year in which the disorientation of rapidly changing clinical environments prevents the formation of lasting relationships, as we shuffle from clerkship to clerkship; a year in which a flurry of emotions goes largely unacknowledged; a year in which the altruistic and empathetic qualities of medical students are threatened with destruction.

Many, but not all, medical students are negatively affected by the unguided plunge into clinical medicine. Some students find great longitudinal mentors which helps with this transition period. Several schools are also now investigating the benefits of integrated, structured curricular for students to digest their experiences and flourish in these transitions.

Finding a mentor

For those of us interested in emergency medicine, there are a number of sources available for finding mentorship. If your school is affiliated with an emergency medicine residency program, don't overlook the core academic faculty. Their considerable experience can help guide you on your way to the residency program of your dreams. You may have met these potential mentors through your emergency medicine interest group (EMIG) or during your home emergency medicine rotation. Even if your school-affiliated program isn't your top pick, don't be shy in seeking advice from these folks on how to land the most competitive position you can.

If you're looking for a mentor who has been in your shoes more recently, **I'd also highly recommend applying to EMRA's Student-Resident Mentorship Program** (www.emra.org/mentorship.aspx). Residents from all walks of life are completing their training in top-notch programs across the country and are eager to share their knowledge and experiences with you.

Building these types of longitudinal relationships can help provide some continuity to your otherwise disjointed medical school experience.

Loving your patients

I have been lucky enough to meet Dr. Patch Adams twice during my medical school career. Both times he greeted me with an enormous hug. For those who aren't aware that he is a real person or only know of him from the popular Robin Williams movie, there's a fantastic video of him on YouTube speaking at the Mayo Clinic that will paint a much more accurate picture of his world view. For those who find the entirety of his ideas too radical to implement in the real world, I hope **the one aspect of his philosophy that we can all embrace is his thrill of loving people**.

Anyone can be taught to take a history, perform a physical, generate a differential diagnosis, or formulate a treatment plan, but it far more difficult to learn how to truly care...to be compassionate. It has been very rewarding to apply my clinical knowledge, but when I look back over the myriad of patients I encountered through my third year of medical school, the most memorable experiences were those in which I was able to make a connection with someone during their time of need. I remember the heartfelt thanks of a woman whose hand I held as a blur of more experienced care providers rushed about to treat her contrast-induced anaphylaxis. I remember the gratitude of a sleepless mother whose crying child finally dozed off as I massaged his aching ear. Moments like these are what I will treasure.

The importance of self-reflection

With all that we are forced to endure as physicians-in-training, **some days it can be difficult to remember why we embarked upon on this difficult journey at all**. My challenge to those of you harboring these thoughts is to reflect upon your own most meaningful patient encounters and **build a library of these memories to help fuel you through these periods of doubt**. While cynicism is an expedient response to our daily challenges and may appear to be the path of least resistance, this attitude is not compatible with a fulfilling career dedicated to serving others. Take the time to acknowledge your emotions and remember what a privilege it is to serve others during their times of greatest need. ✶

Dr. Hunter Doherty "Patch" Adams is famous for his humor and compassionate approach to patient care.

LITTLE SURPRISES IN BIG HAVANA

A Traveling Physician's Experience in Cuba

The striking similarity to the layout of my emergency department in Rhode Island was uncanny. Is it possible that these two countries had barely communicated for over 40 years?

Kimberly Pringle, MD
Brown University
Providence, RI

I jumped out of the 1955 Chevrolet and trekked up the sidewalk to Calixto Garcia Hospital, where I was about to start my three-week elective with an emergency medicine and critical care (EM/CC) specialist in Cuba. **Cuba is recognized internationally for its well-trained physicians and for having developed – with very few resources – one of the best health care systems in the world.** According to the World Health Organization, health care in Cuba costs only $672 per person each year; annual health care costs average $7,164 per person in the U.S.

Despite spending more than 10 times per person annually than Cuba, the United States shares many similar health outcomes with its embargoed neighbor, including life expectancy (79 years) and under-5 and adult mortality rates.[1] Since emergency medicine and critical care in the U.S. require resources such as advanced diagnostic testing and expensive monitoring, I wondered how our specialty would be practiced in Cuba.

I was immediately impressed by the clean, organized, and well-equipped emergency department. Upon entering, a physician triages patients to the internal medicine or surgical clinics, the surgical area, or the intensive care area. Adjacent to the intensive care area lies a radiology department (including a CT scanner), a laboratory that performs basic tests 24/7, and an elevator that opens directly to the second-floor operating suite. The striking similarity to the layout of my emergency department in Rhode Island was uncanny. Is it possible that these two countries had barely communicated for over 40 years?

As I walked through a narrow doorway connecting the surgical and intensive care units, I met my mentor, Dr. Orquidea, who gave me a hug and kiss and simultaneously exclaimed, "*Mija,* I've been waiting for you!"

Eight beds are staffed by two attending physicians certified in critical care and emergency medicine and two critical care nurses. Each bed is equipped with suction and oxygen hookups, as well as electrical sockets for the ventilator and monitor. Within the intensive care area there was an x-ray reading light, a refrigerator for medications, a cabinet filled with bandages and medications (atropine, amiodarone, epinephrine), central line kits, and test tubes. An airway cart and portable ventilator were neatly tucked against the wall. **Again, the organizational preparedness made me feel like I was back at home in the U.S, rather than in the ED of a developing country.**

In 1999 emergency medicine was combined with critical care to create its own specialty in Cuba. Previously, critical care training was confined to a fellowship filled by eligible physicians from internal medicine, family medicine, pediatrics, and anesthesiology. Now that EM/CC has become its own specialty, students may enter after completing two years of social service (during which they complete a family medicine residency), directly from medical school (available to top students only), or after completing another residency. **Each year the government determines the number of residency spots for each specialty, depending on the country's need.** Once trained in EM/CC, these physicians work in the equivalent of adult and pediatric intensive care units, step-down units, emergency departments, and hospital-based critical care ambulances.

Dr. Orquidea practiced medicine with confidence, structure, compassion, and academic curiosity. In one of our first cases together, a hypertensive head bleed, we quickly secured an airway. As we gave Versed, I fumbled with a Mac 4 blade with a loosely fitting dull light, which required special hand placement to dimly illuminate the oropharynx. As I intubated the patient without paralytics or a stylet, Dr. Orquidea coached me with a calm that can only be found with excellent training and years of experience.

Immediately after intubation we drew an ABG and the critical care nurse placed a Foley, which drained into a glass

bottle via IV tubing. We documented the equivalent of a procedure note in the patient's paper chart, which was held together by more IV tubing. The transport team then moved the patient to CT scan; we met the neurosurgeons there to find a large, non-survivable head bleed. We found the patient's family in the waiting room. Because nearly every Cuban attends college and is well-educated, **family discussions were sophisticated and included mutually understood phrases like "metabolic acidosis" and "hypertensive bleed."**

These conversations were common occurrences because EM/CC physicians in Cuba *only* see ICU level-of-care patients. In order to be in the critical care area, patients must be the equivalent of a Level 1 or 1A trauma, have unstable vital signs, or have an abnormal diagnostic test (e.g., STEMI on an EKG) that deems them critical. Pregnant patients with trauma or an active disease process are the exception; they also are seen in the critical care area. With regional "polyclinicas," one family medicine physician per every 120 Cuban families, and the equivalent of small hospitals accessible around the clock, few Cubans – approximately eight to 12 daily – arrived in the critical care area of this hospital, which is considered one of the busiest in the region.

Cuban hospitals are renowned for developing some of the most highly trained physicians in the world.

I found medicine to be practiced diligently, with a few differences in practice such as hyperventilating head bleeds, less access to cardiac catheterization, and different antibiotic choices. Equipment was often well-used but still functional. **Equipment that the hospital was missing (such as nasal cannulas) often could be created from existing hospital supplies** (IV tubing); nothing was wasted. **Cuban physicians have almost no access to updated resources, including the Internet.** Dr. Orquidea identified this as one of the health system's weaknesses. Additionally, she found her income of $23/month to be inadequate for her living expenses, especially with the recent implementation of economic reforms. This low wage did not instill any bitterness toward her job, however; she still loved her work. "*If you practice medicine in Cuba, you do it because you love medicine – not for any other reason,*" she told me. ✶


Equipment in Cuban hospitals is often well-worn but functional.

This motivational banner, located in the grand rounds lecture hall, reads: "The army of white coats marching toward excellence."


Loaded
Capsule
BENZONATATE

Gillian A. Beauchamp, MD
University of Cincinnati
Cincinnati, Ohio

THE DEADLY OVERDOSE RISKS

Typical patient scenario

You are mid-shift on a typically busy day in the ED when your patient with a cough asks for a refill of the Tessalon Perles he has been prescribed by his primary care doctor. Recalling a grand rounds lecture from medical school, you remember Tessalon Perles being mentioned as potentially deadly in pediatric overdose.

"Sir, are there any children in your home?" you ask. He tells you he has two toddler-aged grandchildren who frequently visit. You tell him you would like to research the dangers of this medication, and step out of the room.

Though many think of the drug as a benign antitussive, Tessalon (benzonatate) actually can pose a serious threat in overdose. Any quick ED literature search yields an FDA warning and several case reports on the topic.

The FDA warning, published in December 2010, notes that accidental exposure to benzonatate in children under 10 years of age can result in death from overdose. **Tessalon Perles may be appealing to children because of their appearance: clear gel-filled capsules**. The warning also notes that in children under 2 years of age, exposure to as few as two of these capsules can result in restlessness, tremor, convulsions, coma, and cardiac arrest. One FDA report from 2010 reported that five of seven accidental ingestions in children younger than 10 years of age resulted in death.[1]

Benzonatate, marketed as *Tessalon Perles* and *Zonatuss*, was first approved by the FDA in 1958 as an antitussive to be used in patients over 10 years of age. The medication is provided as a 100- or 200-mg gel-filled capsule and is intended to be swallowed *whole*; it is not to be broken, cut, crushed, chewed, or dissolved.[2]

Benzonatate is a sodium channel-blocker. When taken correctly, it suppresses the propagation of action potentials, which then inhibits nerve impulse transmission in the respiratory tract stretch receptors involved in producing cough. Benzonatate toxicity stems from its ability to create a blockade of sodium channels.[3]

As with other sodium channel-blocking agents, like procaine and tetracaine, **benzonatate can cause QRS widening, tachycardia, dysrhythmias, agitation, seizures, coma, and cardiac arrest**. Accidental ingestions or overdoses can be lethal. Young children are especially at risk because they are more likely to bite or chew the capsule, leading to bolus exposure and potentially fatal laryngospasm, bronchospasm, or cardiotoxicity.[2]

A seven-year retrospective review of all single benzonatate ingestions reported to the National Poison Data System (NPDS) from 2000 to 2006 demonstrated that serious adverse outcomes occurred in 116 of 2,172 patients, including four fatalities. 35% of serious outcomes were seen in children younger than 6 years old. Patient deaths all were due to dysrhythmias, with a median dose of 200 mg (one or two gel tabs) causing those serious outcomes. Adults also are at risk from benzonatate overdose; the medication often is seen in suicide attempts.[4]

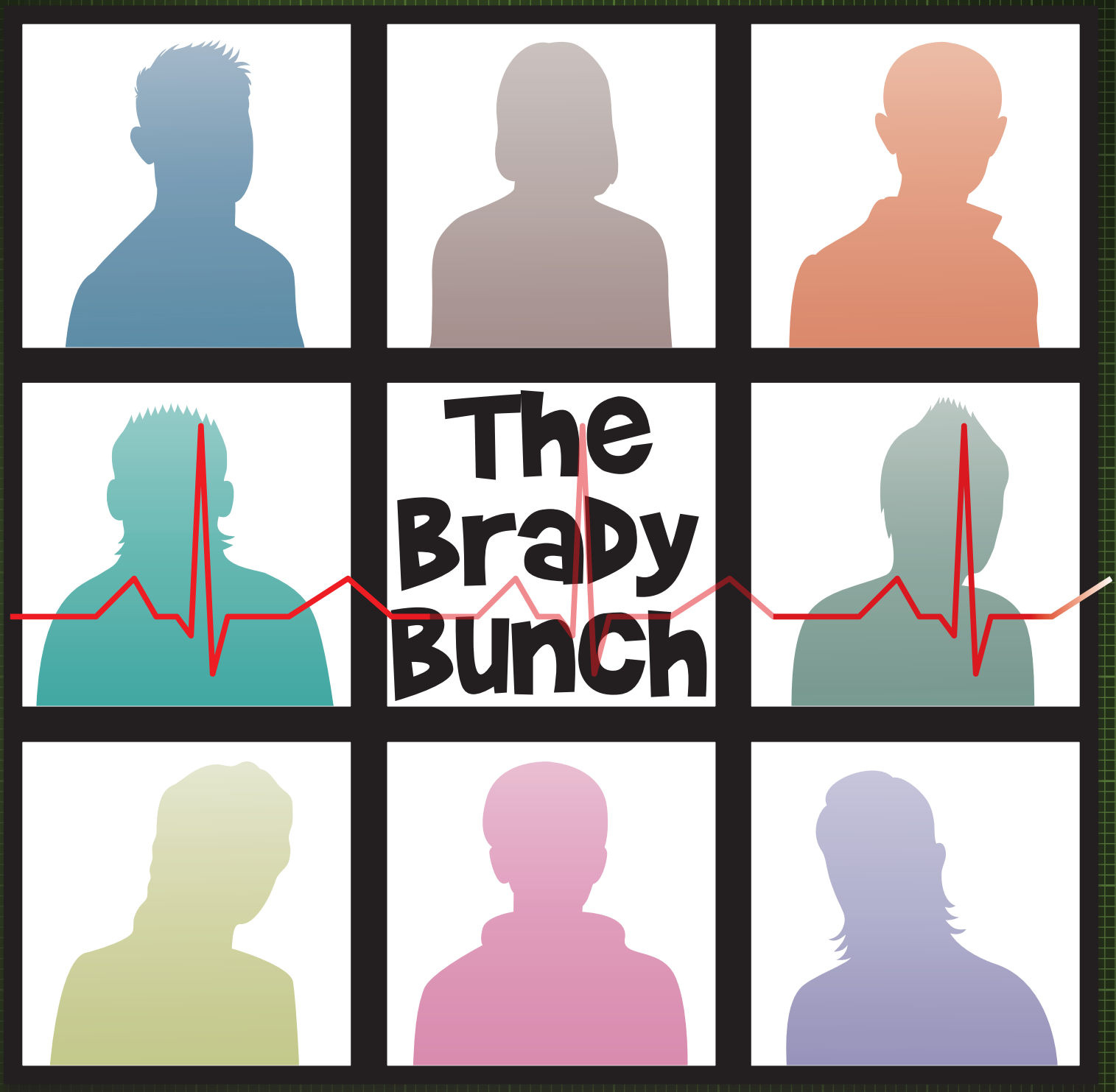
As with the initial assessment of any overdose patient, management begins by establishing a secure airway as needed. Circulatory collapse should be managed according to the *Advanced Cardiovascular Life Support* algorithm, with sodium bicarbonate administered if the patient has a wide QRS on cardiac monitoring or ECG. A lipid emulsion bolus and infusion may be considered for the patient with refractory cardiovascular collapse. The actively seizing patient should be treated with benzodiazepines as first-line agents.[2]

The asymptomatic pediatric patient with exposure to less than 200 mg of benzonatate, or the asymptomatic adult patient who has taken only one extra dose of this medication, may be observed at home. All other patients should be discussed with a local poison control center and referred to an emergency department for management. Asymptomatic patients may be discharged home after an observation period of four to six hours.[2]

Benzonatate is a widely prescribed antitussive with potential to cause great harm in both accidental ingestion by children and in intentional overdose.[5,6,7,8] **Patient education is key to preventing any morbidity and mortality related to pharmaceutical use**. Educating patients about child-resistant packaging and the storage of medications out of the reach of children is essential when prescribing a medication such as benzonatate. While an understanding of the steps in management of benzonatate overdose is important to your practice, exposure prevention has as much potential to prevent adverse events, and may save a child's life.

Case follow-up

You educate the patient that child-resistant containers will need to be utilized and that the medication will need to be kept out of reach of the children at all times. The patient also is educated regarding the symptoms of overdose and is given the number to the local poison control center, which he is told to call immediately with any concerns. The patient thanks you and says, "I've been taking this stuff for years. It works great, but I never knew these little pills could be dangerous for my grandchildren!" ✶



Emergency providers should consider a wide differential when faced with a bradycardic patient.

Bradycardia

Diagnosing and treating it in the ED

Ryan Tansek, MD
George Washington University Hospital
Washington, DC

Miriam Fischer, MD
INOVA Fairfax Hospital
Best Practices, Attending Physician
Fairfax, VA

Many forget that elevated serum potassium can also cause brady- and tachydysrhythmias, heart blocks, and even EKG patterns resembling myocardial infarction.

5 minutes before shift change a 49-year-old female with a past medical history of diabetes mellitus, hypertension, coronary artery disease, and end-stage renal disease (ESRD) on hemodialysis presents to your ED complaining of weakness. The patient also reports several episodes of non-bloody diarrhea. Yesterday's dialysis session was uneventful.

Initial evaluation reveals an ill-appearing woman. She is moaning, her eyes are opening spontaneously, and she is moving all extremities. The family reports this is not her baseline mental status. **Vital signs include a temperature of 35.1°C, heart rate 30-40 bpm, blood pressure 130s/80 mmHg, respirations 20 bpm, and oxygen saturation 100% on room air**. Initial EKG is shown in Figure 1. Her physical exam is unremarkable other than previous coronary artery bypass graft scars, previous amputation of several toes, and an arteriovenous fistula with an appropriate bruit. She is given atropine 0.5mg twice, with minimal effect.

The usual suspects?

After completing your initial evaluation of the patient, you reflect upon the differential diagnosis for bradycardia. You consider rate-controlling medications, including beta-blockers, digoxin, and calcium-channel blockers. The patient's medication list includes carvedilol, losartan, hydralazine, clopidogrel, atorvastatin, insulin, calcium acetate, and aspirin. Family members insist that she could not have overdosed on her medications, and they deny any recent changes to her drug regimen.

You then consider other common causes of bradycardia. Although hypothyroidism can cause sinus bradycardia, this patient has no known history of thyroid problems or stigmata of the disease. There is no sign of increased intracranial pressure, and the patient exhibits no obvious focal neurologic deficits. Sick sinus syndrome or acute myocardial infarction could also cause a sinus bradycardia, but the patient lacks any other symptoms suggestive of this diagnosis. **Importantly, the EKG does not demonstrate signs of infarction, and the patient's initial point-of-care troponin is 0.01µg/L**.

Realizing that the patient's dialysis-dependent status may play a role in today's presentation, you consider another less common cause of bradycardia – *hyperkalemia*. Case reports in both the nephrology and cardiology literature have described hyperkalemia-induced bradycardia.[1-5] Although you have never seen a case of severe bradycardia resulting from hyperkalemia, you're starting to think that this electrolyte imbalance actually may explain your patient's symptoms.

Peaking your interest

After reviewing your patient's EKG, you notice that the T-waves on the cardiac monitor also look a little peaked. You decide to begin emergent treatment for hyperkalemia. Because the patient is unstable, you give calcium chloride intravenously. The patient responds immediately; her heart rate improves into the 60s. The patient's blood pressure also remains stable without further intervention. Her second EKG, taken after the calcium chloride is administered, is shown in Figure 2.

Point-of-care lab work reveals a serum potassium level of 8.6 mEq/L. The patient is further treated for her hyperkalemia in the ED with insulin/glucose, albuterol, and intravenous sodium bicarbonate, and is admitted to the ICU. She remains hemodynamically stable throughout her hospital course. She is dialyzed the night of her admission, transferred to the floor the next morning, and discharged home uneventfully two days later.

continued on page 16

continued from page 15

More than just catching a (T-) wave

The "traditional" EKG changes of hyperkalemia include a prolonged PR interval, wide QRS complex, sine-wave oscillation, and peaking of the T-wave. Although these classic EKG findings are quickly rattled off by most EM residents, **many forget that elevated serum potassium can also cause brady- and tachydysrhythmias, heart blocks**, and even EKG patterns resembling myocardial infarction.[1,6]

The precise mechanism of this bradycardic response to hyperkalemia is unclear. One theory is that an intrinsic "pacemaker" within the heart produces bradycardia in response to elevated or rapidly rising potassium levels within the bloodstream.[2] Certain medications, including calcium-channel blockers, are believed to potentiate this effect.[2] Interestingly, the threshold for dysrhythmias seems to be higher in chronic dialysis patients with elevated baseline potassium levels. **It also has been shown *in vivo* that hyperkalemia-induced bradycardia is resistant to atropine**.[7]

Staying out of trouble

Providers must identify the *cause* of hyperkalemia before they can prevent it. Although patients with end-stage renal disease may require dialysis to remove potassium from the bloodstream, your patient was compliant with her dialysis schedule and had just been dialyzed the day before ED presentation. During this patient's hospital stay, the family reveals that she has eaten a lot of potatoes recently, leading to an abnormally high dietary intake of potassium.

Your patient's diarrhea is also seen commonly in cases of severe hyperkalemia, although it is not clear whether the diarrhea is caused by the electrolyte abnormality or *vice versa*.[8-9] Compliance with diet restrictions, nephrology follow-up, and hemodialysis are all important components of the plan to keep your patient out of trouble in the future. **Seeking early medical evaluation for severe diarrhea, vomiting, or other changes in bowel and bladder habits also could be potentially life-saving**.

Keep an open mind

Emergency providers should consider a wide differential when faced with a bradycardic patient. It is important to consider hyperkalemia in cases of bradycardia refractory to atropine, especially when the patient is known to be at high risk for hyperkalemia. ✶

FIGURE 1. Patient's initial EKG

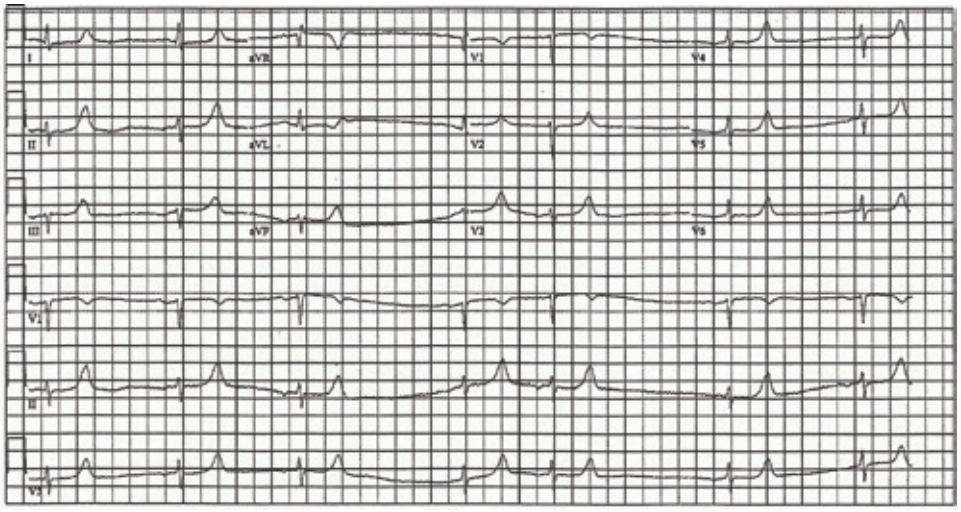
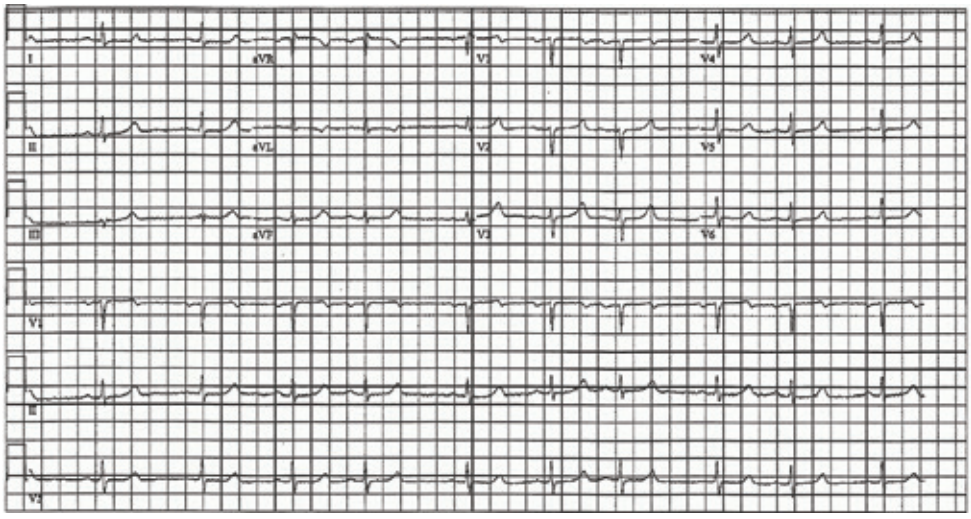


FIGURE 2. Patient's second EKG, following calcium chloride administration



The family reveals that [the patient] has eaten a lot of potatoes recently, leading to an abnormally high dietary intake of potassium.

GRADUATE MEDICAL EDUCATION FUNDING

Careful What You Cut

At the Society of Academic Emergency Medicine (SAEM) meeting in May, the previous RRC representative, Jon Heidt, MD, and the current academic affairs representative, Chadd Kraus, DO, proposed a resolution to protect the current match process.

It's time to talk about an issue at the forefront of emergency medicine – GME funding. If your institution is anything like mine, you NEED more residents. So, before you say, "Tell me something I don't know," let's take a closer look at the facts contributing to our problem.

As of 2012, the United States had approximately 115,000 total physicians in residency programs (not just within the field of emergency medicine). Every year the government contributes around $9.5 billion to help pay for graduate medical education (GME). It is estimated that each resident is federally supported for nearly $100,000/year of training. The Affordable Care Act (ACA) will cut GME funding by approximately 10% over 10 years.

Since 1997 there has been a cap on federally funded GME positions, as well as a steady reduction in support. Although GME funding shortages are not new, these cuts are coming when many institutions are facing rising operational costs; lower insurance reimbursements; and in some states, reduced Medicaid funding. Eventually, the odd-man-out will be us – the residents.

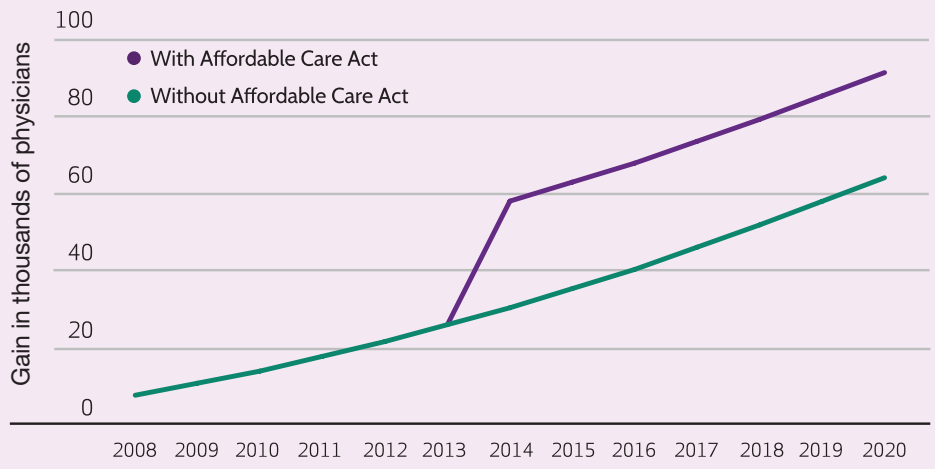
In my home state of Florida, plans are under way to start four new medical schools in the coming years. Many states across the country also are opening new medical schools. Where are all of these medical students going to train? GME-funded positions are already strained to the max. The Association of American Medical Colleges' (AAMC) Center for Workforce Studies has projected a shortage of 90,000 doctors within 10 years. A teaching hospital's GME funding is closely tied to the number of doctors it can train, and so it becomes increasingly difficult to bridge this gap. How would you feel if you had just completed medical school at huge financial and personal cost, but were left with no place to train due to lack of funding?

At the Society of Academic Emergency Medicine (SAEM) meeting in May, the previous RRC representative, Jon Heidt, MD, and the current academic affairs representative, Chadd Kraus, DO, proposed a resolution to protect the current match process. In brief, the resolution protects the integrity and endorses the efforts of institutions to secure GME funding for residents. This resolution will be discussed further in a larger forum this fall at ACEP13 in Seattle. A future article here in *EM Resident* will discuss some creative avenues to accumulate GME funding.

In closing, consider this quote from an opinion paper in the American Medical Association's *American Medical News* online editorial: "Dozens of states and physician specialty organizations already have documented serious doctor shortages that will not get better without a serious upgrade of the physician pipeline that sustains current residency programs and allows new ones to launch. Considering how many years it will take once the needed funding is in place to construct new programs, obtain needed accreditations, and move through the first physician graduates, there is no time to waste." Enough said. ✶

Brandon Allen, MD
EMRA RRC-EM Representative (2013-2014)
University of Florida
Gainesville, FL

EXHIBIT 1. Projected Gap in Number of U.S. Patient Care Physicians, 2008–2020



Source: Darrell G. Kirch, Mackenzie K. Henderson, and Michael J. Dill, "Physician Workforce Projections in an Era of Health Care Reform," *Annual Review of Medicine* (2012) 63:435-45. Epub 2011 Sep 1.

Note: Numbers shown represent gap between projected number of physicians needed and supply.

EMRA EVENTS

ACEP13 Scientific Assembly SEATTLE

SATURDAY, OCTOBER 12

1:00 pm – 5:00 pm EMRA Medical Student Governing Council Meeting (MSGC)

What can YOU help accomplish as a member of this council? Come make a difference. All active and involved medical students are encouraged to attend this meeting.

5:30 pm – 7:30 pm EMRA MSGC/EMIG Representative Mixer (invitation only)

Attend this fun and informal social event that gives you the opportunity to meet with other medical students, the MSGC officers, and EMIG representatives from around the country.

SUNDAY, OCTOBER 13

8:00 am – 2:00 pm EMRA Medical Student Forum & Luncheon

We know that 3rd- and 4th-year medical students have a plethora of questions regarding their transition to an EM residency. EMRA has compiled a panel of distinguished program directors, authors, and EM physicians to help you get those much-needed answers. The medical student networking luncheon is a phenomenal opportunity to mix and mingle with program directors in a more relaxed setting. Directors help answer pressing questions regarding residency years and what to expect.

2:00 pm – 3:00 pm EMRA Residency Fair Exhibitor Registration

3:00 pm – 5:00 pm EMRA Residency Fair

Do you know where you want to match? Attend the EMRA Residency Fair to help you scout out the more than 100 participating EM residency programs from around the country. Medical students cannot afford to miss this terrific opportunity to network with program directors, coordinators, and chief residents.

MONDAY, OCTOBER 14

8:00 am – 9:00 am EMRA Bloody Mary Breakfast

Sponsored by Integrated WealthCare

What better way to kick-start the day than enjoying a hearty breakfast and Bloody Marys or mimosas with fellow residents? Hear what the week has in store for you at this must–attend primer to resident events at ACEP13!

9:00 am – 1:30 pm EMRA Resident Forum and Luncheon

Luncheon sponsored by Mount Sinai School of Medicine

Breaks sponsored by CEP America

Have you acquired all the information and development skills you need to succeed? We have expanded our educational program to help you get there. Residents won't want to miss this forum and networking luncheon.

3:00 pm – 4:30 pm EMRA Representative Council Reference Committee Public Hearing

4:00 pm – 5:00 pm EMRA Job Fair Exhibitor Registration

5:00 pm – 7:00 pm EMRA Job Fair

Co-sponsored by Florida Emergency Physicians and TeamHealth

Looking for that perfect job? EMRA is here to help! All EM job seekers need to attend the largest and best job fair in the specialty of emergency medicine. With more than 150 companies expected to participate in this year's event, you are bound to find the job that is just right for you!

TUESDAY, OCTOBER 15

8:00 am – 12:30 pm EMRA Representative Council Meeting and Town Hall

5:30 pm – 8:00 pm EMRA Legacy Film Premiere

Join us for the premiere screening of EMRA's pivotal documentary film on the evolution of emergency medicine, "24|7|365." The film, part of EMRA's Legacy Initiative, tells the riveting story of our specialty through the eyes of its pioneering founders.

10:00 pm – 2:00 am EMRA Party

Sponsored by Emergency Medical Associates

WEDNESDAY, OCTOBER 16

9:00 am – 11:00 am EMRA Committee Meetings

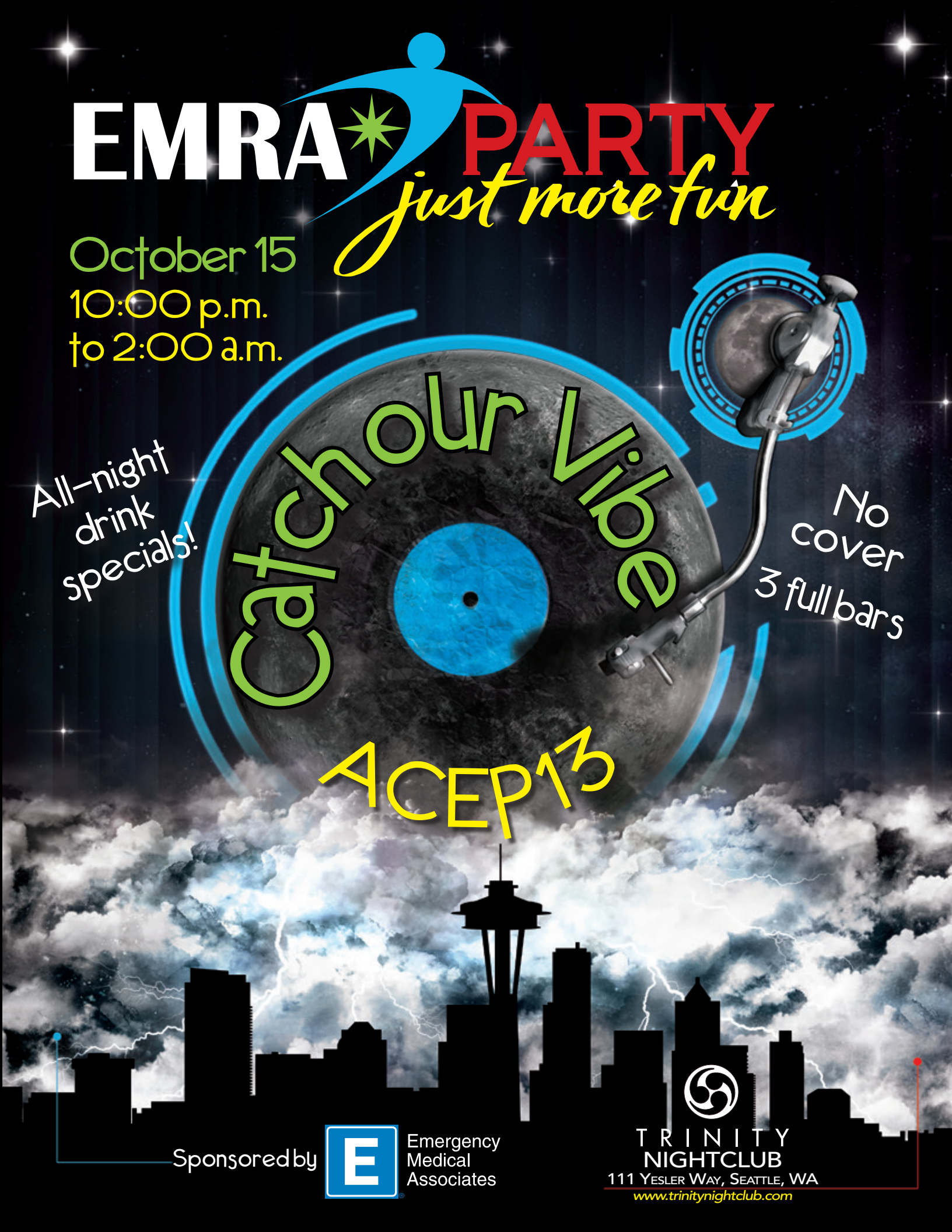
- *Technology Committee*
- *Health Policy Committee*
- *International Health Committee*
- *Critical Care Committee*
- *Research Committee*
- *Education Committee*
- *Wilderness Medicine Committee*
- *EMS Committee*
- *Awards Committee*
- *Ultrasound Committee*

11:30 am – 2:30 pm EMRA Leaders Luncheon/Committee Updates (invitation only)

3:30 pm – 5:00 pm EMRA Fall Awards Reception

5:00 pm – 6:00 pm EMRA Board of Directors Alumni Reception

For 2013 EMRA Job Fair or Residency Fair exhibitor information or sponsorship, please contact Leah Stefanini at lstefanini@emra.org or 866-566-2492.


EMRA
PARTY
just more fun
October 15
10:00 p.m.
to 2:00 a.m.
Catch our Vibe
ACEP13
All-night drink specials!
No cover
3 full bars
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24|7|365

THE EVOLUTION OF EMERGENCY MEDICINE

Nearly one year ago, EMRA brought together two accomplished filmmakers to create the definitive documentary on the history of emergency medicine. The partnership has resulted in the creation of 24|7|365 – *The Evolution of Emergency Medicine*, a film that explores and celebrates the fertile beginnings of the specialty.

The project, which began as EMRA's *Legacy Initiative*, has taken producer Ann Prum and director Dave Thomas on a journey neither one expected. Both describe it as a life-changing experience, which not only has transformed their view of the specialty, but has reinforced their view of humanity and what it means to be a true pioneer.

The filmmakers sat down with EMRA's staff editor, Rachel Donihoo, for this candid interview about their experience.

Documenting Emergency Medicine

"We wanted the film to feel a little like taking a road trip with the voices of EM ...we wanted to create an environment that would cultivate personal reflection."

Director Dave Thomas (left) interviews Dr. Rob Prodinger in Michigan.

EMRA's Filmmakers Open Up

Q Explain how the film project began and how you first became involved.

Ann: I had just completed a fundraising film for the Yale School of Medicine, and I'd gotten to know a lot of the residents who were working in the emergency department. I was approached by Mark Brady [*Legacy* co-chair and executive producer], who was training there. I thought emergency medicine was a cool, visually compelling subject, so I was excited about the prospect of exploring it. Dave's background in advertising and short-form documentaries contrasts to my long-form documentary experience, so it has been an interesting and wonderful match. We have a lot to learn from each other.

Dave: I have a close friend who has written and produced medical dramas, who also happens to be married to an emergency physician. When EMRA approached her husband about finding a director, she suggested they meet with me. The *Legacy* Task Force already had selected Ann and asked me if I'd be interested in working with her. We set a date and met for lunch, and the rest is history. It has been a very refreshing experience. She's incredibly smart and a great storyteller. We view the creative process in a similar way, which has made our partnership a dream for me.

Q When you first set out to make the documentary, what were your goals – what did you want the film to "say" – and did that vision change as the filming progressed?

Dave: One of the questions I asked from a creative standpoint was: what is it that everyone expects emergency medicine to be, and what do they *not* expect it to be? If you really want to engage your audience, you have to deliver something unexpected. If we see a show that begins to unfold in a way we can anticipate, we subconsciously think: Oh, I've already got it. But if the experience is something different – something that makes us really lean forward – we can learn; we're drawn into what we know will be a unique experience.

When we started working on the film, it became immediately clear that we all had a lot to learn and that the subject was something very worthy of study. We wanted to make a film that would be a rich, educational experience for people both inside and outside of emergency medicine. If you're going to take people on a journey, you have to go on a journey yourself – and we really have.

Ann: Dave and I had only a very broad-brush understanding of emergency medicine, but the thing that really resonated with us was how much we're all taking for granted. I've taken my kids to the ED and I've been there myself – most of us have. The fact that it's such a familiar place in so many ways, yet so misunderstood in others, really hit me. We knew it was a compelling place to start a story, and felt like we almost had a *duty* to explore it. Our focus has continued to be the heroes of the specialty – the strong characters who really drove it forward. Their candid interviews really deliver in a way that I think will change viewers' perceptions of these people who care for the public in all hours of the night and in the most desperate of circumstances.

Q What has been the most surprising thing you've learned – about emergency medicine physicians, patients, or the specialty itself – through your interviews with the pioneers?

Dave: There's so much; it has been a real education. Ann has often said that filming a documentary is a little like getting a master's degree in whatever

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field you're filming, My experience with emergency medicine was limited to the few medical dramas I'd worked on, so I had a lot of preconceived notions. When it actually came time for us to film in the ED, I expected it to be chaotic and frenzied. I imagined there would be a lot of shouting and perpetual movement. What impressed me most was, in actuality, how *controlled* things are. Patients and families are frayed and at wit's end; they don't want to be there. Yet, these emergency physicians take the disorder and give it structure. It's like the most elegant team sport imaginable.

Ann: I think the intensity and complexity of emergency medicine took me by surprise, coupled with the emotional drain of it. Even though you assume these doctors and nurses find a way to shut it all off, they don't – not all the time. They absorb a huge amount of emotional stress and are drawn to the specialty because of the level of intensity it provides. They love knowing that they can help people in times of incredible emotional need and that they can connect with people at every level of the social scale.

Q Is there one particularly memorable moment in creating the film that especially moved or resonated with you?

Dave: To have had the opportunity to sit down with the founders who cultivated the idea of emergency medicine – those who watered it, and nurtured it, and transplanted it – has been a true honor. While the whole project has a lot of meaning for me, my experience with Ron Krome will always be something that I remember. He was an interview that I desperately wanted to do, but he had retired long ago and so we had some difficulty locating him. By the time he agreed to talk with us, I already knew a lot about him. I had seen his picture and had heard lots of great stories. He was very representative of what so many of these other physicians had gone through.

When we finally met him at his home in Naples, Florida, I just felt so lucky to be sitting across from him. He was in poor health and was dealing with a lot of pain, but he willingly spent several hours sharing his thoughts and feelings about the history of the specialty with us. He painted an amazing picture of what the beginning was like. He died several weeks after our interview, which crystalized the importance of capturing these irreplaceable voices before they're lost. I'm so incredibly grateful that he was willing to be a part of this project.

Ann: The emotional quality of these physicians' experiences, which they were so willing to expose, really touched me. Oftentimes they're seeing the saddest parts of life; patients enter the ED in the direst of circumstances. Those bad outcomes are hard to shake. Much more than anybody else on the planet, emergency physicians deal with death and dying and catastrophe. Their willingness to share what that is like makes for some of the most powerful moments in the film.

Filmmakers Dave Thomas and Ann Prum interviewed more than 30 emergency medicine physicians in 12 cities for the hour-long documentary.

Q What were some of the challenges you faced in making this film?

Dave: We thought quite a bit about how we could gain the most personal, candid interviews. I felt that it was a challenge that could be overcome only by making the creative choice to take things in an unexpected direction – for the audience and for those we interviewed. We didn't want these doctors to say what they were *supposed* to say; we wanted them to say what they felt. We wanted them to tell history as they experienced it, and not as they thought they *should* have experienced it.

We thought it was important for these men and women to be seen as human beings and not be pre-judged as physicians. We wanted the film to feel a little like taking a road trip with the voices of emergency medicine – the founders, the people who are in mid-career, the residents. We wanted to create an environment that would cultivate personal reflection.

When you see the film, you'll notice that no one was interviewed in scrubs, and many of them were interviewed in their own homes; no one is wearing a stethoscope or an ID tag. The white coat is the mantle of the profession, so without it, a barrier had been removed.

Ann: One of our other biggest challenges was narrowing down the cast of characters. The scope of this project is so big, and there are so many physicians who have made such an enormous contribution to the specialty. There were a lot of wonderful people we just couldn't film, so we had to be very careful when choosing who would be the most representative of the specialty. We filmed more than 30 people in 12 cities, but we knew the documentary itself would be limited to only 60 minutes. It was painful at times to decide what could stay and what had to go. The people we interviewed had such insight; we didn't want to lose *any* of it.

Q What do you hope viewers come away with?

Dave: I really hope that the public enjoys it, of course, but it's especially meaningful to hear the physicians who've seen the rough cut of the film say how much it resonated with them. I think that means we're presenting a rich, layered human experience – one that, much like the specialty itself, is very real and exposed.

We all – the very richest the very poorest – have access to the care these emergency

The film will premiere at ACEP13 Scientific Assembly on October 15. Visit 247365doc.com for more information.

A camera monitor displays an image of Dr. Brian Zink, author of Anyone, Anything, Anytime: A History of Emergency Medicine*, and a member of the project's Advisory Council.*

physicians provide. They deliver care in life's rawest moments. I want viewers to walk away from the film with a sense of what that experience is like – and has been like for the last few decades. I also hope the film reminds people how truly lucky we are to live in a country where we have access to such incredible care.

Ann: Any time you're making a historic documentary, you want people to come away with a clearer understanding of the subject, and this is no different. I want people to realize that the creation of emergency medicine didn't just magically happen. It wasn't created by the government or any bureaucratic agency. A few individual, pioneering doctors simply decided that things needed to change. The birth of the specialty was organic; it came from within. That idea is really inspiring because I think that's really how our country moves forward. The most important changes don't come from the top down, but from the bottom up.

Q How did you get into filmmaking?

Dave: I was a design major in college and then I became a film editor. I didn't set out to be a director, but the path just kind of naturally took me there. I started out in television, but eventually got into network branding and advertising, which came in surprisingly handy when making this film. Advertising requires you to take a broad idea and put a compelling face on it in a matter of seconds. The history of emergency medicine is so deep and complex, but we had only an hour to tell the story. I think my ad experience helped prepare me for that challenge.

Ann: I've always loved wildlife and animals, so I thought I wanted to be a field biologist. I studied environmental science, and shortly after college I met one of Jacques Cousteau's crews at a field site where I was working. I knew instantly that I wanted to make science and nature films, so I began apprenticing with a documentary crew. I've been in the profession ever since – no shortcuts.

Q What are your favorite films? Is there a certain type that appeals to you?

Dave: I love *It's a Wonderful Life*. I carry films with me and I watch them many, many times over; they continue to interest me. The *Band of Brothers* mini-series, which is based on the real-life story of a group of paratroopers in WWII, has become another one of my favorites, and I actually referenced it quite a bit during the filming of 24|7|365. The story of these men – how they bonded through their common "in-the-trenches" experience – makes me think a lot about the evolution of emergency medicine. When we interviewed Mel Herbert for the documentary, he said that you have to *be* in the field to really *get* it. I imagine that's true for any volatile situation in which there's such emotional turmoil. Much like in war, emergency medicine is unpredictable and at times very ugly, but there is a wonderful compassion that runs through the middle of it. When the "soldiers" get to the other side, they're committed to one another for life.

Ann: *Gorillas in the Mist* is one of my all-time favorites, of course! I love documentaries, vérité and immersion films, which allow you to go along with people as they experience something new. I really like any film that makes you think and feel differently than you did before you entered the theater.

Q This partnership between the two of you resulted in the creation of your own company, OneFilms. What direction do you expect it to take you next?

Ann: We're currently filming a three-part *Nature* series for PBS about animal homes, which explores home-life behaviors for everything from birds to beavers to bears. We're also hoping to pursue a documentary-style series on doctors in dire situations. Our experience with 24|7|365 really opened our eyes to medicine and has inspired a whole new realm of possibilities. ✶


GLOBAL
ETHICS

Case Studies in International Medicine

The following is an excerpt from EMRA's new handbook, *International Emergency Medicine: A Guide for Clinicians in Resource-Limited Settings*, edited by Joseph Becker, MD, and Erika Schroeder, MD, MPH. In this chapter on ethical considerations, the authors explore some of the medical dilemmas faced by physicians practicing abroad. Please visit www.emra.org for more information on the book, which covers such topics as pre-departure planning, vaccinations, infection control, field security, malnutrition, and family planning.

The following scenarios are based on real field experiences. They are presented to illustrate the tenents of medical ethics in various clinical scenarios to stimulate reflection and discussion. It is important to remember that many ethical principles are not universally agreed upon and are heavily influenced by cultural constructs of health, human rights, and the rights of the community. Here we provide suggestions about how best to respond (or where to seek help) in each situation, and ultimately preserve the dignity of and respect for the patient, the culture, and the health care team.

Case 1

A medical resident with a personal history of asthma is in his first week of a rotation at a pediatric health post in the Volta region of Ghana. He sees that most pediatric patients who present in respiratory distress are treated only with theophylline; this bothers him, because he is certain that the standard of care should be albuterol and steroid treatment. He also notices that most of the children are not receiving oxygen, and sees one patient who is working particularly hard to breathe. He remembers having packed several metered dose inhalers (MDIs) of albuterol for himself, and considers giving the child several puffs from the vial he is carrying.

This is a complicated case illustrating the principle of *beneficence*: committing an act or deed for the betterment of the patient's situation. In this case, the resident desires to better the health outcome of the child by providing an alternative treatment option that he believes to be superior. However, it is important to understand the context in which the resident is now working. (What is the local standard of care?) Most of the time, these standards are based on the resource availability and care that is culturally acceptable. Introducing new treatment modalities in an ad hoc manner, although seemingly beneficial, may lead to unexpected adverse outcomes – both medically and culturally. One way to address the resident's concern is to first learn what the standard of care is in that community, appreciate when it is appropriate to deviate from the standard, and understand what additional resources are available if a higher level of care is indicated. It would not be appropriate to provide medication that has not been pre-approved.

Case 2

You are volunteering at a regional medical center with scarce resources. There has been news of several patients suffering from deadly snake bites, and the medical director and drug supplier informs you that antivenom is on backorder and is no longer available in the region. You have been shown, however, how to access the stockpile of antivenom reserved only for staff. During your shift, a 14-year-old boy is rushed to the casualty ward by a mob after being bitten in the field by a snake. He is listless with diffuse swelling, purpura, and bullae developing along his right arm. You notice that he is working harder to breathe. As you scan the room for an oxygen tank, the nurse writes a prescription for antivenom, steroids, and antibiotics; she hands it to the mother and says,"You must purchase these drugs from the market before we will be able to treat him." You already know that the prescription cannot be filled, due to lack of supply.

The case presents the issue of *non-malfeasance*: to do no harm. Although there is no *direct* harm being imposed on the child, withholding lifesaving treatment could be argued as such. On the other hand, resource-rationing is not unique to the developing world; it is practiced pervasively across the globe. It is clear in the beginning that there is a systemic shortage of antivenom, although a specified amount has been set aside for health care workers. If this resource were used without the ability to be replenished, health care providers would be at risk – ultimately threatening the availability of medical care in

continued on page 26

continued from page 25

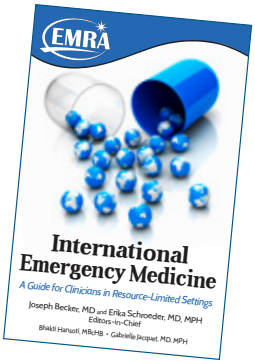
the community. In a setting where providers are limited, preserving their viability is paramount.

There is no easy solution in this scenario. Establishing an open line of communication between the health team members and creating a protocol for treating patients who do not have access to antivenom are essential to providing the best care in this situation. Additionally, it is critical for visiting practitioners to make themselves aware of such local rationing policies and to discuss them with host authorities in order to minimize the risk of being "caught in the middle" of local cultural issues.

Case 3

You are a third-year emergency medicine resident one month into your two-month international elective at a district hospital in Central America. You and two local physicians are covering triage in an emergency ward with over 50 patients still waiting to be seen. You've been told that more foreign doctors are arriving today for a monthlong work assignment. The volume of patients has been a challenge, so you're relieved to hear that more help is on the way. On the other hand, you worry about the time it will take to acclimate the new physicians to the hospital. Just before you call the next patient, two shell-shocked medical students walk in; the senior doctor introduces them as the "doctors who have come from the U.S. to work."

It is important to remember that many ethical principles are not universally agreed upon and are heavily influenced by cultural constructs of health, human rights, and the rights of the community.



This case considers a specific area of international health where supporting academic curiosity may be at odds with supporting local infrastructure and avoiding draining resources. International experiences for medical students who have little clinical and cultural exposure can easily burden an already strained health care system. Accepting that medical personnel be assigned to perform at levels for which they are not trained, simply because the local system is not rigorous in oversight, presents significant ethical considerations. In general, regardless of the local rigor regarding trainee supervision, visiting practitioners should adhere to their home country standards of supervision out of respect for the patients.

Case 4

You are pre-rounding on the patients who are in the medical ward when you come across a 15-year-old boy with diffuse macular rash, bullae, and mucosal damage that you are confident is Stevens Johnson syndrome. You think it is an excellent case study to write up to educate others. You do not speak Swahili and cannot ask the boy directly for permission to discuss his illness. Neither staff nor family are present, so you decide to use your cellphone camera to take several pictures now and discuss your intentions with the family later.

The ethics of *informed consent* should be respected in the international setting, just as it is in the United States. Standards for attaining informed consent, based on a respect for privacy, dignity, and individual self-determination, do not change with geographic or socio-economic setting. Practitioners visiting other cultures should be aware of the age of majority in the culture in which they are working. Additionally, prior to using any recording devices for sounds or images, visitors should make themselves aware of any local cultural injunctions on such. The patient or guardian should have the idea of being photographed explained to him, along with the concept of intended use; he also should be given the option to decline.

Summary

Tamara Thomas, MD, coined the term "ABCs of cultural awareness:" **A**sk for help, **B**alance your views with local cultural views, and show **C**ourtesy to others. As a visitor, your way may not be the most appropriate in the local setting; likely there are alternatives to management that reduce costs and take cultural values and norms into account. Treat colleagues as you would wish to be treated. ✶

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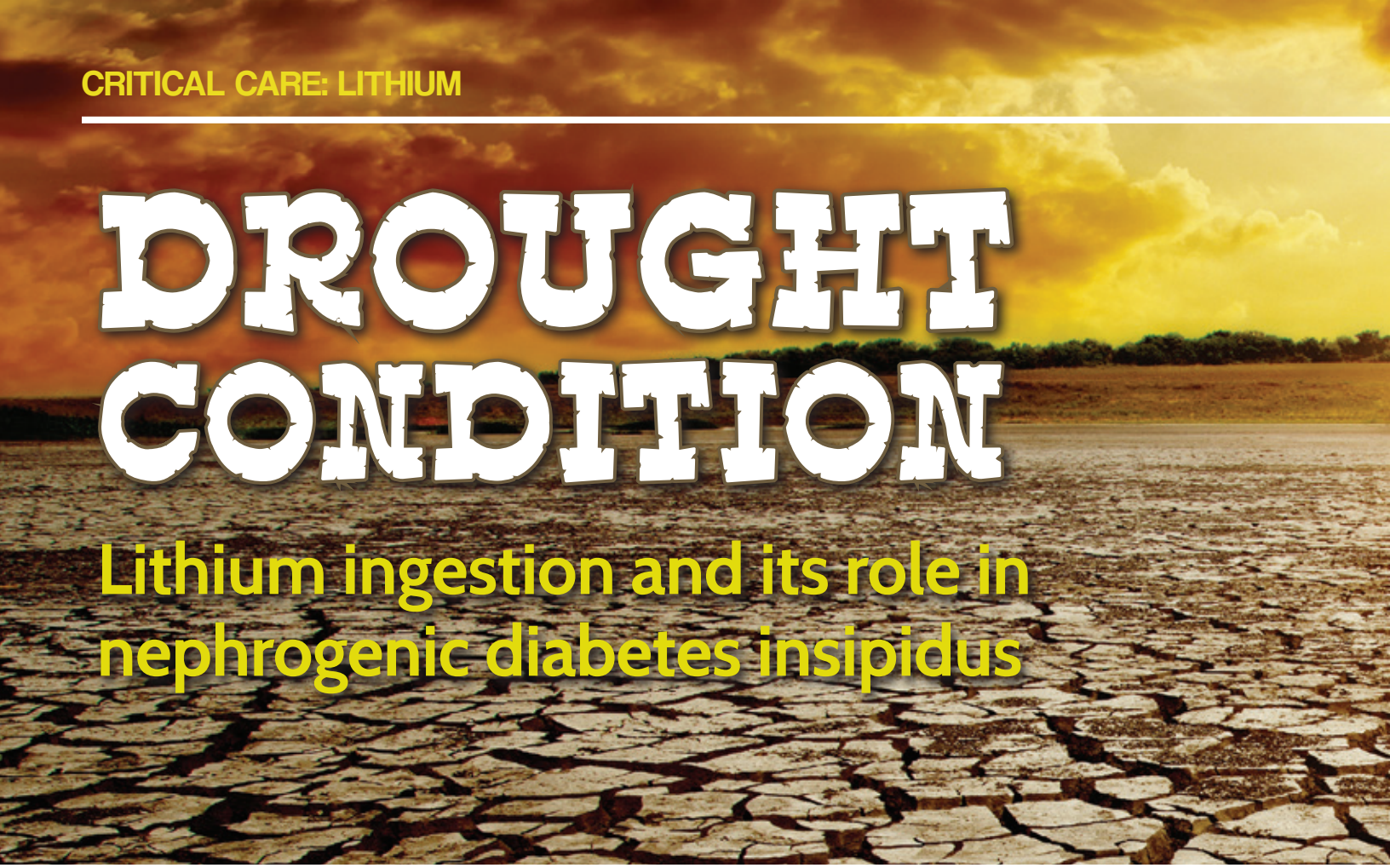

DROUGHT CONDITION

Lithium ingestion and its role in nephrogenic diabetes insipidus

A 36-year-old female with a history of chronic lithium use for bipolar disorder presents to the ED complaining of polyuria for two days. Vital signs are stable, but she appears dehydrated with decreased alertness. Laboratory results reveal a therapeutic lithium level and an elevated sodium level of 170 mEq/L. This is concerning for nephrogenic diabetes insipidus (NDI) secondary to lithium ingestion.

NDI can lead to hypertonic dehydration, seizures, permanent brain damage, and death. It is important that emergency physicians be able to recognize and treat it promptly.

Causes

Diabetes insipidus (DI), either central or nephrogenic, is caused by an inability to conserve water, leading to excessive thirst and voiding of copious hypotonic urine. Central DI (CDI), caused by decreased levels of antidiuretic hormone (ADH), the hormone responsible for increasing water absorption in the kidneys, is more common than NDI. In NDI, normal kidneys are partially or completely resistant to ADH. Common causes of NDI are chronic lithium use, hypokalemia, and hypercalcemia. **The distinction between central and nephrogenic is crucial, as is ruling out primary polydipsia and glucose-induced osmotic diuresis.**[1]

Diagnosis

Polyuria is defined as voiding more than three liters of hypotonic urine in 24 hours. A urine osmolality <200 mOsmol/kg, serum osmolality >300 mOsmol/kg, or serum sodium >146 mEq/L in the presence of polyuria is suggestive of DI.[1] **A water deprivation test can be performed if the distinction between central or nephrogenic DI cannot be made.** The goals of the test are to see if ADH is stimulated by dehydration and if parenteral ADH (or desmopressin) changes urine osmolality.[1]

Mechanism of lithium-induced NDI

Lithium is a first-line treatment for bipolar disorder and severe depression. Lithium can cause nephrogenic side effects even if levels are within therapeutic range and only taken for a few weeks before. **NDI can be seen in up to 40% of patients on lithium.**[2]

The mechanism of NDI results from failure of intracellular aquaporin-2 water channels in the renal-collecting ducts to mobilize to the cellular membrane and absorb free water. ADH increases mobilization of aquaporin-2 water channels in the renal collecting ducts,

TABLE 1. Water Deprivation Test[1]

	After Deprivation	After ADH (Desmopressin)
Normal/ Primary polydipsia	Urine osmolality 2-4 times > plasma osmolality	Urine osmolality increases by less than 5%
CDI	Urine osmolality < plasma osmolality	Urine osmolality increases by more than 50%
NDI	Urine osmolality < plasma osmolality	Urine osmolality increases by less than 50%

Critically ill patients have an inability to increase enteral fluid intake, raising their risk of neurologic complications from hypernatremia.

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TABLE 2. Concentrations of Infusates[5]

Solution	mEq/L of Na^+
D5W	0
0.2% NaCl in D5W	34
0.45% in water	77
LR	130
0.9% in water	154

which leads to reabsorption of free water through the cell membrane. Lithium inhibits ADH's action on these channels, leading to a net free water loss and subsequent dehydration hypernatremia.[3]

In stable patients, dehydration and hypernatremia trigger a thirst response. Critically ill patients, however, have an inability to increase enteral fluid intake, raising their risk of neurologic complications from hypernatremia.[3]

Treatment of lithium-induced NDI

Treatment begins with discontinuation of lithium. Next, emergent correction of hypernatremia requires restoring plasma volume and serum osmolality with hypotonic fluids. Critically ill patients require parenteral hydration with one of the solutions listed in Table 2.

If the patient is hemodynamically unstable, isotonic saline should be given until vital signs improve. Isotonic saline is relatively hypotonic to the plasma tonicity in patients with severe hypernatremia, thus will correct both volume and water deficits.[4]

The fluid infusion rate is derived by dividing the targeted change in serum sodium by the result of **Formula 1**. This allows one to estimate the needed infusion volume for any solution over a given treatment period, and thus calculates the infusion rate.[5]

Formula 1. Estimated Na^+ Change with 1L Infusate

$$\Delta \text{ Serum } Na^+ = \frac{(\text{Infusate } Na^+ - \text{Serum } Na^+)}{(\text{TBW} + 1)}$$

The rate of sodium correction depends upon the rapidity of hypernatremia onset. In general, acute hypernatremia (<24 hours) should be corrected at a rate of 1.0 mEq/L for the first 10-12 hours with near normal correction within 24 hours. Chronic hypernatremia (>24 hours) requires a correction rate of ≤0.5 mEq/L/hour for a total of 10-12 mEq/L/day. Serum electrolytes and neurologic status should be checked every 2-4 hours.[5]

Severe hypernatremia (>160 mEq/L) is an indication for dialysis, still following the above correction rate guidelines. Dialysis is particularly recommended in patients with comorbidities such as congestive heart failure and renal failure because they will not tolerate correctional volume.[6] In addition, lithium is removed with dialysis, so it is particularly beneficial in patients with lithium toxicity.[7]

Adjunctive therapy includes amiloride, thiazide diuretics, indomethacin, and desmopressin. These medications cause either increased water reabsorption or renal sodium excretion. They are more effective when used in combination and in patients who have only partial resistance to ADH.[8-11]

Summary

The first step in treatment of hypernatremia is to detect the underlying cause. Next, correct the hypernatremia according to the duration of the condition, which may require the administration of hypotonic fluids. Consider dialysis, the estimated volume of fluid needed, and comorbid conditions in the treatment of these patients. Remember that amiloride, thiazides, indomethacin, and desmopressin are emergent adjunctive medications for the care of patients with critical NDI. ✶

EKG-guided placement of transvenous pacers

KEEPING PACE

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Transvenous pacing may be the procedure with which emergency medicine residents and physicians are the least familiar.

A 68-year-old woman with a history of hypertension and diabetes presents with a chief complaint of dizziness. The patient's daughter explains that they were in church when the patient began to complain of dizziness and had a near-syncopal event. Triage vital signs are BP 80/50, HR 46, RR 16, O2 sat 95%, and temp 98.1F. The patient is diaphoretic and minimally responsive to verbal stimuli, but protecting her airway. You place two peripheral IVs, start a fluid bolus, and send off labs. Thinking back to ACLS, you place transcutaneous pacing pads on the patient and get a 12-lead EKG. The EKG shows a rate of 44 with type II second-degree AV block.

No problem, right? You start to congratulate yourself on another life saved, while you palpate the patient's radial pulse and look for pacing spikes on the monitor. The patient's blood pressure and heart rate remain low; you slowly increase the output of the pacer without improvement in the patient's hemodynamics. At this point, the patient begins to moan in pain from the shocks. You feel your own heart rate start to increase. The pacer is not capturing and the patient remains hypotensive and altered. Now what?

Other than the elusive ED thoracotomy, **transvenous pacing may be the procedure with which emergency medicine residents and physicians are the least familiar.** It sounds simple enough. We put in central lines and pace patients all the time, but how many ED physicians have actually placed a transvenous pacing catheter?

Indications for placement of a transvenous pacing catheter include:

- Symptomatic bradycardia unresponsive to medication
- High-degree AV block
- Inability to tolerate or failure to capture transcutaneous pacing
- Overdrive pacing

Transvenous pacing is contraindicated after prolonged arrest, in digoxin or other drug toxicity that increases myocardial irritability, and in the presence of hypothermia, as it can trigger dysrhythmias.

Pacing catheters can be placed through a left subclavian or right internal jugular vein, as these approaches provide the most direct route to the heart. **The first step to any invasive procedure is to obtain informed consent and gather equipment**, including:

- Central line bundle, including sterile drape, gown, gloves, etc.
- Ultrasound and probe cover
- Transvenous pacing kit, which includes introducer catheter, balloon tip pacing catheter, sterile alligator clip, and locking mechanism to secure catheter
- Pacemaker generator
- EKG machine and cardiac monitor
- Crash cart and airway supplies

Prep and position the patient as you would to place a central line, using your chosen approach. Prepare the pacing catheter by inserting it through the protective sleeve; make sure the locking mechanisms are in place at the proximal and distal ends of the catheter.

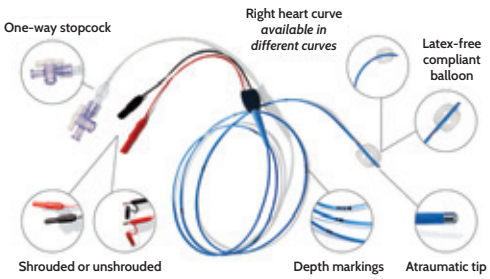

IMAGE 1. Transvenous Equipment
Roberts & Hedges (2010)

Pacing catheters can be placed through a left subclavian or right internal jugular vein.

- Check the kit for the volume of air necessary to fill the balloon and instill this volume of air into the balloon while it is submerged in sterile saline to check for leaks.
- Use standard Seldinger technique to place the introducer catheter.
- Attach the proximal end of the pacing catheter negative terminal to lead V1 of an EKG machine or cardiac monitor using a sterile alligator clip. Then insert the catheter through the introducer, advance approximately 10cm, and inflate the balloon with the specified volume of sterile saline. Close the stopcock on the inflation port.
- Slowly advance the catheter while watching the monitor. While the catheter is in the internal jugular or subclavian vein, the P wave and QRS complexes will both appear small and inverted. When the catheter reaches the SVC, the P wave will increase in amplitude.
- Continue to advance the catheter slowly until the P waves are upright and amplitude of the QRS complex increases; this signifies that the catheter tip has reached the right atrium and is advancing into the right ventricle.
- Deflate the balloon by opening the stopcock and advance the catheter until ST elevations appear; this signifies that the catheter tip is resting against the wall of the right ventricle.

Lock the catheter in place and connect it to the pacemaker generator, paying close attention to the positive and negative terminals. Set the pacemaker to *demand mode* – a rate of 70 beats per minute with the maximum milliamps of output. Slowly decrease the energy until just below the threshold at which pacing stops. Then resume at 2 milliamps above the threshold. While watching the monitor for pacing spikes, palpate the patient's pulse to ensure capture. Obtain a post-procedure chest x-ray and 12-lead EKG, which should show a left bundle branch block with pacing spikes.

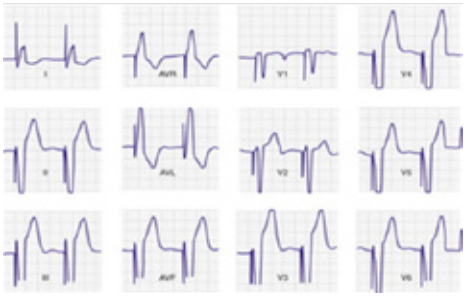

IMAGE 2. 12 Lead ECG after pacer placement
Roberts & Hedges (2010)

Troubleshooting

- As you advance into the right atrium, if the amplitude of the P wave and QRS complex decreases, the catheter has entered the inferior vena cava (IVC). Withdraw and readvance.
- If the P waves become negative after entering the right atrium, the catheter has entered the pulmonary artery. Withdraw and readvance.
- Suspect septal perforation post-procedure if the rhythm changes from LBBB to RBBB, the capture threshold increases, or there is failure to capture.
- Ventricular perforation can cause failure to capture, tamponade, or diaphragmatic pacing.

Back to our case: You successfully place a transvenous catheter in your patient with heart block. Her blood pressure and mental status improve. You breathe a sigh of relief, admit her to the CCU, and move on to your next patient. ✶

Baby BLOCKED

Diagnosing and treating intussusception in the ED

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CLINICAL CASE

A 16-month-old female patient arrives at the ED with a chief complaint of vomiting for four days. According to her parents, the patient had only one wet diaper today, containing urine and diarrhea. She was seen in another ED two days earlier and was given ondansetron. This initially improved oral intake, but the patient has continued to vomit. Upon questioning about possible abdominal pain, the parents describe intermittent episodes of crying lasting only a few minutes at a time. In between these episodes, the patient appears to be pain-free.

This case illustrates the classic presentation of intussusception, the most common cause of gastrointestinal obstruction in children from 3 months to 5 years old. It occurs most commonly in children less than 12 months of age and results from a portion of the small intestine telescoping into itself, causing progressive swelling of the bowel wall. Up to 90% of cases are located in the ileocolic region.

In most cases, the etiology of intussusception is idiopathic; however, it is generally thought to be due to either uncoordinated peristalsis of the gut or lymphoid hyperplasia. Pathologic lead points occur in approximately 4-8% and can be caused by Meckel's diverticulum, polyps, or cystic fibrosis. Intussusception is treated with an air or barium enema to reduce the telescoped portion of intestine. Surgery is indicated for failed enema reduction, peritonitis, perforation, or sepsis.

MYTH BUSTERS

The following are common myths about intussusception that can lead to misdiagnosis or mismanagement.

1 All patients present with the classic triad of colicky abdominal pain, palpable abdominal mass, and currant jelly stools.

Only 20% of patients with intussusception present with the classic triad of symptoms. In a recent study by Mandeville, et al., abdominal pain was the most common complaint in children of all ages at presentation. For children less than 12 months of age, there is a higher incidence of irritability, lethargy, and bilious emesis.

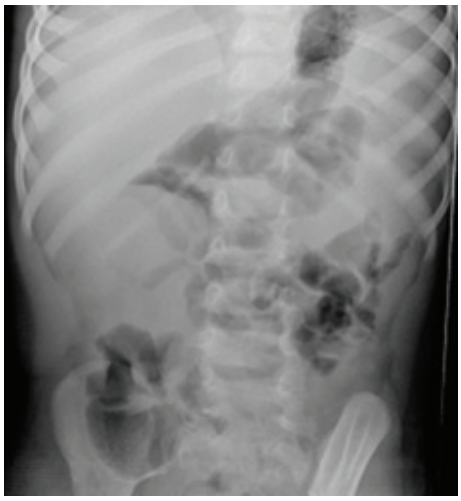


FIGURE 1. Left lateral decubitus x-ray indicating paucity of air in the ascending colon.

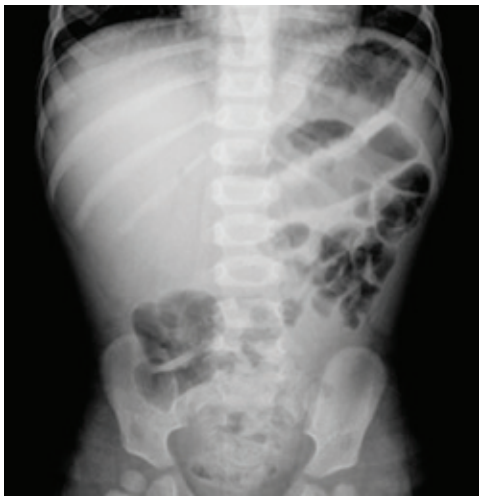
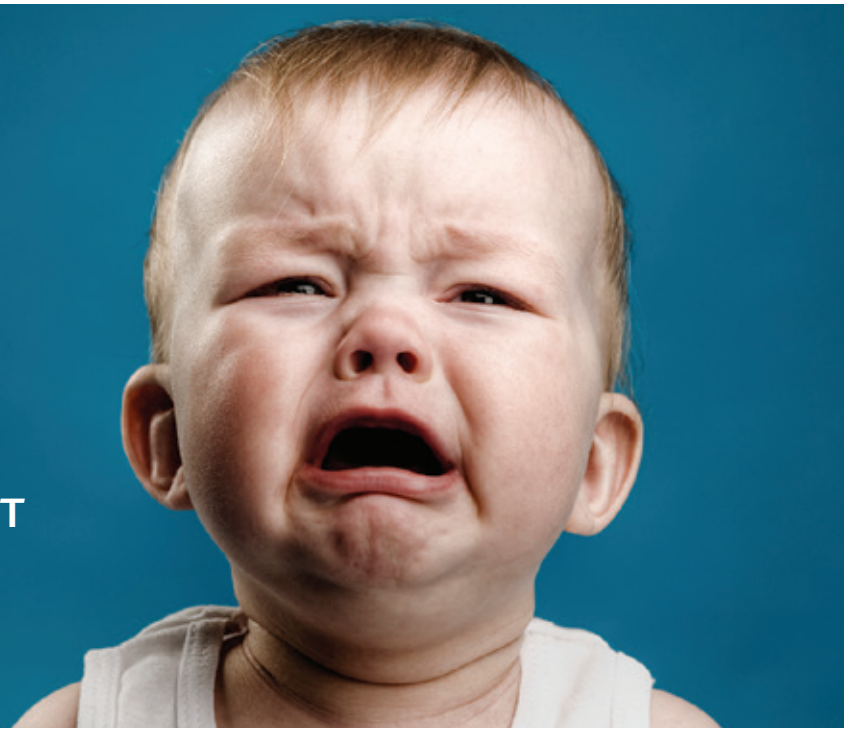


FIGURE 2. Supine abdominal x-ray indicating paucity of air in the ascending colon.

INTUSSUSCEPTION IS THE MOST COMMON CAUSE OF GASTROINTESTINAL OBSTRUCTION IN CHILDREN FROM 3 MONTHS TO 5 YEARS OLD...BUT ONLY 20% OF PATIENTS WITH INTUSSUSCEPTION PRESENT WITH THE CLASSIC TRIAD OF SYMPTOMS.



2 All patients need a screening ultrasound to exclude intussusception.

In a recent retrospective review by Roskind, et al., air in the ascending colon in supine, prone, and left lateral decubitus abdominal radiographs can exclude intussusception when clinical suspension is low. However, abdominal ultrasound has a sensitivity of 98-100% and a specificity of 88-100%, but may be limited by sonographer experience. Ultrasound can be used for diagnosis to decrease radiation exposure and enema discomfort. If there is a high index of suspicion and the ultrasound is negative, an air enema may be used for diagnosis and treatment.

3 All patients must be admitted post reduction for 24-48 hours of observation.

Observation in the ED for a six-hour period may be a safe alternative to inpatient management. Recurrence rate for intussusception is approximately 10%. In a recent study by Chein, et al., there was an early recurrence rate of 2% within the first six hours post reduction, but most occurred later than 48 hours. Prior to discharge, patients must have a normal physical examination, tolerate oral feeds, and have means to return to the emergency department.

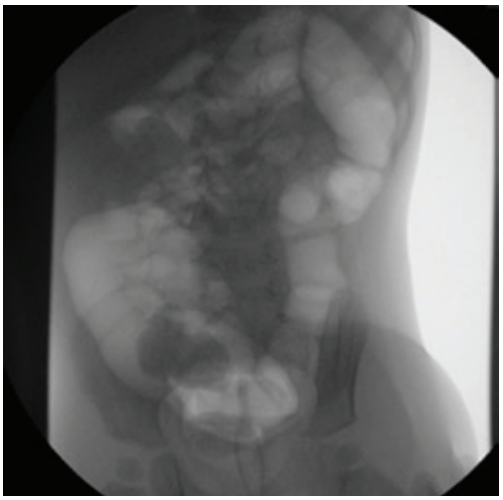


FIGURE 3. Air enema prior to reduction.

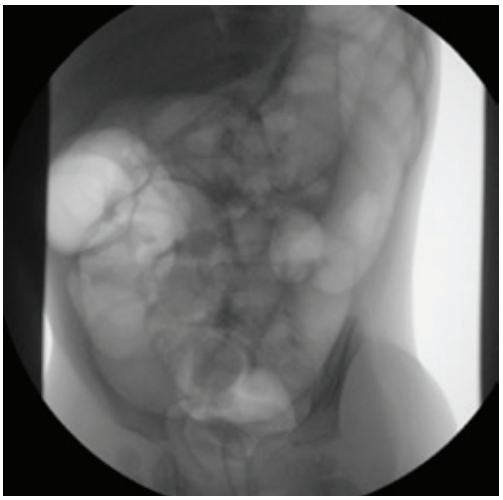


FIGURE 4. Air enema after reduction of intussusception.

RETURN TO THE CASE

Initially, a KUB and left lateral decubitus x-ray was performed, indicating the absence of air in the ascending colon (Figures 1 and 2). An abdominal ultrasound was then performed, showing the classic "target" sign for intussusception.

Finally, an air enema was performed, which successfully reduced the intussusception (Figures 3 and 4). The patient was released 24 hours later with no complications. ✶

PLAYING IT COOL

Understanding and treating pediatric fever

While most emergency medicine residents complete training with a good idea of how to approach a sick adult, that confidence doesn't always extend to younger patients. Kids can be intimidating. The vast majority of children seen in emergency departments are, for the most part, well. A significant portion of these healthy children present with fevers caused by banal viral infections, but a fever can sometimes point to something much more insidious. Here we present two articles that focus on how to detect when a febrile child truly is in danger and what to do about it. With a little knowledge, you'll be able to turn that "scary" child back into the lovable kid he really is.

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When warming is a warning

INFANT AND NEONATAL FEVER

Although fever is a common finding in the ED, it can also be a sign of serious infection in pediatric patients.

Background

Fever (rectal temperature >38.0°C) accounts for approximately 10-20% of all pediatric ED visits.[1-3] Although fever is a common ED finding, it can be a sign of serious infection.

Approximately 40% of ED patients 3 months old with a temperature ≥40.0° C will have a bacterial infection.[4] Moreover, the incidence of serious bacterial infection (SBI) in febrile neonates (infants <28 days old) has been reported to be 10-15%.[5] Identifying the cause of pediatric fever and implementing appropriate antibiotic coverage is crucial.

As antibiotic complications and hospitalization come under increased scrutiny, many clinicians are reconsidering traditional strategies for the emergency management of febrile neonates. Several clinical guidelines have been proposed to risk-stratify these patients, including the Philadelphia, Rochester, and Boston criteria for patients <90 days old.[6-8] Nevertheless, **ED management of febrile children remains an area of great controversy**. Providers must balance the morbidity and mortality associated with SBIs in infants and the potential adverse effects of empiric antimicrobial therapy.[9-10]

Initial evaluation

Like with any ED patient, the diagnostic evaluation of fever in children less than 3 months old begins with a thorough history and physical examination. Critical information includes the perinatal period (birth history and complications), maternal risk factors for infection (fever, leukocytosis, *group B streptococcus* [GBS] status) and immunization history. **A careful history must include specific vaccinations the child has received; simply asking if the infant is "up-to-date" is insufficient.**

In some cases, the parent might report a fever at home, though the patient is afebrile in the ED. This information should not be dismissed. The absence of fever does not necessarily exclude sepsis, and parental reports of fever are remarkably accurate when measured with a thermometer.[11] A thorough history of the patient's fever includes how the temperature was measured and whether antipyretics were given. The physician also should solicit information regarding recent feeding habits, urine output, and the patient's level of alertness.

Laboratory and ancillary testing

The American College of Emergency Physicians (ACEP) clinical policy on pediatric fever is summarized in **Figure 1**.[3] Most authors recommend obtaining basic laboratory studies, including a complete blood count, electrolyte panel, urinalysis with microscopic and culture analysis, blood cultures, and lumbar puncture. Chest x-rays only should be ordered in children <3 months if they have fever with one of the following signs of pulmonary disease: tachypnea >50 breaths per minute, rales, rhonchi, retractions, wheezing, coryza, grunting, stridor, nasal flaring, or cough.[3] More recently, serum markers such as

continued on page 36

The absence of fever does not necessarily exclude sepsis, and parental reports of fever are remarkably accurate when measured with a thermometer.

continued from page 35

C-reactive protein and procalcitonin have been evaluated for the identification of pediatric patients with fever and no apparent source.[12]

Common pathogens

Neonatal fever can be caused by self-limited viral infections. However, SBI can be deadly and must be excluded as the source of any pediatric fever. In the first week of life, fever can be caused by vertical transmission of maternal infections or other perinatal exposures. After the first week of life, febrile illnesses are most commonly caused by health care-related or community-acquired pathogens. In the first month of life, GBS, *H. influenzae*, *Staph aureus*, *Listeria monocytogenes*, HSV, *E coli*, or other gram-negatives should be considered. Urinary tract infections are a common etiology of sepsis in neonates. Meningitis is also a common cause of fever in the first month of life. It is found in up to 10% of neonates with infection due to GBS.[13]

Treatment

Airway, breathing, and circulation are your first priorities in the evaluation of the febrile neonate. Once stabilized, providers should search for a source of infection. **Empiric antibiotics should be administered as soon as sepsis is diagnosed.** Unfortunately, neonatal sepsis is "based on a constellation of perinatal risk factors that are neither sensitive nor specific," thereby necessitating the use of broad-spectrum antibiotics.[14]

Empiric treatment for neonates includes ampicillin, gentamicin, and potentially a third-generation cephalosporin (e.g., cefotaxime) while awaiting culture results. Vancomycin can also be used. Ceftriaxone must be avoided in neonates, as it displaces bilirubin and can precipitate kernicterus.

Ampicillin and cefotaxime are recommended for infants aged 29 to 60 days, while cefotaxime or ceftriaxone are recommended in those greater than 60 days old. Once the pathogen is identified, antibiotic coverage should be narrowed as much as possible.[14]

Disposition

Most authors suggest that all febrile children <28 days old should be admitted for additional evaluation and monitoring. In children >28 days old but <90 days old, it is possible to complete the fever work-up in the ED. These patients can be discharged home only if close follow-up can be ensured. ✶

FIGURE 1. ACEP Clinical Policy – Pediatric Fever[3]

TOPIC	RECOMMENDATION	LEVEL OF EVIDENCE
Risk of bacterial infection	Infants between 1 and 28 days old with a fever should be presumed to have a serious bacterial infection.	A
Response to antipyretics	A response to antipyretic medication does not change the likelihood of a child having serious bacterial infection and should not be used for clinical decision-making.	A
Chest radiograph (CXR)	A chest radiograph should be obtained in febrile children younger than 3 months with evidence of acute respiratory illness.	B
Urinary tract infection (UTI)	Children younger than 1 year with fever without a source should be considered at risk for UTI.	A
Best method for obtaining urine	Urethral catherterization or suprapubic aspiration are the best methods for diagnosing UTI.	B
Role of urinalysis, microscopy, and culture	Obtain culture and other urine studies in children <2 years because negative urine dipstick or urinalysis does not exclude UTI.	B

Pediatric Sepsis

Adherence to current guidelines and "golden hour" resuscitation goals, along with proper antibiotic administration, are key management actions.

New evaluation and management guidelines

Melvin Ku MD, MS
EM Resident Physician
SUNY Upstate
Syracuse, NY

Introduction

Despite the large number of healthy children with fever in the ED, pediatric fever can be a marker of serious bacterial infection or severe sepsis. Treatment of these critically ill patients begins in the emergency department. As emergency physicians, we have the opportunity to greatly impact care of the septic child, as the in-hospital mortality rate for pediatric patients with severe sepsis is 4%.[1]

New guidelines

The recently released "*Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock: 2012*" reflects the most recent advances in sepsis care and should serve as our go-to resource on the topic.[2] Since the earlier 2008 protocol was released, numerous research articles have allowed sepsis guidelines to be updated for the pediatric population.

Definitions See Table 1 (Adapted from Goldstein, et al. *Pediatr Crit Care Med* 2005; 6:2-8.)[3]

UPDATES IN INITIAL RESUSCITATION AND INFECTION ISSUES

"Golden Hour" goals

Resuscitation goals to be achieved within the first hour in pediatric patients with septic shock remain unchanged[2]:

- Capillary refill ≤2 seconds
- Normal blood pressure for age
- Normal pulses with no differential between central and peripheral pulses
- Warm extremities
- UOP >1 mL/kg/hr
- Normal mental status

Initial resuscitation

Ventilation, oxygenation, and vascular access are fundamental management points for your pediatric patient. The 2012 guidelines suggest correcting respiratory distress and hypoxemia via direct oxygen delivery through face mask, high-flow nasal cannula, or nasopharyngeal CPAP.

The new guidelines also suggest that IV/IO access can be used to administer peripheral inotropes (but not vasopressors) while a central line is established.[4] Despite concerns for peripheral vascular and tissue injury, studies show that **withholding or inadequately dosing inotropes leads to a significant increase in mortality**.[5]

In patients with refractory shock, there are new recommendations to strongly consider and reverse pneumothoraces, pericardial tamponade, or endocrine emergencies (e.g., hypoadrenalism, hypothyroidism).

Use of the American College of Critical Care Medicine – Pediatric Advanced Life Support (ACCM-PALS) guidelines continues to be strongly recommended in managing septic shock. (Figure 1) Adherence to the guidelines resulted in a significant survival rate of 92% for pediatric patients in septic shock, versus only 62% receiving non-adherent care.[6]

Diagnosis/antibiotics

Consistent with prior guidelines, empiric antimicrobials should be administered within one hour of recognizing severe sepsis. Blood cultures should be obtained beforehand, but should not delay initiation of antibiotics.

The latest guidelines suggest using clindamycin for suspected toxic shock syndromes, with consideration of IVIG if pediatric patients have refractory

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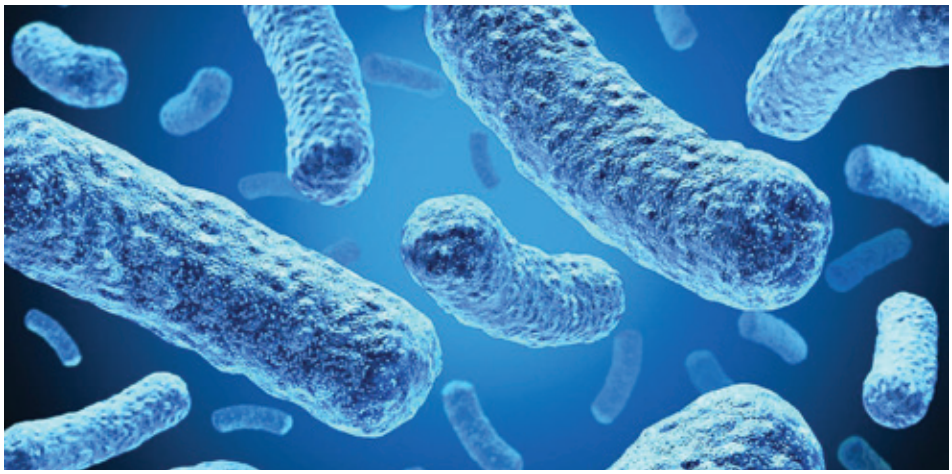

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hypotension. Lastly, aggressive and early infection source control is strongly recommended.

UPDATES IN HEMODYNAMIC SUPPORT AND ADJUNCTIVE THERAPIES

After striving to meet the resuscitation goals aforementioned, suggested stabilization goals include a $ScvO_2$ ≥70% and a cardiac index of 3.3-6.0 L/min/m^2. The 2008 de Oliviera study found that while all septic shock patients adhered to ACCM-PALS guidelines, continuous $ScvO_2$ monitoring in the intervention group ($ScvO_2$ goal ≥70%) resulted in more blood transfusions, inotropes, and fluid resuscitation. The intervention group had a 28-day mortality rate of 12%, versus 41% in the control group (NNT=3.6).[8]

Fluids

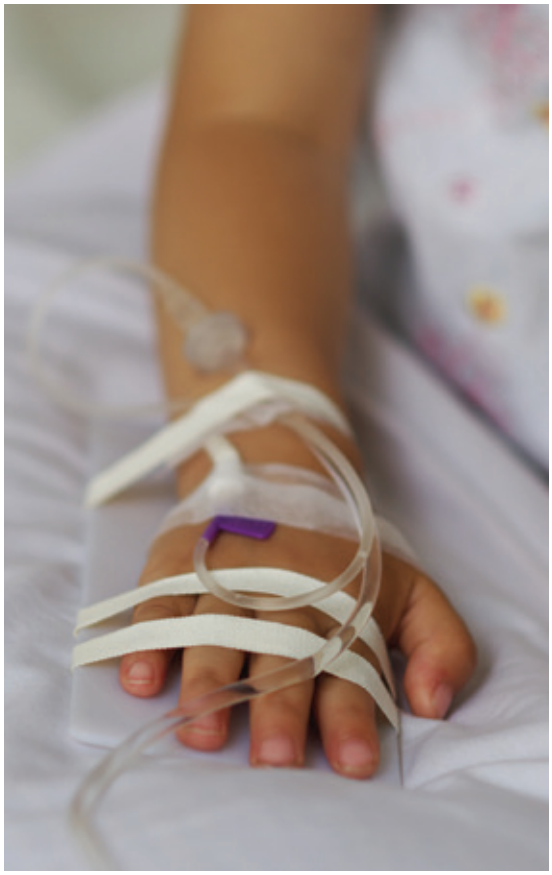
Current guidelines for fluid resuscitation remain unchanged. For septic pediatric patients in hypovolemic shock, boluses of crystalloids (or albumin equivalent) up to 20 cc/kg should be given over 5-10 minutes. These should be titrated to reverse hypotension and increase UOP, while normalizing capillary refill, peripheral pulses, and level of consciousness. The few studies comparing colloids versus crystalloids show no significant difference in mortality.[9]

While initial volume repletion can require 40-60 cc/kg or more, new-onset hepatomegaly or rales indicate hypervolemia and should prompt fluid cessation and consideration of inotropes.

Inotropes/vasopressors/vasodilators

Prior guidelines suggested dopamine as the initial choice of support for pediatric patients with hypotension refractory to fluid resuscitation. Current guidelines specify utilizing vasopressors and inotropes to maintain cardiac output based on the patient's hemodynamic state. Specific vasopressors for fluid-refractory septic shock include:[10]

- Normotensive shock (impaired perfusion with adequate blood pressure): dopamine
- "Warm" shock (vasodilated with poor perfusion or hypotension): norepinephrine
- "Cold" shock (vasoconstricted with poor perfusion or hypotension): epinephrine



Steroids

Steroids were only suggested in previous guidelines, but now there are strong recommendations to provide timely hydrocortisone therapy in pediatric patients

TABLE 1. Definitions

SEPSIS	SEVERE SEPSIS	SEPTIC SHOCK
SIRS criteria (need ≥2 of 4 AND either abnormal temp or white count required) 1. Core temperature >38.5°C or <36 °C 2. Age-specific tachycardia or bradycardia <10th percentile for age <1 year 3. Mean respiratory rate> 2 SD above normal 4. Leukocyte count elevated or depressed, or >10% bands ***AND*** presence of documented or probable infection	Sepsis ***AND*** *one of the following:* cardiovascular-organ dysfunction ***OR*** acute respiratory distress syndrome ***OR*** Two of the following: 1. GCS ≤11, or GCS ≥3 loss from baseline 2. Platelets <80,000/mm³ or >50% decrease from baseline 3. Creatinine >2x upper normal limit/ baseline 4. Total bilirubin >4 mg/dL, or ALT >2x upper normal limit	Sepsis ***AND*** Cardiovascular-organ dysfunction *defined as*: Hypotension<5th percentile for age or systolic BP <2 SD below normal for age ***OR*** Need for vasoactive drugs to maintain blood pressure ***OR*** Two of the following: 1. Unexplained metabolic acidosis: base deficit>5.0 mEq/L 2. Arterial lactate >2x upper normal limit 3. UOP <0.5 mL/kg/hr 4. Capillary refill >5 secs 5. Core to peripheral temperature gap >3°C ***DESPITE*** administration of isotonic IV bolus≥40 mL/kg in 1 hr

(Adapted from Goldstein, et al. Pediatr Crit Care Med 2005; 6:2-8.)[3]

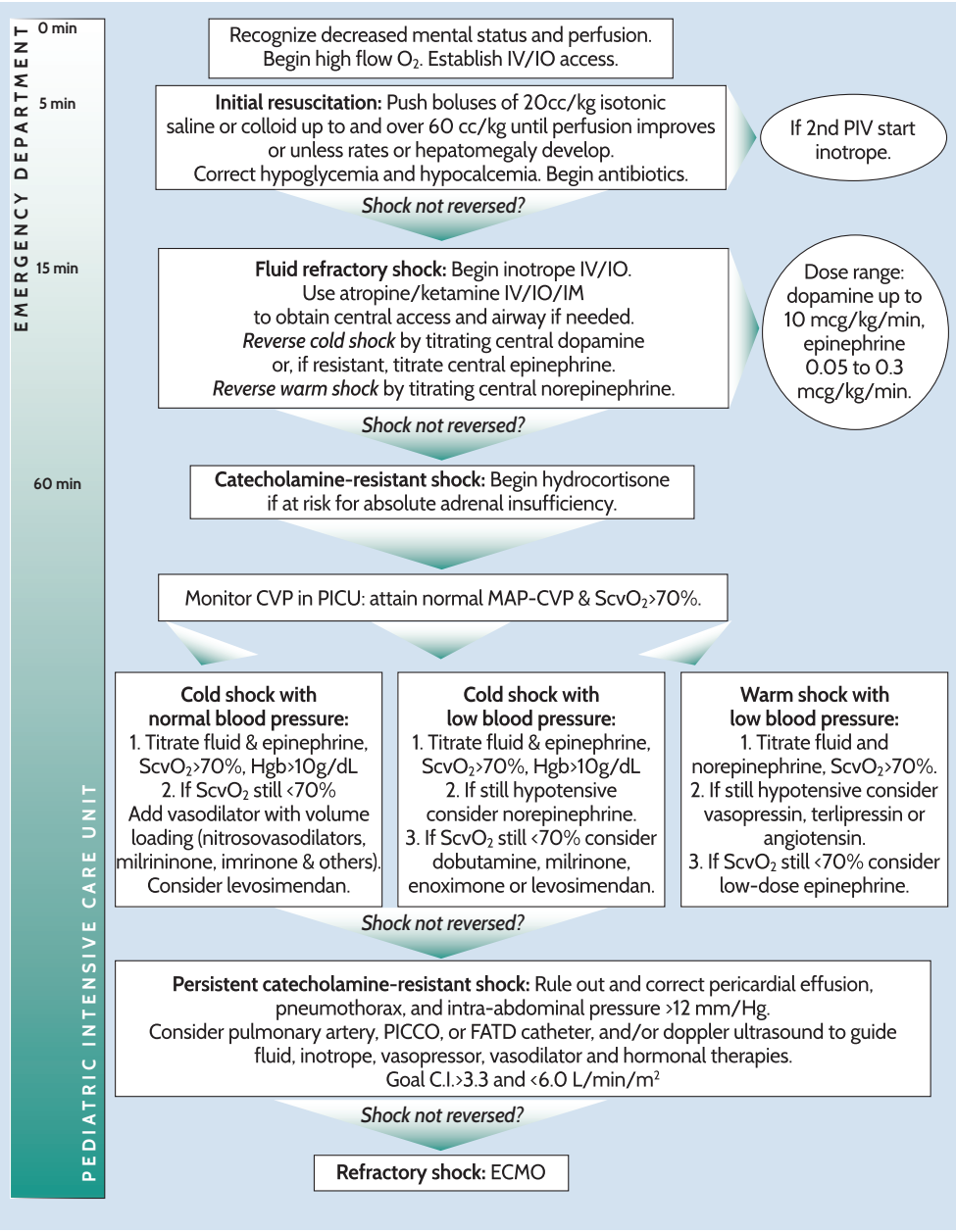
with fluid-refractory, catecholamine-resistant shock ith suspected or proven adrenal insufficiency (AI). Risk factors for AI include septic shock with purpura, chronic steroid therapy, and children with pituitary or adrenal abnormalities. Corticosteroids for patients in septic shock without AI have not been shown to improve mortality.[11]

Blood and plasma

Prior guidelines made no graded recommendations for blood product utilization. Now, it is strongly recommended that pediatric patients in a shock state with $Scvo_2$ <70% have a target Hgb ≥10. After stabilization and recovery from shock and hypoxemia, a target Hgb ≥7 is reasonable.

Platelet transfusion is suggested if platelet counts are <10,000/mm^3 without bleeding or if <20,000/mm^3 and at high risk of bleeding. Platelet counts ≥50,000/mm^3 are advised for any active bleeding, or for invasive procedures or surgeries.

FIGURE 1. Management of hemodynamic support in infants and children with septic shock.[7]



UPDATES IN SUPPORTIVE THERAPY

Glucose

Previous guidelines made no graded recommendations on glycemic control. Current guidelines suggest preventing hyperglycemia with targets of ≤180 mg/dL.

The latest body of literature supports a significant relationship between hyperglycemia and increased mortality. Hyperglycemia has been shown to be associated with the need for renal replacement therapy or inotropes, longer pediatric ICU stays, and nosocomial infections.[12-14] Insulin therapy should include glucose infusion in newborns and children.

Mechanical ventilation

No particular recommendations regarding mechanical ventilation were made with previous guidelines. Current guidelines suggest the use of lung protective strategies during mechanical ventilation (e.g., pressure release, high-frequency oscillatory mode). The goal is to maintain oxygenation with higher mean airway pressures (peak >30-35 cm H_20) and effective tidal volumes (6-8 mL/kg) with adequate CO_2 removal.

SUMMARY

Adherence to ACCM-PALS guidelines and "golden hour" resuscitation goals, along with proper antibiotic administration, are key management actions in the ED. Important updates include the use of vasopressors based on hemodynamic state, recommendations for blood product use, steroids, and glycemic control.

The effective management of sepsis starts in the ED. If done well, our actions can translate to improved outcomes and shorter hospital stays for these patients. ✶

RISK MANAGEMENT PITFALLS FOR ACUTE OTITIS MEDIA IN CHILDREN

EB MEDICINE
Improving Patient Care

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

1 "I gave the patient a script for antibiotics, so he didn't need pain medication."

Always treat a patient's pain, regardless of the choice to give antibiotics. Ibuprofen and/or acetaminophen are first-line therapies, but topical analgesics may be used as well. Narcotics should be reserved for children with severe otalgia resistant to first-line therapies.

2 "The child had a red TM on otoscopic examination, so I treated him for AOM."

Erythema of the TM alone is not specific for AOM. The TM can be red for other reasons, including crying, high fever, and manipulation of the ear canal (such as from cerumen removal). A slightly red TM alone is not predictive of AOM, while a distinctly red or hemorrhagic TM is slightly suggestive. The diagnosis of AOM correlates most with mobility and position (a bulging, immobile TM). The 2013 AAP guidelines require a bulging TM and evidence of middle ear effusion on pneumatic otoscopy for diagnosis of AOM.

3 "It was difficult to perform an otoscopic examination on this child, so to be safe, I skipped it and diagnosed him with AOM and treated him with antibiotics."

Clinicians should make their best effort to perform an adequate otoscopic examination in children to spare them from unnecessary antibiotics. The child should be calmed and placed in the caregiver's lap for examination. Cerumen should be removed if it obstructs the view of the TM (this can be achieved with docusate sodium and irrigation or by manual extraction). The emergency clinician should perform pneumatic otoscopy on all patients to confirm the presence of a middle ear effusion. Certain patients with a definitive diagnosis of AOM may not require antibiotics.

4 "This patient had ongoing ear pain for more than 1 week and signs of middle ear effusion on otoscopic examination but no TM bulging. I treated her with antibiotics."

There is no evidence that antibiotics are beneficial for otitis media with effusion (OME). OME, by definition, is not an acute process. AOM requires moderate to severe bulging of the TM or acute onset of symptoms (< 48 h) plus mild TM bulging or intense erythema of the TM for diagnosis.

5 "This patient returned to the ED with persistent middle ear effusion after an episode of AOM. This represented a failure of treatment, so I prescribed a stronger antibiotic."

Persistent middle ear effusion is very common after an episode of AOM, but it should resolve after three months. Patients with persistent effusions should be referred to their pediatrician, as they may need further testing to assess for hearing loss or cognitive delays. There is no need to change their antibiotic regimen.

6 "I was worried that this patient with AOM would develop a serious complication such as mastoiditis or meningitis if I didn't treat him with antibiotics."

There is no evidence that delayed or withdrawn antibiotics are associated with mastoiditis or meningitis, which are extremely rare complications of AOM. Some studies have shown an association between mastoiditis and recent antibiotic use. Do not prescribe antibiotics solely to avoid these complications.

7 "My patient had a history of recurrent AOM and presented to the ED today with ear pain and findings of AOM on otoscopy. He had no fever and looked well, so I treated him with the watchful-waiting approach."

History of recurrent AOM was considered a contraindication to observation in the 2004 AAP/AAFP guidelines. The 2013 guidelines do not specifically list recurrent AOM as a contraindication to observation; however, management of these patients can be difficult. Emergency clinicians should consider consulting a specialist or discussing the case with the child's pediatrician before initiating treatment. Some patients with recurrent AOM may benefit from tympanocentesis to isolate the causative middle ear pathogen, a procedure rarely performed in the ED. The 2013 AAP guidelines recommend amoxicillin-clavulanate (or an alternative antibiotic with beta-lactamase coverage) for patients with a history of recurrent AOM unresponsive to amoxicillin. ✶

RISK MANAGEMENT PITFALLS

TRAUMA IN THE PREGNANT PATIENT

AN EVIDENCE-BASED APPROACH TO MANAGEMENT

EB MEDICINE
Improving Patient Care

From the April 2013 issue of *Pediatric Emergency Medicine Practice*, "Trauma In The Pregnant Patient: An Evidence-Based Approach To Management." Reprinted with permission. To access your EMRA member benefit of free online access to all *EM Practice*, *Pediatric EM Practice*, and *EM Practice Guidelines Update* issues, go to www.ebmedicine.net/emra, call 1-800-249-5770, or email ebm@ebmedicine.net.

1 "She told me she wasn't pregnant."
Incidental finding of pregnancy occurs, and it can happen to your trauma patient as well. Any female of reproductive age involved in trauma should have a screening pregnancy test sent as part of the initial workup.

2 "She wasn't complaining of abdominal pain, so I wasn't worried about the pregnancy."
Even relatively minor orthopedic injuries have been associated with adverse perinatal outcomes due to occult intrauterine trauma. All pregnant patients beyond 24 weeks—even those with relatively minor trauma—should have electronic fetal monitoring to assess for intrauterine pathology for a minimum of four to six hours.

3 "She didn't look like she was that far along, so I wasn't worried about the fetus."
Gestational age can be assessed by fundal height, bedside ultrasound, or prior medical records, but it should be assessed and the emergency clinician should err on the side of fetal viability, especially with regard to major resuscitations.

4 "I wasn't worried about bleeding, so I didn't order Rho(D) immune globulin."
Even minor trauma can result in fetal-maternal hemorrhage and complications in subsequent pregnancies in Rh-negative mothers. All pregnant patients with abdominal trauma or significant mechanism of injury should be Rh(D) typed and administered empiric Rho(D) immune globulin if they are Rh-negative.

5 "She looked fine, so I just discharged her home."
The abdominal examination and laboratory tests can be deceptive, even with minor trauma. All pregnant trauma patients should have a minimum of 4 to 6 hours of electronic fetal monitoring and obstetric follow-up prior to discharge from the ED.

6 "She was worried about radiation risks, so we didn't do the imaging studies I would have normally done."
The relative risk of radiation for most routine ED x-rays and CT scans is well below the recommended threshold of radiation exposure during pregnancy and shouldn't inhibit a thorough workup for trauma.

7 "I wanted to give the mother one round of CPR and check for fetal heart activity before doing a perimortem cesarean section."
The indication for perimortem cesarean section is loss of vital signs, and in order to have the baby out in less than five minutes, no delay should be undertaken before performing this potentially life-saving maneuver.

8 "I didn't ask about domestic violence."
Domestic violence is more common during pregnancy and, frequently, a victim's first contact with a medical provider is in the ED. Simple screening questions, asked in a private setting, can evaluate for further potential injuries.

9 "I figured she was wearing her seat belt."
The number 1 source of mortality for pregnant women is motor vehicle trauma. Education regarding proper lap- and shoulder-belt placement can prevent life-threatening injuries.

10 "We just laid her down, and she suddenly lost her vital signs."
The supine hypotensive syndrome is common in later pregnancy and can result in syncope and dramatically reduced cardiac output. It is easily avoided by keeping the patient in the left-lateral decubitus position or by tilting the spine board 15° to the left. ✶

24|7|365

THE EVOLUTION OF EMERGENCY MEDICINE

DOCUMENTARY PREMIERES AT ACEP13 • OCT 15

ONE films

EMRA PRESENTS A ONE FILMS PRODUCTION "24|7|365"

EXECUTIVE PRODUCER ANN PRUM WRITTEN BY JAIME BERNANKE DIRECTED BY DAVE THOMAS

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UPCOMING EVENTS

Aug 8–10 — ACEP Teaching Fellowship
Dallas, TX

Aug 31 — EMRA Fall Representative Council Resolutions
Deadline

Sept 1 — EMRA Leadership Essay Contest
Deadline

Sept 10 — EMRA Board of Directors Candidate Application
Deadline

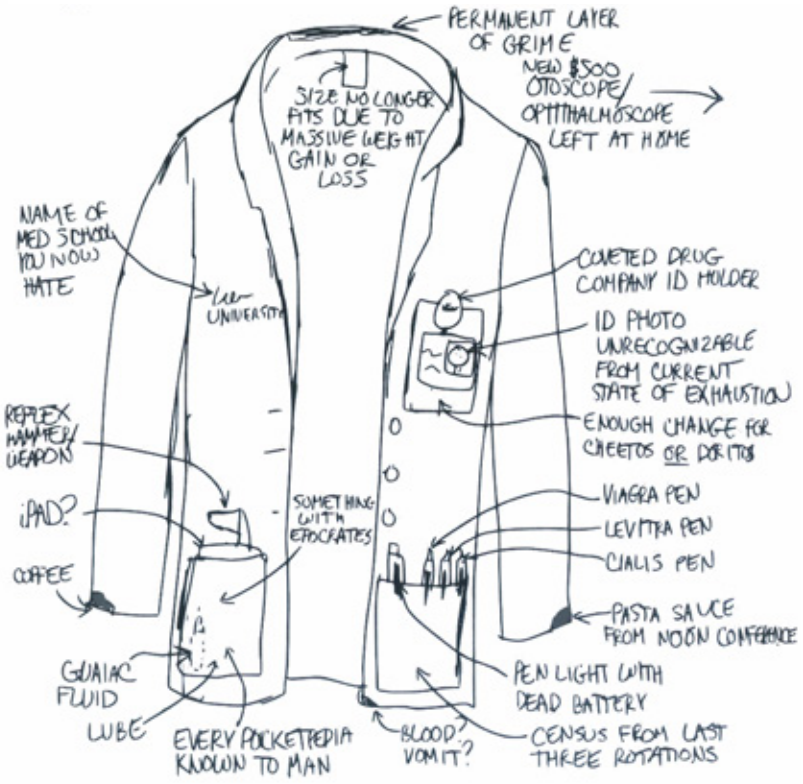
Oct 11–17 — ACEP13 *Scientific Assembly*
Seattle, WA
See page 18 for a complete schedule of EMRA events.

Oct 15 — EMRA 24|7|365 Documentary Film Premiere
Seattle, WA

Nov 4–11 — Emergency Medicine Basic Research Skills (EMBRS) Workshop
Dallas, TX

Nov 11–17 — Nov 11–17 ABEM Qualifying Exams
Nationwide

What's Inside Your White Coat?



REPRINTED COURTESY OF *A CARTOON GUIDE TO BECOMING A DOCTOR* BY DR. FIZZY MCFIZZ

DEADLINE ALERT

Win Dinner with an EM Luminary

ENTER EMRA'S LEADERSHIP ESSAY CONTEST

This year in Seattle ACEP will host intimate dinners with legends and leaders of emergency medicine during its much-anticipated DineAround event, and **EMRA wants YOU to have a seat at the table! EMRA is looking for essays that highlight leadership development in our specialty.**

Tell us

- **how being involved with EMRA has prepared you for a leadership role**
- **has allowed you to accomplish a specific goal as a leader**
- **or has enhanced your education and career development by defining what it means to be a leader.**

Please limit your response to 250 words and submit your essay to rdonihoo@emra.org by September 1. The top 12 submissions will be awarded fully paid seats at one of the ***ACEP DineAround dinners.***

Anesthesiology Critical Care Medicine Certification Approved for Emergency Physicians

On June 26, 2013, the Board of Directors of the American Board of Medical Specialties (ABMS) unanimously approved certification in Anesthesiology Critical Care Medicine (ACCM) through a joint sponsorship of the American Board of Anesthesiology (ABA) and the American Board of Emergency Medicine (ABEM). **This co-sponsorship arrangement provides an opportunity for emergency medicine residency graduates to pursue a unique two-year ACCM fellowship training pathway.** Upon successful completion of that training, qualified physicians will be able to seek ACCM subspecialty certification.

Any Accreditation Council for Graduate Medical Education (ACGME)-accredited ACCM fellowship program that wishes to offer a two-year fellowship must first apply to the ABA for approval. The eligibility criteria, timeline, and administrative process for emergency physicians to access the ABA Critical Care Medicine Certification Examination, as well as the application process for ACCM fellowship programs are available on the ABA and ABEM websites (www.theABA.org and www.ABEM.org).

ABA President, Douglas B. Coursin, M.D., stated, "ABA is pleased to see the culmination of the many efforts of members of the anesthesiology and emergency medicine communities in helping to create this new CCM pathway founded on an interdisciplinary and multi-professional approach to the care of critically ill surgical and medical patients."

ABEM President, John C. Moorhead, M.D., stated, "ABEM appreciates the collaboration with the American Board of Anesthesiology to develop this opportunity, which further recognizes the significant interest in critical care medicine within the emergency medicine education community."

ACCM becomes the eighth subspecialty available to ABEM-certified physicians along with **Emergency Medical Services, Hospice and Palliative Medicine, Internal Medicine-Critical Care Medicine, Medical Toxicology, Pediatric Emergency Medicine, Sports Medicine,** and **Undersea and Hyperbaric Medicine**. ✶

EM Physician Leaders Selected for Top Fellowships

Kudos to the distinguished new cohort of Robert Wood Johnson Foundation Clinical Scholars! Four of the 28 incoming scholars are emergency medicine physicians – and proud EMRA members. We're thrilled to congratulate these academic superstars, who will begin their fellowships in 2014.

- **Whitney Cabey, MD,** a medical school alumna of the University of Michigan and resident at Carolinas Medical Center. Dr. Cabey's fellowship is supported in part through the U.S. Department of Veterans Affairs; she will begin her fellowship at the University of Pennsylvania.
- **Laura Medford-Davis, MD,** a medical school alumna of Harvard University and resident at Baylor University. Dr. Medford-Davis will begin her fellowship at the University of Pennsylvania.
- **William Fleischman, MD,** a medical school alumnus of the State University of New York – Buffalo, and resident at Mt. Sinai Medical Center. Dr. Fleischman will conduct his fellowship at Yale University.
- **Nir Harish, MD,** a medical school alumnus of Harvard University and resident at Denver Health Medical Center. Dr. Harish will conduct his fellowship at Yale University.

Through the program, scholars will spend two years examining the delivery, impact, and organization of health care. In addition to training in leadership, health policy, and health services research methods, *Clinical Scholars* are trained in community-based participatory research (CBPR). By engaging community members in the research process, the CBPR model creates a two-way exchange that aims to improve health behaviors while bringing resources and greater visibility to the health issues within a particular community. ✶

2013 CPC Semi-Final Competition Winners

Congratulations to the winners of the 2013 National Emergency Medicine Clinical Pathologic Case Presentation (CPC) Semi-Final Competition, sponsored by ACEP, CORD, EMRA and SAEM! **The competition was fierce at this year's event, held at the SAEM Annual Meeting in May.** Eight-eight emergency medicine residency programs submitted cases in the preliminary round, which were judged on quality, applicability to emergency medicine, and solvability. Seventy-two of the best cases were chosen for the semi-final competition. Presenting residents were scored on quality, organization, style and clarity. Competing faculty members were judged on the thoroughness of the differential diagnosis, diagnostic reasoning, and presentation skills.

Stay tuned for more details on the final competition, which will be held at ACEP13 *Scientific Assembly* on Monday, Oct. 14 in Seattle!

DIVISION 1

Resident Presenter: Kristen Mueller, MD, Washington University in St. Louis; ***Faculty Discussant:*** Susan Spano, MD, UCSF-Fresno

Faculty Discussant Runner-up: Michael May, MD, University Hospitals Case Western Reserve; ***Resident Presenter Runner-up:*** Kseniya Orlik, MD, Akron General Medical Center

DIVISION 2

Resident Presenter: Elisabeth Lessenich, MD, MPH, Brigham & Women's/Massachusetts General Hospitals; ***Faculty Discussant:*** Ciara Barclay-Buchanan, MD, Sinai Grace Hospital-DMC

Resident Presenter Runner-up: Michael McMahon, MD, New York Methodist Hospital; ***Faculty Discussant Runner-up:*** Laura Melville, MD, New York Methodist Hospital

DIVISION 3

Faculty Discussant: Richard Byrne, MD, Cooper University Hospital; ***Resident Presenter:*** Emory Liscord, MD, Boston Medical Center

Resident Presenter Runner-up: Zara Mathews, MD, Mount Sinai ***Faculty Discussant Runner-up:*** Ryan Bodkin, MD, University of Rochester/ Strong Memorial Hospital

DIVISION 4

Faculty Discussant: Erin Zimny, MD, Henry Ford Hospital Combined EM/ IM; ***Resident Presenter:*** Lee Puckett, MD, PhD, University of California, Irvine

Resident Presenter Runner-up: Brian Driver, MD, Hennepin County Medical Center Combined EM/IM ***Faculty Discussant Runner-up:*** Jonathan Ratcliff, MD, MPH, University of Cincinnati *(not pictured)*

DIVISION 5

Resident Presenter: James McKean, MD, Advocate Christ Medical Center; ***Faculty Discussant:*** Aaron Dora-Laskey, MD, Central Michigan University College of Medicine

Resident Presenter Runner-up: Jonathan Miller, MD, Maine Medical Center; ***Faculty Discussant Runner-up:*** Dan Miller, MD, University of Iowa

DIVISION 6

Faculty Discussant: Jeffrey Sankoff, MD, Denver Health; ***Resident Presenter:*** Keegan Tupchong, MD, NYU/Bellevue Hospital Center

Resident Presenter Runner-up: Emily Mills, MD, University of Michigan St. Joseph Mercy Hospital; ***Faculty Discussant Runner-up:*** Chaiya Laoteppitaks, MD, Albert Einstein Medical Center (*not pictured*)

DEADLINE ALERT

EMRA Leadership Opportunities

YOUR VOTE **COUNTS!**

LEARN LEAD SERVE

JOIN EMRA'S BOARD OF DIRECTORS!

SHARE YOUR VISION FOR THE **FUTURE** OF **EMERGENCY MEDICINE** AND BECOME A **STEWARD OF THE SPECIALTY.**

PRESIDENT-ELECT

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.

OPPORTUNITY Knocks!

Don't Miss These Important EMRA Events at ACEP13 *Scientific Assembly*

EMRA Residency Fair

October 13, 2013

Do you know where you want to match?

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

EMRA Job Fair

October 14, 2013

Looking for that perfect job?

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

CALLING ALL EXHIBITORS!

Registration now open

For exhibitor information on EMRA's 2013 Job or Residency Fairs in Seattle, please contact Leah Stefanini at lstefanini@emra.org or call 866-566-2492 x3298.

Visit www.emra.org for more details.

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.

1. Which of the following is an early sign of superior vena cava syndrome?
   A. Cyanosis
   B. Facial plethora
   C. Facial swelling
   D. Upper extremity edema

2. A 35-year-old man presents with vomiting, abdominal cramping, and tachycardia 4 hours after attending a barbeque at a local lake. After several hours of swimming, he ate two well-done hamburgers and a large bowl of potato salad. His wife is being treated for similar symptoms and diarrhea. What is the best management strategy?
   A. Administer intravenous fluids and antiemetic agents
   B. Begin aggressive rehydration and empiric antibiotics after Escherichia coli 0157:H7 culture
   C. Prescribe antibiotics and advise all close contacts to seek medical care, even if asymptomatic
   D. Send stool sample for fecal Gram stain, culture, and leukocytes and begin antibiotics pending results

3. Which of the following orbital fractures warrants consideration of emergent surgical consultation?
   A. Inferior orbital fracture
   B. Lamina papyracea fracture
   C. Medial orbital fracture
   D. Orbital roof fracture

4. A 60-year-old woman presents with shortness of breath and intermittent chest pain that have worsened over the past 3 days. Vital signs include blood pressure 110/65, pulse 105, respirations 26, and oxygen saturation 93% on room air. Examination reveals bibasilar crackles, lower extremity edema, and a systolic ejection murmur heard best at the right sternal border of the second intercostal space that radiates into the carotids. Which of the following statements about her condition is correct?
   A. Her valvular disease is too severe to be treated medically and requires emergent valve replacement
   B. She is more likely to have systolic heart failure than diastolic heart failure
   C. She needs aggressive diuresis to treat her heart failure
   D. Vasodilators will decrease her preload and worsen her symptoms

5. A 32-year-old woman presents with a productive cough of 3 days' duration. She does not smoke and has not had fever or chills. Past medical history is unremarkable, and she takes no medications. When asked to describe the sputum, she says it is white. Rhonchi are noted on examination, and the chest radiography findings are normal. What should be the next step in management?
   A. Administer albuterol
   B. Administer azithromycin
   C. Administer steroids
   D. Order ABG analysis

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

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Meriden, New London and Stamford: MidState Medical Center is a modern community situated between Hartford and New Haven seeing 60,000 EM pts./yr. Lawrence & Memorial is a Level II Trauma Center on the coast near Mystic seeing 50,000 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, 800-828-0898 or fax 330-493-8677.

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ILLINOIS

Chicago Heights/Olympia Fields, Joliet and Kankakee: EMP manages EDs at several community teaching hospitals seeing 32,000 – 71,000 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 44,000 pts./yr.), Presence Saint Joseph's (71,000 pts./yr.) and Presence St. Mary's (32,000 pts./yr.) hospitals. 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, 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 65,000 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, 800-828-0898 or fax 330-493-8677.

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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/BP in EM, IM or FP. What's Important To You…Is What Matters To Us!® **Excellent compensation**, 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-

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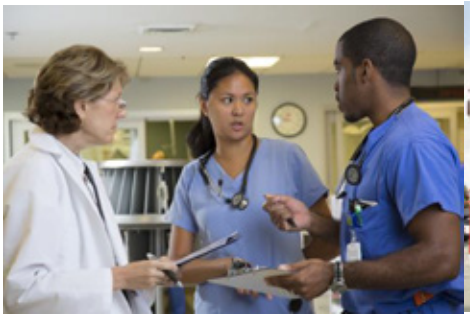

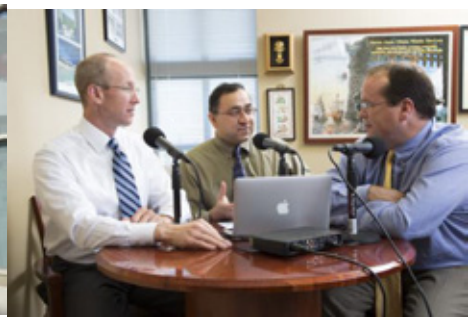

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NEW YORK

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: Patricia Rosati, Physician Recruiter, 800.394.6376, fax 631.265.8875, prosati@neshold.com.

Long Island, Albany and Cortland: Brookhaven Memorial Hospital Medical Center is in East Patchogue on the southern shore of Long Island and sees 73,000 ED pts/yr. Cortland Regional Medical Center is a modern, full-service facility situated in the Finger Lakes Region between Syracuse and Ithaca (35,000 ED pts/yr). Albany Memorial Hospital has a new ED (47,000 pts/yr) and hosts EM resident rotations, while Samaritan Hospital in Troy is a respected community hospital minutes from Albany seeing 47,000 ED pts/yr. Outstanding partnership opportunity includes equal profit sharing, equity ownership, funded pension, open books, full benefits and more. Contact Ann Benson, (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd, NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

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 10,000 -99,000+ pts./yr. EMP is an exclusively physician owned/managed group with open books, equal voting, equal equity ownership, funded pension, comprehensive benefits

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

Charlotte area: CaroMont Regional Medical Center is situated just west of Charlotte in Gastonia. This modern, full-service facility sees 99,000+ emergency pts./yr. and is a Level III Trauma Center. EMP is an exclusively physician owned/managed group with open books, equal voting, equal equity ownership, funded pension, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

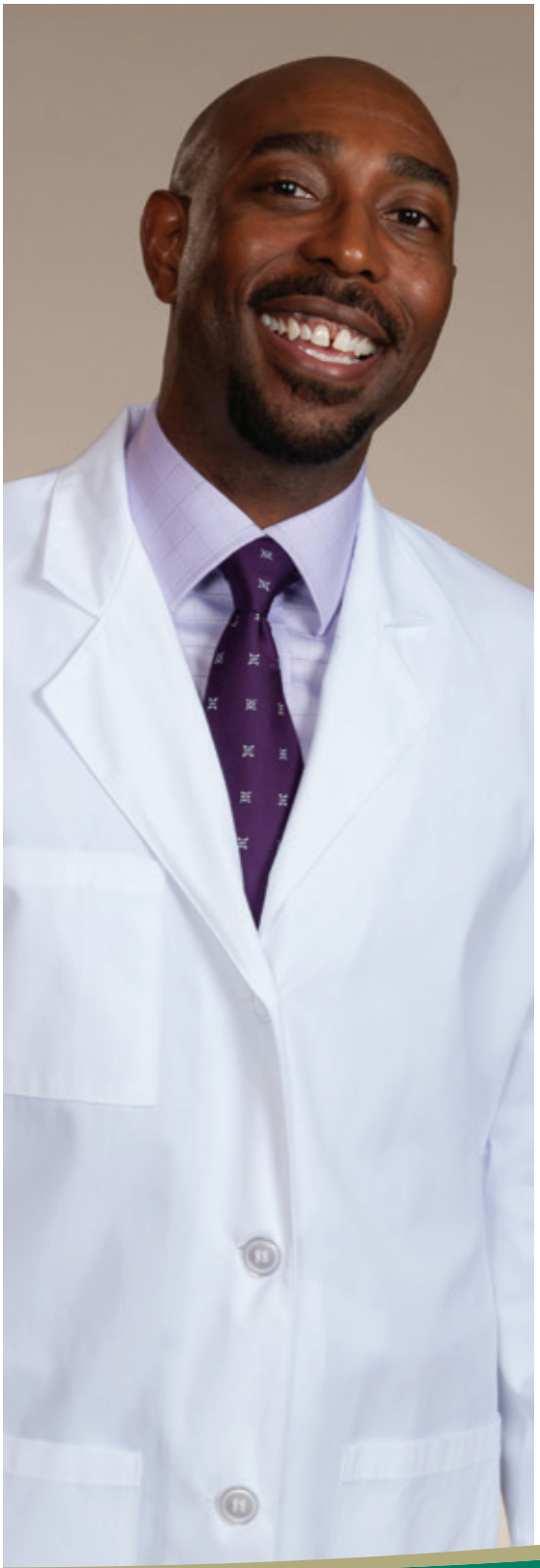
New Bern: Respected 313-bed regional medical center located at the intersection of the Trent and Neuse Rivers just off the central coast, seeing 73,000 ED pts./yr. Outstanding partnership opportunity includes equal profit sharing, equity ownership, funded pension, open books, full benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

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...or choose delayed shareholder status and receive additional compensation. Our mid-sized group offers the flexibility and access of independent groups without sacrificing the financial stability of larger groups. Excellent package includes generous rates, 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.

Columbus: Choose city or small-town living working in this NW Columbus suburb. Excellent opportunity in 21,000 volume ED. Enjoy the advantages of a physician-led, equity-ownership group offering appealing package with malpractice, family medical plan, CME, employer-funded pension and shareholder status at one year with no buy-in. Or you may elect delayed shareholder status and receive additional compensation. Make the most of today without sacrificing your future. Contact Amy Spegal, Premier Physician Services, (800)726-3627, ext 3682, aspegal@premierdocs.com fax (937) 312-3683.

Concord, Madison and Willoughby: EMP is pleased to announce our newest partnership with Lake Health in the eastern Cleveland Suburbs. TriPoint Medical Center was built in 2009 and treats 31,000 emergency pts./yr. The Madison Medical Campus hosts a freestanding ED seeing 12,000 pts./yr.West Medical Center is a state of the art acute care hospital serving 37,000 ED pts./yr. Outstanding partnership opportunity includes weekend shift differential, performance pay, equal equity ownership, equal voting, funded pension, open books, comprehensive benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.



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Medina and Wadsworth: Combined two-site position at a brand new free-standing ED (~7,000 pts/yr) and established community hospital (19,000 pts/yr). Nice communities are near Akron and the area's most desirable residential communities. Outstanding partnership opportunity includes equal profit sharing, equity ownership, funded pension, open books, full benefits and more. Contact Ann Benson (careers@emp.com), Emergency Medicine Physicians, 4535 Dressler Rd. NW, Canton, OH 44718, 800-828-0898 or fax 330-493-8677.

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

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, 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

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Urbana: EMP is pleased to announce another one 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, 800-828-0898 or fax 330-493-8677.

OKLAHOMA

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PENNSYLVANIA

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

Sharon: Sharon Regional Health System has an extremely supportive administration/medical staff, newer ED, and full service capabilities making this a great place to work, with 38,000 patients treated annually. Small city setting offers beautiful housing and abundant recreation less than an hour from Pittsburgh and Cleveland. Outstanding partnership

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Wexner Medical 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).

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

Pittsburgh: Allegheny Valley Hospital in Natrona Heights boasts a brand new ED seeing 37,000 emergency pts./yr. Forbes Regional Hospital is a respected facility in Monroeville seeing 43,000 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, 800-828-0898 or fax 330-493-8677.

RHODE ISLAND

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

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The Department of Emergency Medicine of the George Washington University is seeking physicians for our academic practice. Physicians are employed by Medical Faculty Associates, a University-affiliated, not-for-profit multispecialty physician group and receive regular faculty appointments at the University. The Department provides staffing for the Emergency Units of George Washington University Hospital, the Walter Reed National Military Medical Center and the DC Veterans' Administration Medical Center. The Department sponsors a Residency, 9 Fellowships and a variety of student programs.

We are seeking physicians who will participate in our clinical and educational programs and contribute to the Department's research and consulting agenda. Rank and salary are commensurate with experience.

Basic Qualifications: Physicians should be residency trained in Emergency Medicine. Application Procedure: Please complete an online faculty application at http://www.gwu.jobs/postings/15715 and upload a CV and cover letter. Review of applications will begin on August 1, 2013 and continue until all positions are filled. Only complete applications will be considered. Any inquiries about the position should be sent to Robert Shesser M.D., Professor and Chair; rshesser@mfa.gwu.edu.

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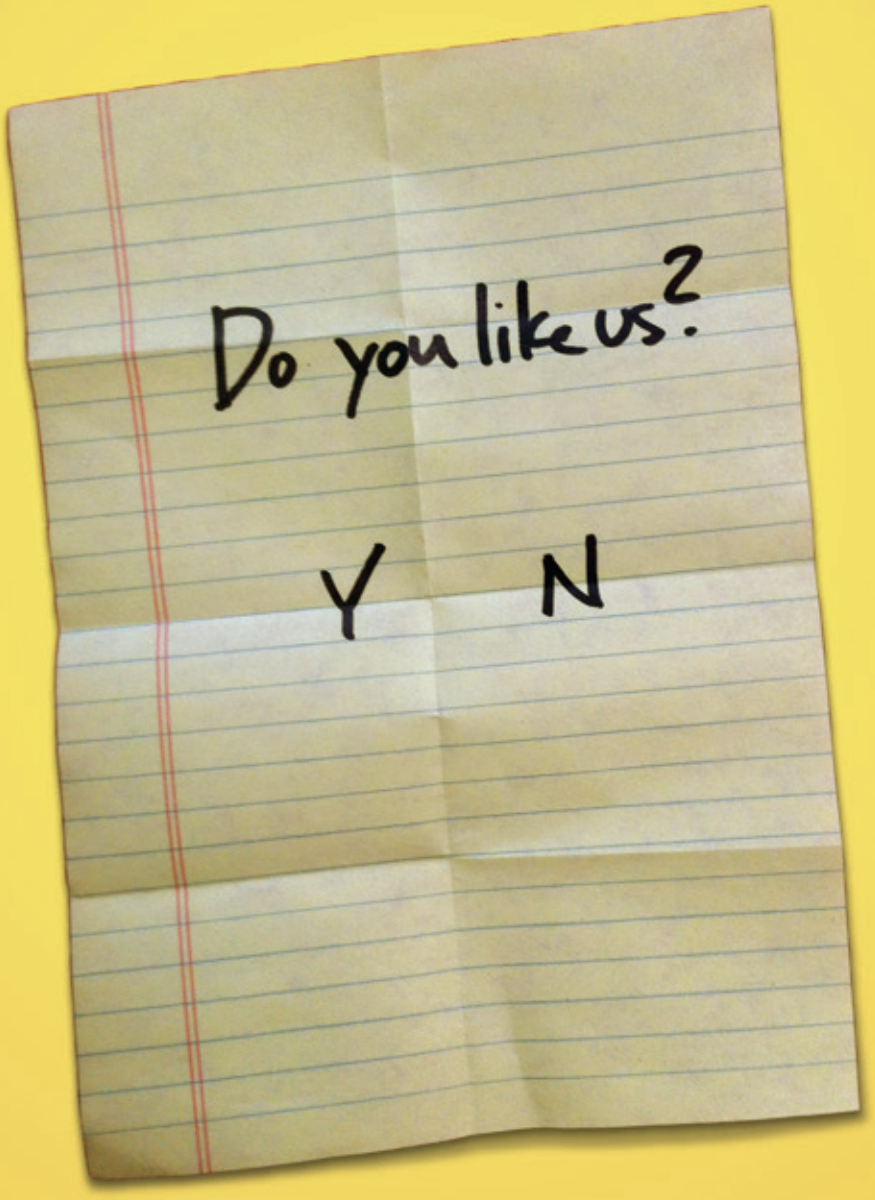

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