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Pros & Cons: Does Size Matter?

Emergency medicine leaders weigh in for this
democracy roundtable discussion

INTRODUCTION

by KEVIN KLAUER, DO, EJD, FACEP

For decades, the concepts of democracy and democratic group practice have been held as the standard to strive for in emergency medicine. As democracy is akin to motherhood and apple pie, these concepts are accepted today, perhaps, just as they were decades ago. However, with the evolving landscape of health care, is it time to revisit these concepts? Is democracy a group structure or an ideal? Democracy can provide an opportunity to participate in group decisions and control one's own destiny (to a certain extent), but democracy means that, on occasion, you may not get what you want if you are in the minority. Is democracy truly what emergency physicians want, or has fair and equitable treatment become the practical definition of "democracy"? In Part 2 of this three-part series, EM leaders from different walks of life will weigh in on the following questions. Check out the October issue or ACEPNow.com to read Part 1.

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QUESTIONS

1. What is the definition of "democracy"?
a) How do you measure democracy?
2. Is democracy a group structure or an ideal?
3. Do you think there is confusion about what democracy offers in EM?
4. Is this just marketing or substance in emergency medicine?
5. In a democratic group, do physicians get to vote on everything or just certain things?
6. Does democracy have obligations/responsibilities associated with it (eg, financial, covering additional shifts, etc.)?
7. Does a lack of democracy mean you will not be treated fairly? (Is fair treatment confused with democracy?)
8. What are the pros and cons of democratic groups and non-democratic groups?

The White Whale

Our search for pulmonary embolism leads to overuse of CT scans

by RYAN PATRICK RADECKI,
MD, MS

In the vast ocean of medicine, few diagnostic dilemmas descend so quickly into madness as does pulmonary embolism (PE). In the classical teaching, PE remains one of a handful of life-threatening diagnoses considered in the context of chest pain or shortness of breath. The proliferation of ad-

PEARLS FROM THE MEDICAL LITERATURE



vanced imaging technology has also dramatically eased evaluation for PE, leading to an explosion of testing. Sadly, the cumulative effect of such expanded testing appears to

be a pervasive preponderance of negative studies and low-yield, but costly, utilization.

And, frankly, it's even worse than we've acknowledged.

The vast majority of PEs are diagnosed using one test, the computed tomography (CT) pulmonary angiogram. This test gained widespread acceptance with the Prospective Investigation of Pulmonary Embolism Diagnosis (PIOPED) studies, demonstrating adequate sensitivity for PE compared with conventional angiography.¹ Sensitivity is a valuable test attribute for a disease believed to have a high case-fatality rate. However, as technology has improved, CT has begun detecting smaller and smaller clots. By assigning the same clinical significance across the disease severity spectrum, it becomes unclear whether this improved sensitivity benefits our patients and whether our test specificity is adequate for our current strategy.

The problem is twofold, and two specialties are complicit in this predic-

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CORRECTION

In the September 2015 issue, the article "Hocus POCUS: We Have a Diagnosis" (p. 12) neglected to credit Figure 1 to California ACEP. *ACEP Now* regrets this oversight. Visit California ACEP's website, <http://californiaacep.org/improving-health/pecarn>, for more tools for implementing the PECARN algorithm, including a downloadable version of the Pediatric Head Trauma CT Decision Guidelines for children older and younger than two years of age.

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THE BREAK ROOM



We have received many responses to the third part of our interview series with AMA President Steven J. Stack, MD, FACEP, "Strong Stance for Physicians: Dr. Stack talks doc shortages, APPs, and his teenage path to the presidency," (September 2015). Here is a selection of the responses—visit ACEPNow.com to read more comments.

AAPA Weighs In

AS THE PRESIDENT AND CHAIR OF THE BOARD of the American Academy of Physician Assistants (AAPA), I have appreciated the relationship we have had with the American Medical Association (AMA). I am, however, deeply concerned about recent statements you made in *ACEP Now* regarding the role PAs play in today's health care.

First, we completely agree with your statement that every provider should clearly identify themselves to patients. It is vital for patients to understand who is providing their care on the health care team. As an organization, we pursue truth in advertising and have clear guidelines to that effect.

On the other hand, in your statement, you group a number of different practitioners together including PAs, PharmDs, APNs, and NPs, disproportionately generalizing the role each of us plays and our goals. Specifically, you posit that "their professional societies' push for enhanced autonomy flies in the face of everything in the modern era that supports team-based care."

To be clear, we as PAs are individual health care practitioners striving to deliver the best patient care possible according to education, license, and experience. It is neither accurate nor productive to lump all providers and each of our objectives together.

As an organization, AAPA has made it our mission to uphold team-based care as a key pillar of the PA profession. PAs view medicine as a cooperative science, which is why teamwork and team-based care have long been at the core of a PA's training.

In your comments, you acknowledge that PAs, physicians, and other health care providers can work well together. PAs collaborate within the health care team, and in that dynamic, they make autonomous medical decisions daily for their patients.

In the transformative shift from volume to value, away from a system that reimburses for each medical service to one that incentivizes and rewards better care and results, the team-based model optimizes value. PAs are uniquely equipped and ready to play an important role in this paradigm. PAs connect the dots in team-based care, work to make prevention as important as treatment, and help keep costs down.

For nearly 50 years, PAs have improved patient outcomes and elevated patient satisfaction, and there is clinical evidence, as well as real-world patient encounters, that demonstrate the high quality and breadth of PA care. In fact, the Association of American Medical Colleges recently published a paper discrediting concerns that quality of care will decrease with the deployment of PAs.

Author E.S. Salsberg, GW School of Nursing, summarizes: "...The increased adoption of team-based care which, if done correctly,

allows for better use of skills of each member of the team..."

It is this type of coordinated, meaningful care that our system and patients benefit from, and we look forward to the next 50 years of continued collaboration with all of our health care practitioner colleagues.

We appreciate your consideration of our concerns and would be happy to discuss them and the AMA's position in further detail.

Jeffrey A. Katz, PA-C, DFAAPA
President and Chair of the Board, AAPA

Dr. Stack Responds

THANK YOU FOR YOUR LETTER REGARDING MY *ACEP Now* interview.

I attempted to express a collaborative approach to team-based care in which all clinicians perform roles consistent with their education and training and patients are fully informed of the qualifications of their care team members. I am grateful that a substantial portion of this message was received positively.

In this context, I certainly meant no offense to physician assistants and appreciate the commitment of physician assistants to the team approach to care. We value our partnership with physician assistants and your individual contributions as members of health care teams.

As you observe, health care in the United States is in the midst of profound change. We look forward to working with our physician assistant colleagues to make the most of these changes to ensure that patients throughout our nation have access to high-quality and affordable care.

Steven J. Stack, MD
President, AMA

SEMPA Weighs In

THIS LETTER IS IN RESPONSE TO THE ARTICLE featured in the September 14, 2015, issue of *ACEP Now* with Kevin Klauer, DO, EJD, FACEP, and Steven J. Stack, MD, FACEP, AMA President.

On behalf of the Society of Emergency Medicine Physician Assistants (SEMPA), the national organization that represents all physician assistants who practice in the emergency setting, we would like to offer supportive comments and some essential clarification of the PA role in a physician-led health care team.

As PAs, we wholeheartedly agree that physicians, by virtue of educational process, training, and specialty certification, are the most highly educated and trained clinicians in the health care system. We also absolutely agree with the Truth in Advertising campaign that the AMA has spearheaded. As clinicians who also have the patient's greatest interests at heart, PAs by law, statute, and professional ethics attempt to avoid any confusion or misrepresentation of our role, our title, and the profession. We feel that despite any advanced degree at the doctorate level, it is imperative that only a MD or DO be referred to as doctor in the clinical setting.

SEMPA, as the organization that represents emergency medicine PAs, would like to clarify that while we support the term of advanced

practice provider (APP) when referring to PAs and NPs collectively, PAs and NPs are two professionally independent groups, each with their own individual unique philosophy, educational/training model, and goals. PAs value being members of a team that provides excellent care for patients and believe that the team approach serves the patient more completely. For nearly 50 years, we, as physician assistants, have practiced medicine, with physician supervision, as members of a physician-led health care team. PAs have never sought independent practice, nor do we foresee a change in the philosophy of our profession.

In emergency departments across the country, PAs practice in a variety of roles to evaluate and manage patients and are proud of the work we do in emergency medicine. As highly skilled clinicians, we competently evaluate and treat a variety of emergency and acute care conditions with the clinical support and guidance of our supervising physicians and do not aspire to be perceived as physicians.

Our professional policies endorse our roles as members of the health care team, which recognizes the physician as the leader of that team, and we will continue to make clear and consistent efforts to communicate

our stance, which does not include independent practice.

The SEMPA Board of Directors

I WANTED TO THANK *ACEP NOW* FOR PUBLISHING the articles "Strong Stance for Physicians" and "A Perfect Partnership" (September 2015). I have been a physician assistant for many years and completely agree with ACEP's stance on clear advertising and not getting away from a team-based concept. I am currently completing a doctorate residency for PAs for the experience, but I would never describe myself as a doctor to patients. I agree this would be confusing and a misrepresentation of who and what I am as a part of the team. I appreciate the publishing of both articles to show that while ACEP has a strong, and in my opinion justified, stance against progressively more expanding autonomy that they still support and endorse the continued relationship between physician assistants and physicians to better care for our patients. Open communication and mutual trust is something that is going to be essential in the years to come as a solution for the physician shortage evolves. ☺

Zebulon L. Wilkin, CPT, SP, PA-C
US Army/Baylor EMPA Resident



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Balance Billing: The Lose-Lose

Ban it? Doctors lose dollars. Support it? Doctors anger patients.

by LIAM YORE, MD, FACEP

Balance billing is a matter in which emergency physicians have been placed in an indefensible position. While the underlying causes of balance billing disputes are nuanced and complex, the optics of the matter are inarguable: the physician issuing the bill is universally viewed as the “bad guy.” Bad cases make bad law, and it is the bad cases that make headlines. In New York, a surgeon billed a patient \$117,000 for his portion of a spinal surgery.¹ Emergency physician bills are far more modest but can still easily reach thousands of dollars when lifesaving services or invasive procedures are performed. Lawmakers, understandably outraged over what they see as abusive practices directed toward vulnerable patients, more and more are turning to outright bans on the practice of balance billing. The issue has even received a media-friendly, scary rebranding as “surprise billing.” Legislation restricting or banning this practice has been proposed or passed in New York, California, Washington, Illinois, Colorado, Florida, and more.

This is a potent threat to emergency physicians; a balance billing ban requires the physician to accept whatever the insurer will pay and no more. This gives the insurer unilateral rate-setting power. Our only negotiating power with carriers comes from the ability to go out of network. When California issued a blanket ban on balance billing, payments to physicians by carriers dropped drastically, by 20 percent overall and up to 33 percent by some payers.² This revenue loss directly impacts the salaries of emergency physicians.

The hardest thing about losing is to recognize that you are losing. What ACEP, state

chapters, and engaged physicians must accept is this: we cannot simply continue to oppose bans on balance billing. If we do, we will lose. Patients are being economically harmed, and though the fault is not ours, the solution must be ours. Emergency physicians are problem solvers by nature. We need to be at the table, proactively, with policy solutions that protect patients while preserving our ability to receive fair payment for services already provided.

The only acceptable solutions are those that will hold the patient harmless and provide a mechanism determining the amount the insurer must pay. With a friendly legislature, one such approach would be to mandate that the carrier must pay the full charges for out-of-network emergency patients. Colorado has passed a law to this effect, and despite fears that it might create an inflationary environment encouraging physicians to raise prices, this has not been observed to date.³

New York, with the participation of its ACEP chapter, recently passed legislation that might be a model for other states. This law obligates the carriers to hold patients harmless for care provided by out-of-network providers, with no increased out-of-pocket cost. It prohibits balance billing for nonemergency services and creates a dispute resolution process to determine payment levels. However, for emergency care provided by out-of-network physicians, balance billing is permitted. More critically, New York Chapter ACEP was successful in exempting the common ED services from the unwieldy and expensive dispute resolution process.⁴ Rather, ED services less than \$600 (after any applicable copayment or deductible) that do not exceed 120

percent of the usual and customary cost (UCR) are to be paid in full by the carrier. UCR is determined by using the 80th percentile of the FAIR Health database as a benchmark.

This more balanced (forgive the term) approach ensures reasonable payment to emergency physicians, encourages carriers to keep emergency physicians in network, protects patients, and removes any incentive for physicians to escalate their prices beyond what is reasonable by establishing a benchmark for UCR. Determining UCR, or some agreed upon standard for reasonable charges for services, is a critical component of any workable solution. The New York FAIR Health database is a nonprofit corporation and generally considered unbiased. ACEP’s Emergency Medicine Action Fund is working to create an economic registry that might also serve a similar function.

WE NEED TO BE AT THE TABLE, PROACTIVELY, WITH POLICY SOLUTIONS THAT PROTECT PATIENTS WHILE PRESERVING OUR ABILITY TO RECEIVE FAIR PAYMENT FOR SERVICES ALREADY PROVIDED.

ACEP remains active in addressing this matter. A task force has been convened to find policy solutions and develop model legislation that individual state chapters can bring to their legislators when this issue inevitably arises in their jurisdiction. As a specialty, our challenge is to recognize the unfavorable political terrain, to concede that the practice of balance billing is untenable, and to unite around a policy solution that protects patients while also maintaining the integrity of the safety net of the emergency department. 📌

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DR. YORE is an emergency physician at Providence Regional Medical Center in Everett, Washington.



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Urological Trauma

The European Association of Urology guidelines

BY MARK PIERCE, MD

The ACEP Clinical Policies Committee regularly reviews guidelines published by other organizations and professional societies. Periodically, new guidelines are identified on topics with particular relevance to the clinical practice of emergency medicine. This article highlights recommendations for evaluation of blunt renal trauma published by the European Association of Urology in 2014.

In 2014, the European Association of Urology published its “Guidelines on Urological Trauma.”¹ The guidelines are quite expansive and offer recommendations on management of renal, ureteral, bladder, urethral, and genital trauma. In this article, I will highlight the recommendations on renal trauma that are applicable to emergency physicians.

These guidelines are based on a relevant literature review of several databases including MEDLINE, Embase, and Cochrane. The authors point out that most of the findings and recommendations are based on case reports and retrospective case series and recognize that the paucity of high-quality randomized controlled trials makes it difficult to make compelling recommendations. The European Association of Urology uses a grade A through C recommendation paradigm. **Grade A** recommendations are based on good-quality and consistent studies, including at least one randomized trial. **Grade B** recommendations are based on well-conducted clinical studies without randomized clinical studies. Lastly, **Grade C** recommendations are made without directly applicable clinical studies of good quality.

However, there is a big caveat to this paradigm. As the guidelines state, “Alternatively, absence of high level of evidence does not necessarily preclude a grade A recommendation, if there is overwhelming clinical experience and consensus.”¹ The authors denote this recommendation grade by labeling such recommendations as A*.

Epidemiology

Renal trauma occurs in approximately 1–5 percent of all trauma cases, with a 3:1 male-to-female ratio, and in all ages of patients. Blunt trauma is the leading cause of injury, with motor vehicle accidents accounting for nearly half of those injuries and falls, sports, and assaults reported as the mechanism for the majority of the remaining blunt trauma. Penetrating renal trauma from gunshot wounds and stabbings is not common but tends to be more severe and less predictable.

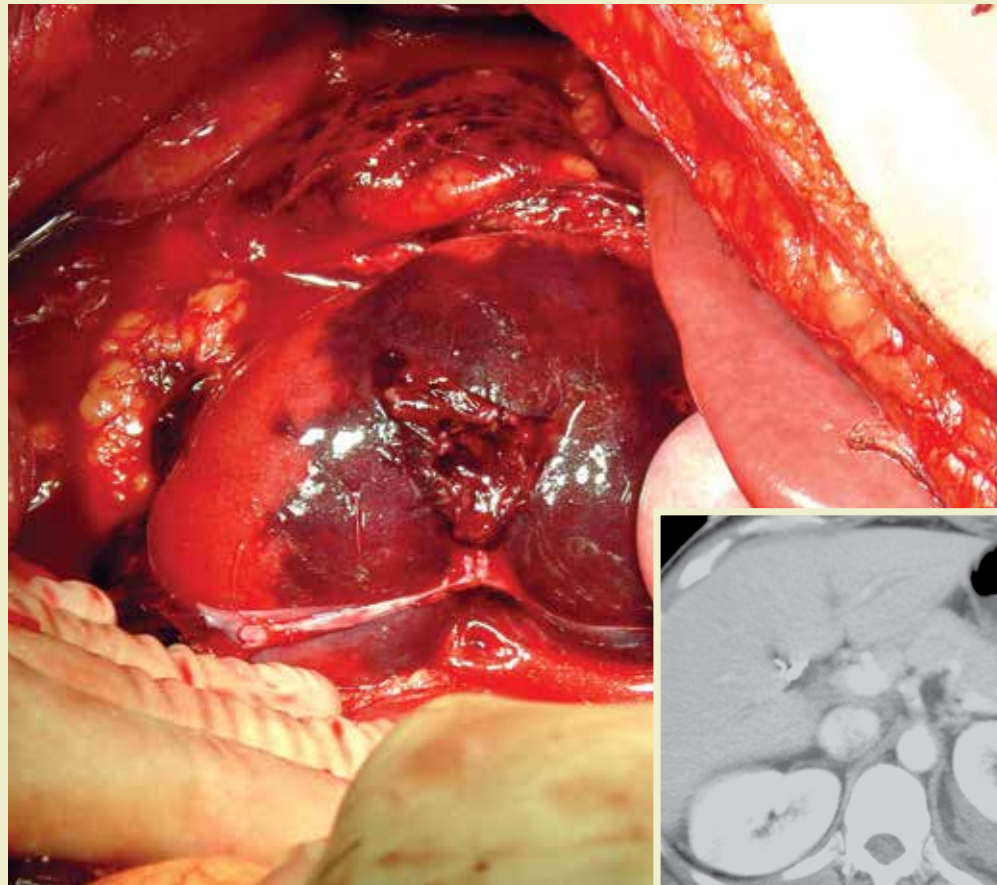
Blunt trauma to the back, flank, lower thorax, or upper abdomen—particularly with associated hematuria, ecchymosis, flank pain, abrasions, fractured ribs, or other signs of trauma—should raise suspicion of renal injury.

Grade A: Findings on physical examination, such as haematuria, flank pain, flank abrasions and bruising ecchymoses, fractured ribs, abdominal tenderness, distension, or mass, could indicate possible renal involvement.¹*

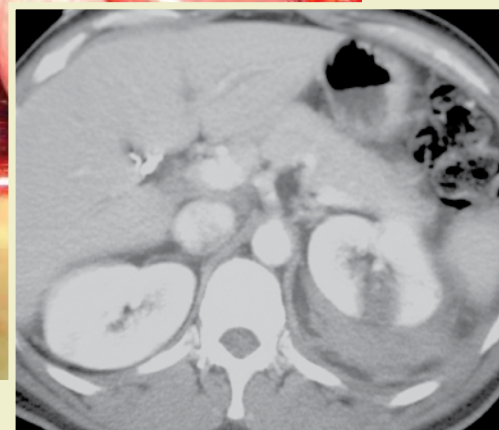
It should be emphasized that patients with a preexisting solitary kidney are at especially high risk of renal failure because injury to the single kidney may result in substantially reduced renal function.

Labs and Imaging

All patients with suspected or confirmed renal trauma should have a baseline creatinine measurement. In animal studies, serum creatinine was noted to remain normal for eight hours after bilateral nephrectomy. Therefore, most initial creatinine levels will reflect pre-



Renal fracture: intraoperative



CT of a left renal fracture

existing renal disease rather than new dysfunction caused by the trauma.

A urine sample should be inspected for both gross and microscopic hematuria, although this may not be a reliable indicator of trauma. One study demonstrated up to 9 percent of cases without hematuria were associated with major injury such as disruption of the ureteropelvic junction, pedicle injuries, and segmental arterial thrombosis.

Grade A: Urine from a patient with suspected renal injury should be inspected for haematuria (visually and by dipstick analysis).

Grade C: Creatinine levels should be measured to identify patients with impaired renal function prior to injury.¹

Although ultrasound can be used to identify lacerations and perinephric hematomas, computed tomography (CT) scans are more sensitive and specific. Angiography offers the added benefit of therapeutic embolization but is typically only used when there is a known injury with potential for hemostasis.

CT with intravenous contrast is necessary to assess for pedicle injury, which is indicated by a lack of contrast enhancement. If suspicion of pedicle injury is high or there are associated signs of injury, for example, hematoma or free fluid, delayed CT scans should be performed 10 to 15 minutes after contrast injection to assess for collecting-system injury that can be missed using a routine CT imaging protocol.

Grade A: Blunt trauma patients with visible (gross) or non-visible haematuria and haemodynamic instability should undergo radiographic evaluation.*

Grade B: Immediate imaging is recommended for all patients with a history of rapid deceleration injury and/or significant associated injuries.

Grade A: All patients with or without haematuria after penetrating abdominal or lower thoracic injury require urgent renal imaging.*

Grade C: Ultrasound alone should not be used to set the diagnosis of renal injury since it cannot provide sufficient information. However, it can be informative during the primary evaluation of polytrauma patients and for the follow-up of recuperating patients.

Grade A: A CT scan with enhancement of intravenous contrast material and delayed images is the gold standard for the diagnosis and staging of renal injuries in haemodynamically stable patients.¹

Overall, the “Guidelines on Urological Trauma” from the European Association of Urology offer a nice review and interpretation of the current literature. The key take-home points are:

- Suspect renal injury in the presence of blunt trauma or evidence of injury near the patient’s flank along with gross or microscopic hematuria.
- CT is recommended as the initial imaging modality if kidney injury is suspected.

An initial creatinine elevation is more likely to represent preexisting renal function impairment rather than indicate acute kidney injury caused by the accident. ➔

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DR. PIERCE is a new attending at St. Thomas Rutherford Hospital in Murfreesboro, Tennessee. He wrote this article as the 2014–2015 EMRA representative to the ACEP Clinical Policies Committee while finishing residency at the University of Virginia.

PROS & CONS: DOES SIZE MATTER? | CONTINUED FROM PAGE 1

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noun de·moc·ra·cy \di-ma-kre-se\



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Dighton C. Packard, MD, FACEP, chief medical officer of EmCare in Dallas

RM: Does being a democratic group have associated with it both positive and negative obligations and responsibilities that we don't talk about much?

NJ: We're a group that's been around for almost 40 years, we staff one health system, everyone has a vote, and everyone is treated equally. This conversation has been brilliant because I think everyone has brought up the exact same issues that really are facing the specialty and the people involved. I do believe that a small group can have the chops to do things, and in our group, everyone pitches in. Everyone doesn't do the exact same thing, but everyone

does a comparable amount of work, just different work. I get tasked to run the show and my program director gets tasked for most of the academics because we do staff one of the oldest residency programs in the world. We don't get treated seriously because I can't walk into a payer the same way Lynn, Dighton, or Wes can; they can get a lot more leverage out of it than I can. I pretty much go in and do as I'm told, so that's a fault for the system. There are certain things that, for a democratic group, make no sense whatsoever. An example from our particular group is we once had a 30-minute discussion about what color scrubs we were going to wear because

everyone had to vote. That's a complete waste of time. We're also facing something that is being attributed to being generational, and I don't know if that's fair or not, but we're seeing more and more people graduating from medical school and residencies who have no interest in doing what Wes, Dighton, Lynn, and I do every day. They want to see patients and go home. They don't want to have ownership. They just want to get a paycheck, and that's neither good nor bad, but it makes it very difficult for a group like mine that relies on people to have individual incentives to step up to the plate to work the extra shifts, to write a check to cover the capital costs. People

aren't interested in doing that, and I think that is more of a danger than anything to the democratic group than anything else. I think we're facing a generational change at the same time that the regulations, obligations, and accountability, as outlined by Lynn, are there, so it's a mismatch that's going to make this particular model an endangered species.

SB: There's a very large difference among democratic groups. They don't all fit in one shape or size, and it is a very diversified space, just like how groups that aren't democratic are extremely different in terms of

CONTINUED on page 8

structure, resources, and location. I think that it would be a shortcoming of our discussion to just talk about the smaller, independent democratic practices that still exist because there are regional and national democratic practices that also exist. I think they address some of the very real challenges that Lynn has alluded to. I think that practice integration and meeting the standards for our hospitals in terms of population health are very difficult if you are a one service line, single, independent institution. However, democratic organizations have greatly evolved into various practice lines so that they can meet the challenges of the current health care environment and continue with their structure. Being treated fairly is an admirable starting point for many young emergency medicine doctors, but equity is a prized possession for emergency physicians. If you're able to maintain your equity and diversify your deliverables so that you can meet the expectations of your hospital, well, that's great, but there are significant pressures that are forcing the smaller democratic and nondemocratic independent practices to look at other options. However, I think that many of these single, independent places believe that being democratic is the problem when it's really a lack of diversification and economies of scale that are the problem, and we shouldn't mix those two together. There are plenty of single, independent groups that are in a good place and have great relationships that can keep on going for "X" period of time. I think that eventually the health care environment will show its cards, and you will see, from different regions of the country, those pressures will either make these independent democratic practices look for other options or be able to remain viable.

NJ: I agree with that. It is a matter of scale more than anything else. I think docs are smart enough that they can run a business if they have to, but many are choosing not to, unless you're big enough to be able to compete and win.

RM: What are the pros and cons of the democratic group versus nondemocratic group as we see the market consolidate, not only to take on risk but also to move toward population health? Do we see pros and cons of the different models?

WF: One of the long-running experiments with CEP America is whether or not a group that's equity-based and where ownership is really strategic in terms of deliver-

ing high-quality clinical services, integrating well, expanding across practice lines or medical specialties and across different regions and markets can succeed while operating privately and not accepting outside investment or being tied to short-term financial demands or requirements in order to access capital markets. For us, a culture of ownership, a culture of caring, and the long-term commitment to satisfying careers essentially mean that each of our partners is also our investment banker. What we believe to be important is that this allows us to

it's not so much that we're a democracy that makes us likely to be one of those winners that Lynn was talking about but that we have the ability to think long term and to be able to operate privately and still achieve scale, have success with integration, and have our model make as much sense for anesthesiologists or physicians practicing in nursing homes as it does for PIT doctors in the emergency department. We think all those things are important; we see it as an incredible challenge, and it gets tougher every day. One of the features of many suc-

I think that eventually the health care environment will show its cards, and you will see, from different regions of the country, those pressures will either make these independent democratic practices look for other options or be able to remain viable.

—Savoy Brummer, MD, FACEP

One of the features of many successful long-term investors—Warren Buffett is a classic example—is the ability to be patient, methodical, principled, and think long term.

—Wesley Fields, MD, FACEP

Perfection is in the eye of the beholder. What works for one graduate is inappropriate for another, and this idealized vision that you're going to get to vote on everything or get 100 percent bonus every single day just doesn't exist.

—Nicholas J. Jouriles, MD, FACEP

make strategic plans that are long term in nature, and we're not at the mercy of a culture, which you actually see in many small democratic groups, where it's me here and now, "What's my hourly? What's my paycheck? What's my bonus this year?" I think the way individual groups, with all kinds of structures, think about ownership, equity, and investment within each other and their community is really crucial. I think that's what Nick is pointing out and, in his own way, Lynn as well. Our belief in CEP is that

successful long-term investors—Warren Buffett is a classic example—is the ability to be patient, methodical, principled, and think long term. One of my favorite quotes from Warren is, "If you want to get rich, it's better if you're not in a hurry." The other I'll throw in is that I still think in many ways Winston Churchill was right when he said, "Democracy is the worst form of governance possible except for all the others." I think partners like Savoy and I, with all the challenges we face inside CEP, believe that. Every day is

a challenge for us to demonstrate that it's still true that democracy is the best way forward.

LM: Investing can mean a lot of things. Investing can mean spending money on physician leadership development. Investment can mean spending money on risk-management programs that aren't really going to save you money until one, two, or three years down the road. Investment could be IT investments, which increasingly all of us are having to make or are choosing to make because we don't want to have to wait for the hospital or the payer to tell us how well or how badly we're doing in a particular area. I think groups of many different kinds can make those investments. Envision and TeamHealth are both public companies, and sometimes there may be the perspective that it must be all about this quarter. Well, I can tell you, and I suspect Dighton can tell you, we invest a boatload of money that's not going to generate anything except a negative in a given quarter in service of having a better organization for the long term. I'm confident that groups like CEP make those same kinds of investments in people, education, risk management, and IT. I suspect none of us enjoys some of those investments in terms of the costs, especially in IT. It's hard even for a highly motivated, smaller democratic group to make those same investments. Perhaps that's why some of those smaller democratic groups are coming together and coalescing in some interesting ways. There are a lot of issues here about democracy and scale. I just don't think even a democratic group can afford not to invest in somebody in that group spending a disproportionate amount of time thinking about the business side of the business. One of the sisters here, years ago when the sisters were actually running the hospital, said to me, "There is no mission if there is no money," and it's OK to talk about the money sometimes. Whether it's managed care contracting or investing in IT, every one of us has to be thinking about making some of those long-term investments, and it's just harder in some places than others.

NJ: I think it's ironic that we're all saying many similar things. Wes, sorry we're not as smart as you out there on the West Coast. You eloquently quote smart people; we quote rock and roll. To me, it's, "You can't always get what you want." Even with my residents, I talked to them just this morning about getting jobs when they finish in June, and everyone has this idealized vision that

they have to get everything exactly perfect. The reality is it doesn't exist. Perfection is in the eye of the beholder. What works for one graduate is inappropriate for another, and this idealized vision that you're going to get to vote on everything or get 100 percent bonus every single day just doesn't exist. There are a lot of requirements regulatory and otherwise now, much more than when I started. The practice is much more complex than it ever was, and it's not going in the other direction; it's going to get even worse. You have to spend an inordinate amount of time dealing with non-patient care issues to get the practice working, and a lot of people just don't want to do that. They have to come to the realization that you're not going to get everything. There are going to be trade-offs in your practice, and we need to accept that.

SB: I would agree. I think in most democratic groups there are fiduciary duties to respect the needs of the individual physician, but there are also duties to respect the needs and desires of the aggregate, and that can manifest itself in different ways. But ultimately, I think that a democratic practice attracts a special type of personality and a special type of physician. Clearly, there are sacrifices, and as long as we can define a democratic model and define the option that these young resident have when they go out into the workforce so that they truly understand what not only an idealized view of a democratic practice is but give actual working examples that are out there, I think that they can weigh all of the risks and benefits on their own.

RM: How we're getting paid is changing, and we've not touched on that. The transition from fee-for-service toward a value-based system does take investments, changing organizations, growth of IT that can support it, and the ability to take on risk. What we're seeing are a lot of independent practices in other specialties rolling up and forming new organizations, and they're having to give up some of their autonomy as small, independent practices in order to gain market position in order to be able to take on risk. They're also partnering with nonphysicians. They're partnering with health systems to create new entities. How do we see that transition affecting what might be the best approach to organizing in emergency medicine? Do we continue to say we're going to be ourselves, or do we move forward and join these consolidations? What do you see

Now, those of us that are large organizations, we believe in economies of scale, but most of us acknowledge that there are diseconomies of scale [forces that cause larger firms and governments to produce goods and services at increased per-unit costs], and there are some bureaucracies that all of us would like not to have.

—Lynn Massingale, MD, FACEP

happening there, and how will that affect autonomy and democracy?

WF: That's a really fascinating topic. Jeff Selevan is a good friend of mine, and he recently retired as the CFO of Southern California Permanente, which in its own right is a democratic partnership. It has 8.5 million members just in California. Jeff has said that consolidation is not integration, and I really, really think that's true. One of the things that we will agree on is that we see a better future for health care and a better shot at achieving the triple aim with physician-driven cultures of care. I think the most important spirit of democracy, if it still matters, is one that results in more effective teams and engagement with physicians and other providers. I think one of the things we probably all believe is that practice models that aren't pro integration, that aren't willing to integrate and aren't willing to change, probably won't succeed. One of the dangers of democracy, especially on a smaller scale, is that if all you're concerned about is the rights of individual partners or providers, and all they're concerned about is voting their own self interest, you're not necessarily going to get there.

SB: The irony here is that by having so much consolidation we're going to end up with a bunch of big practices. Not all of them are going to succeed, and some are going to have so much bureaucracy, they're actually going to fail because of their size. I think what's going to happen in the industry is we're going to have a whole bunch of consolidations. We're going to have a few really, really big people doing really well; a bunch of people in the middle not doing well; and some smaller groups that were actually small enough, facile enough, and nimble enough that they can outmaneuver everyone. You either have enough size that you can keep your costs down, or you're going to be fast enough to take care of the

patients quickly and efficiently so that you can make money that way. The people in the middle are going to do terrible.

LM: To that point, Jack Welch famously took the position during his tenure at GE that if he couldn't be number one or number two in a particular market, then he didn't need to be in that market. He later said that had been a serious error, that he had missed lots of opportunities to have lots of good businesses and divisions of

GE that could have been very, very successful and very competitive. Now, those of us that are large organizations, we believe in economies of scale, but most of us acknowledge that there are diseconomies of scale [forces that cause larger firms and governments to produce goods and services at increased per-unit costs], and there are some bureaucracies that all of us would like not to have. We obviously think that the advantages outweigh the disadvantages, and I don't think any of us—at least I surely don't—think that this is the only way to do it. I think what you said is right: there are going to be lots of ways to skin a cat. But I don't think you can do just what you always did and have your head in the sand about the changes that are occurring around us and still succeed. Whether you're a single hospital group, regional group, democratic group, or a publically traded group, you just can't be complacent about that.

NJ: And the key to that is you have to invest the time and energy and the resources to make those changes. If you decide not to make that investment, you're going to lose. ☛

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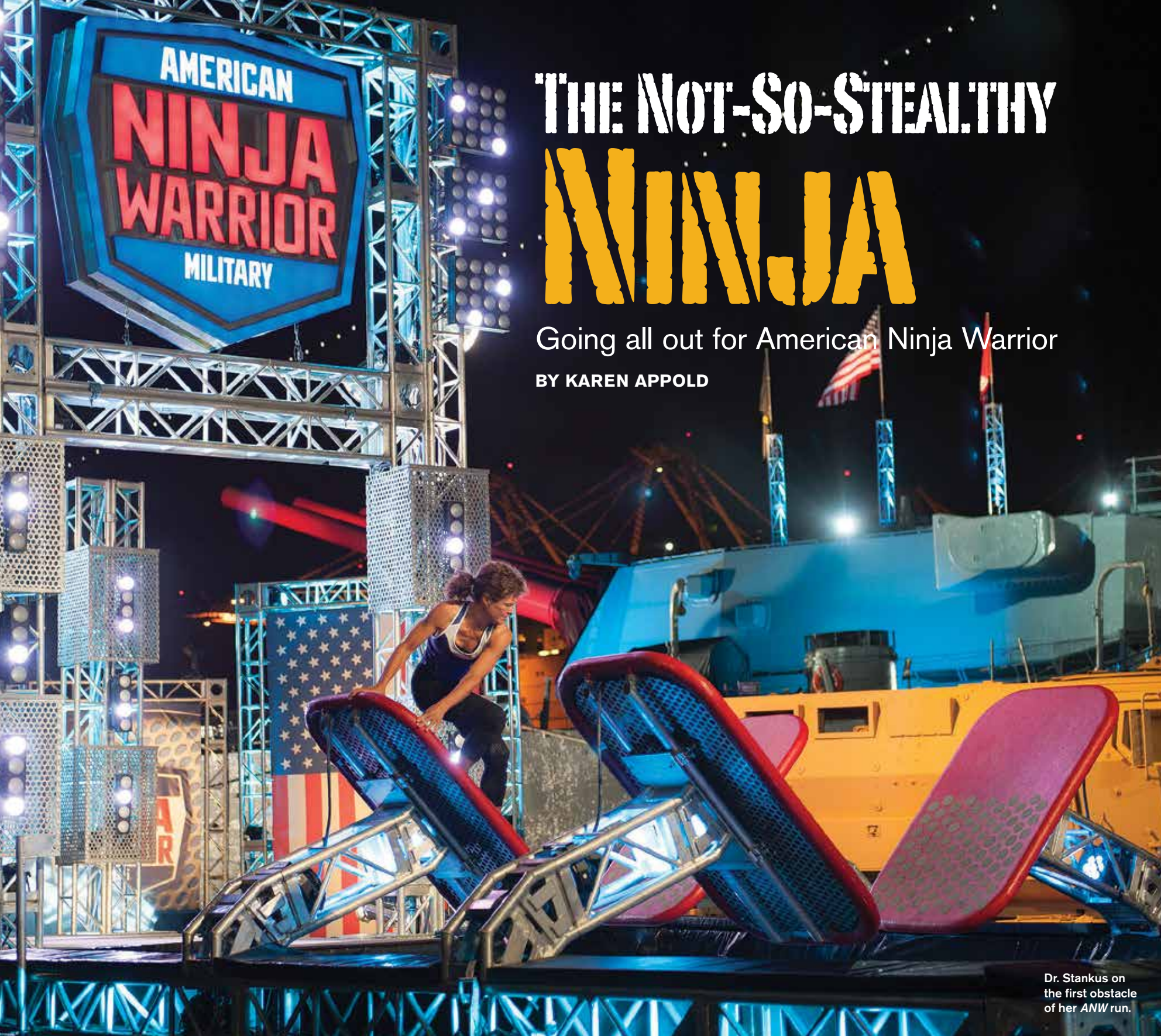
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THE NOT-SO-STEALTHY NINJA

Going all out for American Ninja Warrior

BY KAREN APPOLD

Dr. Stankus on
the first obstacle
of her ANW run.

RYAN TUTTLE/ABC

JENNIFER L'HOMMEDIU STANKUS, MD, JD, is always looking for a challenge. “When I saw [NBC’s] *American Ninja Warrior* [ANW], it looked like so much fun that I had to try out,” she said.

The avid sports enthusiast, who works at Tacoma Emergency Care Physicians and Madigan Army Medical Center, both in Tacoma, Washington, is no stranger to testing her limits. “I participate in tons of sports and outdoor activities, including cave diving, rock climbing, mountaineering, skiing, surfing, and running, among other things,” the 45-year-old athlete said. She’s even competed in national Xterra off-road triathlons. “But nothing can really prepare you for ANW other than being a well-rounded athlete,” Dr. Stankus said.

STIFF COMPETITION

Dr. Stankus, who served as an officer in the US Army’s Judge Advocate General’s Corps and as a medic in the US Navy Reserve after high school, was selected from 50,000 applicants vying for fewer than 700 spots on ANW. She competed in a special military edition in San Pedro, California, in June this year. Contestants on the show compete in one of six cities, with 15 finalists from each city going on to the national finals in Las Vegas. The winner, if there is one, is awarded \$1 million.

The competition runs from dusk until dawn. The first night is the city qualifiers, where a pool of 110 is pared down to 30. The city finals are held the second night on a longer and

more difficult course, cutting the field down to 15. The course consists of a series of obstacles that test strength, speed, balance, and agility.

“Very few people finish the course, but anyone who finishes, regardless of time, moves on to the finals,” Dr. Stankus explained. Those who go the farthest fastest fill the remaining slots.

FINDING BALANCE BETWEEN WORK AND PLAY

So how does Dr. Stankus balance her training regimen with her professional responsibilities? “I work hard and play hard,” she said. “When I’m done at work, I’m done, and that’s when the play starts.”

Staying fit is a lifestyle, said Dr. Stankus, just like getting a good night’s sleep. She does daily cardio exercises, such as running, swimming, biking, or hiking. For strength training, she focuses on pull-ups, push-ups, dips, planks, jumps, and other body-weight and core exercises, plus works out on an obstacle course that she created at home. “Your body gets conditioned to the same exercises pretty fast, so you have to keep mixing it up,” she said. She can achieve desired results by working out between 20 and 45 minutes four to five times per week.

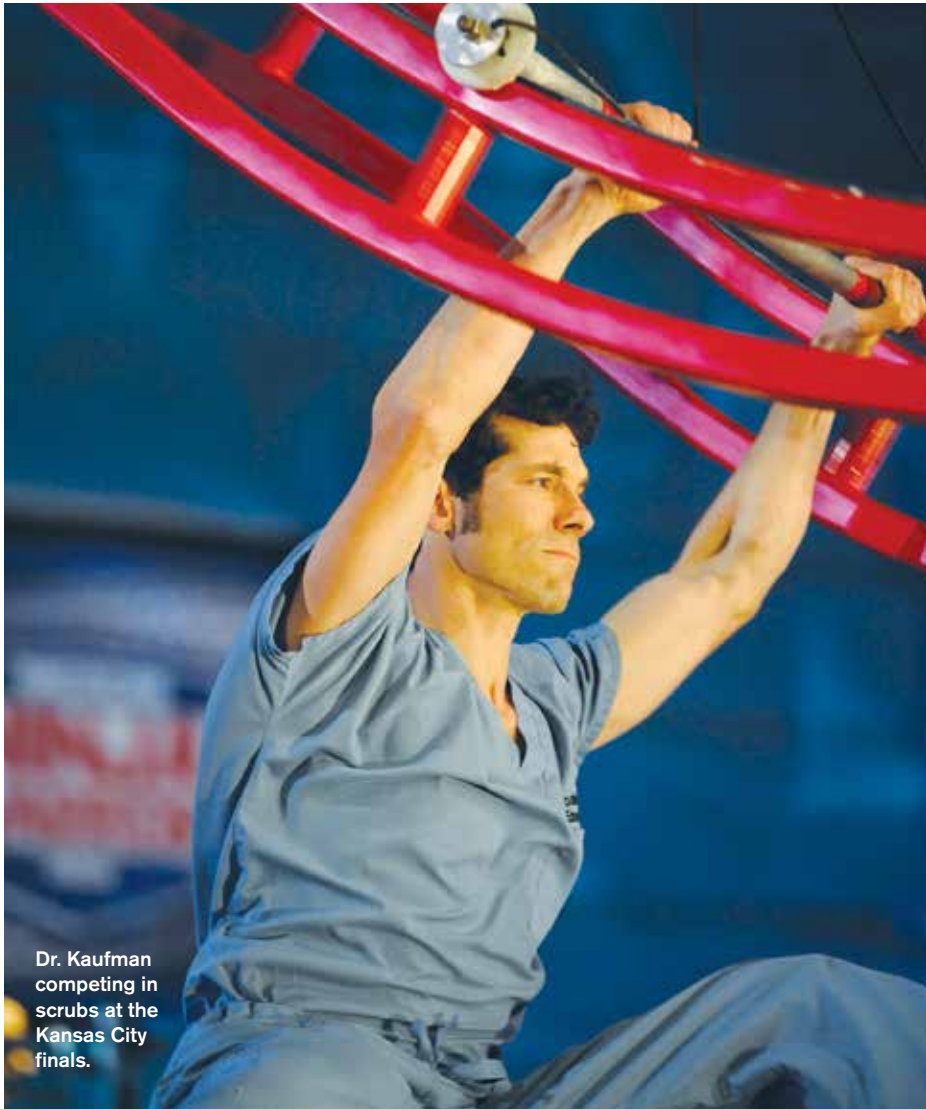
Dr. Stankus, who is 5’5” and 114 pounds, has sworn by a vegan diet ever since reading *The China Study* by T. Colin Campbell, PhD, and

Dr. Stankus prepares for a trampoline jump.

RYAN TUTTLE/NBC

“It is a bit intimidating to be on national television with a big audience, cameras, and lights in your face while facing obstacles you never tried before. Keeping a positive focus and calm nerves is important.”

—Jennifer L’Hommedieu Stankus, MD, JD



Dr. Kaufman competing in scrubs at the Kansas City finals.

FERNANDO LEON/NBC

Thomas M. Campbell II, MD, in 2006. “If you eat a whole-food plant-based diet while limiting fats, you will get all the nutrition you need and nothing you don’t,” she said. “You don’t have to count calories or think about glycemic indexes, and the idea that carbs are a bad thing is insane! Such a diet supports good health, prevents disease, and allows you to reach optimal athletic performance.”

Indeed, Dr. Stankus has a lot on her plate, as she is actively involved with ACEP as chair of the medical-legal committee and as a member of the board of directors of Washington Chapter ACEP. She also serves on the ACEP Now editorial board, is a reviewer for *Annals of Emergency Medicine*, serves as an ACEP Councillor, and contributes to multiple task forces, among other duties. She was also featured—to her surprise—at ACEP15 last month when the opening session speaker, Mark Scharenbroich, called her to the stage to talk about her Harley Davidson Softail Slim motorcycle.



The trampoline and net from Dr. Stankus's home training course, which she designed and built.

EARNING A SPOT

To get on the reality TV show, Dr. Stankus created an audition video that showcased her athletic abilities while presenting an interesting story. But she is actually not the first emergency physician to compete on ANW. Noah Kaufman, MD, an attending emergency physician at Emergency Physicians of the Rockies, University of Colorado Health Systems in Fort Collins, is in his third season of the competition.

“I wanted a larger platform to motivate people to get healthier,” said Dr. Kaufman, who is 6’2” and 180 pounds. “They call me the ‘ninja doc,’ and I have inspired a ton of people to quit smoking and lose weight; it feels really good. Viewers are constantly communicating with me about their health goals and progress via social media.”

To date, the 40-year-old has made it to the Las Vegas finals twice, putting him in the top 1 percent of ninjas. Another highlight of his

experience was being the first emergency physician to reduce a fellow competitor’s dislocated shoulder on primetime television.

Reflecting on the event, Dr. Stankus said it’s most important to maximize your strength-to-weight ratio. It’s also important to be well rested since most competitors are awake for nearly 24 hours before their run. “It is a bit intimidating to be on national television with a big audience, cameras, and lights in your face while facing obstacles you never tried before,” she admitted. “Keeping a positive focus and calm nerves is important, but I’m used to that as an emergency physician.”

Dr. Kaufman also sees commonalities between being a ninja and an attending emergency physician, such as working under pressure, dealing with many personalities,

and working in the middle of the night.

Unfortunately, Dr. Stankus will not advance to the next round this year. She expects it will take several years of training and competing before being successful, as has been the case with many other competitors. She plans to reapply to be on ANW next year and believes her chances of being selected are good since previous competitors are often chosen again.

“I eventually expect to make it to the Las Vegas finals because I don’t give up until I reach my goals,” she said.

Follow Dr. Stankus on Twitter at @JenniferStankus and Dr. Kaufman on Twitter at @climberdoc and on Instagram @boulderdoc. ➔

KAREN APPOLD is a medical writer in Pennsylvania.

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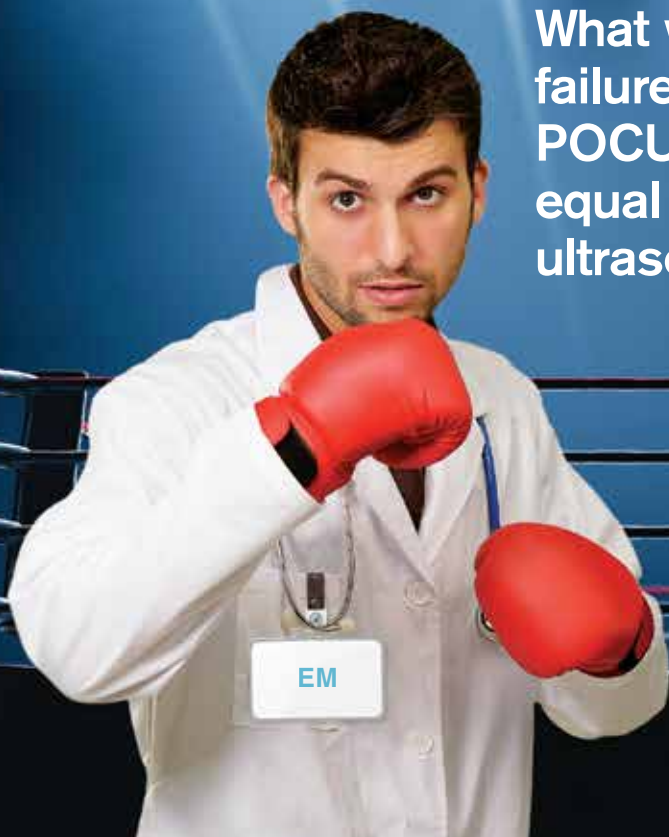
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EPs Under Fire for POINT-OF-CARE PELVIC ULTRASOUND

What we have here is a failure to communicate: POCUS does not equal formal radiology ultrasound



BY JOHN BAILITZ, MD, FACEP, ROBINSON M. FERRE, MD, FACEP, RAJESH N. GERIA, MD, FACEP, RESA E. LEWISS, MD, FACEP, JASON T. NOMURA, MD, FACEP, FACP, CHRISTOPHER C. RAIO, MD, MBA, FACEP, GUY TARLETON, MD, FACEP, AND VIVEK S. TAYAL, MD, FACEP, ON BEHALF OF THE ACEP ULTRASOUND SECTION

"I am proud of our program and have commended my physicians for embracing the amazing potential of POCUS. I am disappointed the program was cast into a disparaging light but have learned that evolution and change will always be scrutinized by the status quo."

—Guy Tarleton, MD

Emergency physician–performed (EP) pelvic ultrasound has been shown to save lives, expedite patient care, and improve patient satisfaction. The 2001 and 2008 ACEP Emergency Ultrasound Guidelines define pelvic ultrasound as a core application for the assessment of the first-trimester patient presenting with vaginal bleeding or abdominal pain. Despite this, AuntMinnie.com, an imaging website, recently published an interview questioning the utility of EP pelvic ultrasound.¹

The news article highlighted a fundamentally flawed research abstract presented at a national radiology meeting. The study was a retrospective review of 75 patients at Santa Barbara Cottage Hospital in Santa Barbara, California, who received an EP pelvic ultrasound followed by a consultative ultrasound in radiology. When study results were dichotomized into positive or negative, the EP pelvic ultrasound was reported to be 74 percent sensitive and 90 percent specific compared to the consultative ultrasound in radiology. As expected, 24 percent of the focused EP pelvic ultrasound

diagnoses did not match those reported in the comprehensive radiology reports. Examples included studies that were diagnosed in the ED as "no intrauterine pregnancy (IUP)," followed by a radiology ultrasound that diagnosed the presence of an ectopic pregnancy.

The emergency ultrasound director at the institution, Guy Tarleton, MD, commented, "I interviewed the principal investigator of the study, and I learned there was little knowledge or appreciation of the goals of point-of-care ultrasound [POCUS] in the ED. The studies were judged against radiology department–specific standards set by the American College of Radiology [ACR]. Those standards mandate a comprehensive and detailed sonography of a given organ system or body part. The ED studies were lumped into a 'misclassification' category when they fell short of ACR comprehensive standards but clearly met or exceeded our goals for first-trimester ED POCUS. I am proud of our program and have commended my physicians for embracing the amazing potential of POCUS. I am disappointed the program was cast into a disparaging light but have learned that evolu-

tion and change will always be scrutinized by the status quo."

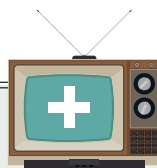
The study investigators failed to acknowledge that staged imaging with an EP pelvic ultrasound followed by a radiology ultrasound is actually the appropriate use of both tests.

In a stable pregnant patient, if the focused EP pelvic ultrasound with a compact system reveals a viable IUP, no radiology ultrasound is necessary. The more complete examination must be performed by an appropriately trained individual, be it an emergency physician, ultrasonographer, or an ob-gyn consultant, if the EP pelvic ultrasound does not reveal a viable IUP. A comprehensive consultative ultrasound in radiology with a cart-based system would be indicated. In the unstable pregnant patient, if the EP pelvic ultrasound reveals significant free fluid in the abdomen in the absence of an IUP, emergent OB intervention is required. ⚡

Reference

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DR. BAILITZ is ACEP Ultrasound Section Chair Elect, director of the division of emergency ultrasound at Cook County Hospital in Chicago, and associate professor of emergency medicine at Rush University Medical School in Chicago. **DR. FERRE** is director of the emergency ultrasound division, program director of the emergency ultrasound fellowship, and assistant professor in the department of emergency medicine at Vanderbilt University in Nashville, Tennessee. **DR. GERIA** is clinical assistant professor of emergency medicine at Rutgers Robert Wood Johnson Medical School and faculty and ultrasound director at Brunswick Urgent Care in East Brunswick, New Jersey. **DR. LEWISS** is director of point-of-care ultrasound and associate professor of emergency medicine at the University of Colorado Hospital in Aurora. **DR. NOMURA** is director of the emergency ultrasound fellowship at Christiana Care Health System in Newark, Delaware. **DR. RAIO** is chairman of the department of emergency medicine at Good Samaritan Hospital Medical Center in West Islip, New York, and past chair of the ACEP Ultrasound Section. **DR. TARLETON** is emergency ultrasound director at Santa Barbara Cottage Hospital in Santa Barbara, California. **DR. TAYAL** is chief of the division of emergency ultrasound in the department of emergency medicine at Carolinas Medical Center in Charlotte, North Carolina.



Code Black Moves to the Small Screen

Emergency physician Dr. Ryan McGarry's documentary, *Code Black*, has grown into a TV drama

When *ACEP Now* last spoke with emergency physician and documentary filmmaker Ryan McGarry, MD, his film, *Code Black*, which chronicled life in the emergency department at University of Southern California Los Angeles County General Hospital, was receiving high praise on the documentary film circuit. Now, a year later, *Code Black* has made the jump from silver screen to television screens worldwide. CBS is currently airing a fictional drama series based on Dr. McGarry's documentary Wednesdays at 10 p.m. Eastern/9 p.m. Central.

Dr. McGarry recently spoke with *ACEP Now* Medical Editor-in-Chief Kevin Klauer, DO, EJD, FACEP, about the process of bringing *Code Black* to TV and the show's commitment to an honest and accurate portrayal of emergency medicine. Here are some highlights from their conversation.

KK: You've had some great developments, and it sounds like all that you wanted to happen really is beginning to happen.

RM: *Code Black* the documentary has now been made into a fictional drama series in primetime on CBS television and will be broadcast in about 60 countries worldwide. Early on, I had shot the documentary using some techniques that are usually reserved for fiction projects, and I hoped that we could turn this into something that could reach many more people, just as *ER* did some 20 years ago.

KK: It is amazing. I'm so excited for you. This has to go far beyond your expectations.

RM: It's not a stretch to say that lightning has struck twice. The documentary in its own right was truly a series of miracles. Doing a film during residency comes with challenges. To have the film be viewable, let alone award-winning, is one miracle. The second deals with this incredibly rare conversion from a documentary to network television. Veteran writers and veteran producers go to bat and pitch ideas every year. Each network hears about 1,000 pitches. From the 1,000, they buy about 100 to make into scripts, and from that short list, they green-light about 10 of those to actual pilot production. The script gets made into an episode. We came in as a 1 in 1,000 pitch and with odds of 2 to 3 per 1,000 are actually going to make it on the air. I really think it is fairly accurate to say that lightning has struck twice here.

KK: How many episodes do they commit to? Do they tell you, "We're going to do it for a whole season, we'll do two seasons, we're going to do a pilot of three episodes"?

RM: It's fairly standard for a full-season

order, which in network television is 22 episodes. We have our first order of 13 episodes.

KK: So how long does it take to get all those ready to go?

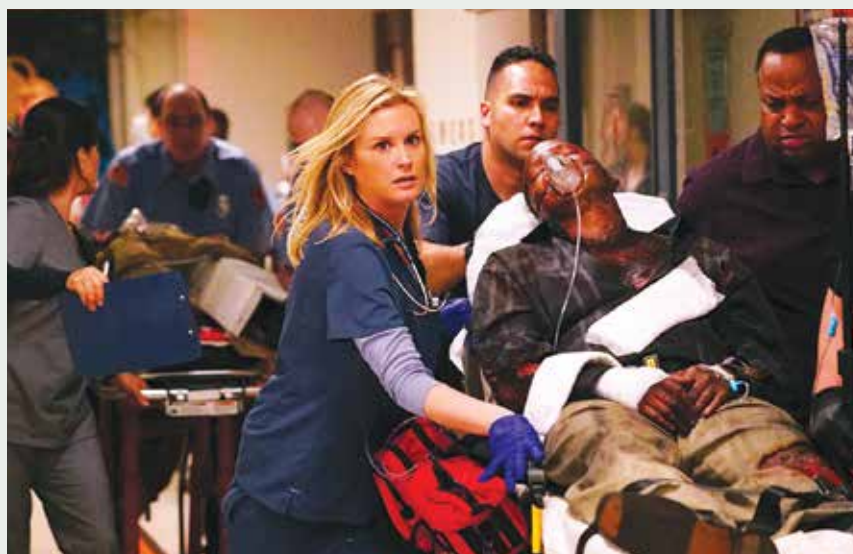
RM: If you can believe it, it's a four-ring circus. We're filming one, we're editing another, prepping another, and writing another. A

lot like emergency medicine, it's one thing to push your patients through the system, but it's quite another for them to leave that experience and say, "That was amazing!" That's what we're trying to do here.

KK: Glad you're still able to squeeze in six shifts a month. I agree. You don't want to close the door on your emergency medicine life, but you don't have much time for a personal life these days, do you?

RM: No. Simple answer, no.

KK: I remember you going through the fund-raising process and trying to make sure the documentary could actually be completed and that your return on investment was what you could provide in raising awareness for emergency medicine. But I have to believe when you get noticed and your idea gets picked up for a series, without asking you the details, I hope they're paying you properly for the work you're doing.



Scenes from the *Code Black* TV series.

PHOTOS: CLIFF LIPSON/CBS

RM: It is a game changer. The sad state of affairs, my friends and I joke, is that to get ahead on my medical school and educational debt, I had to sell a show to network television.

The academic quality of the show is pretty impressive. Each department has to be a student of medicine to get it right; we are unusually committed to authenticity. At one point, we cut basically raw footage of a chest tube trauma in a very high-stakes situation, and we just did an assembly cut, which means we did literally nothing to it, we just went clip for clip for clip of each step of that procedure. When we screened it internally with our docs here, they said, "I guess it's accurate, but it doesn't feel right." Interestingly, when we added in a tension-laden editing process, and we added in music, "Hollywood-ized" that documentary footage in a tasteful way, suddenly it felt right. At the end of the day, that's what we were after in this fictional series, and I think we're doing that successfully.

Many millions of Americans learn CPR, unfortunately, through television. This is a great example of how committed we are to authenticity. We have gone to the expense of crafting a customized fiberglass frame chest that goes over the actor when patients need CPR. It allows for us to really wail and do CPR from the shoulders with locked elbows as it's supposed to be. You see the chest recoil! Obviously, you can't do that on a real actor who didn't have that protection. If you're breaking ribs on a real actor, you've got a problem.

KK: Let me leave you with one thought. This year, two emergency physicians have done great things individually that have really positively impacted and elevated the status of emergency medicine. Steve Stack is the president of the AMA. You've taken a different path, within the same year, to expose what we do to others in a positive and more accurate light. The two of you, in two very different ways, have made this a monumental time for emergency medicine. We are so proud of both of you and grateful for what you've accomplished.

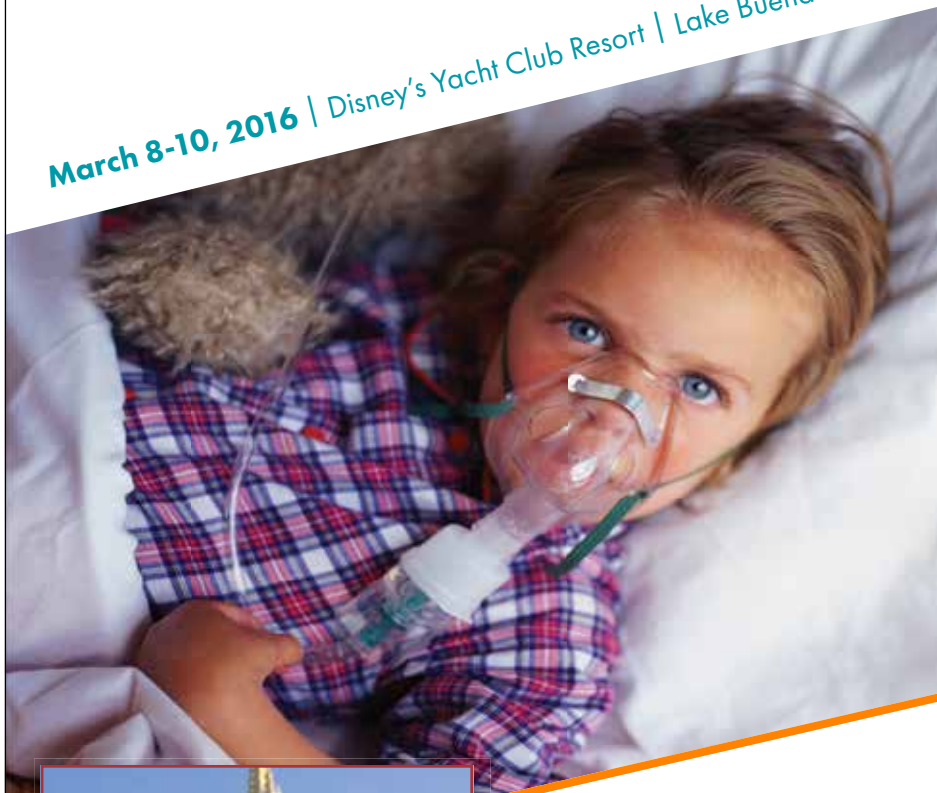
RM: That means a whole ton, and it's just the medicine I needed today. You would imagine that there is a mixed feeling when we see billboards and ads in L.A. and New York and everywhere in between about the show. It's a lot of pressure, and there's nothing like encouragement and belief when you're under a lot of pressure. I'm very appreciative of that. ☺

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THE WHITE WHALE | CONTINUED FROM PAGE 1



ament: radiology and emergency medicine. In radiology, the subsegmental PE is the culprit. As vessel size decreases, the quality of opacification and contrast capture diminishes. This results in consistent ambiguity regarding the presence of a flow-limiting lesion.

For example, a group of authors in Pennsylvania reviewed 415 images from their institution judged diagnostic for PE, focusing mostly on segmental and subsegmental PE.² Using five radiologists, four of whom were subspecialty trained in thoracic radiology, each image was individually re-reviewed. Based on their sample of 192 images read initially as segmental PE, a majority of authors could not agree on a positive finding in 5.7 percent of cases. For subsegmental PE, at least one reviewer dissented in 60 percent of cases. When compared with the original community radiologist's official read, the consensus was a false-positive rate of 3.6 percent for segmental PE and 15 percent for subsegmental PE.

A second radiology department, this time in Ireland, reviewed 174 CTs reported positive for PE.³ Three subspecialty-trained thoracic radiologists subsequently reviewed each of the studies read initially by one of 15 general radiologists. In this study, 45 (25.9 percent) cases were judged erroneously reported positive, including 26.8 percent segmental and 59.4 percent subsegmental. The authors reported the most common causes of diagnostic error were technical image-acquisition artifacts underappreciated by the general radiologists.

The authors offer a few specific suggestions relevant to radiologists to improve image quality and account for technical issues, but their primary complaint was simply this: we scanned too many patients who did not have a PE. After subtracting the patients with false-positives, yield in this study was 129 of 937, or 13.7 percent, falling at the low end of most published performance characteristics. This prompted another recommendation: the

best way to improve yields is to refer patients for scan only when they have a higher pretest likelihood of disease.

Referring appropriate patients for CT is, unfortunately, something we do terribly in the United States. A comparison of populations of patients evaluated for PE in several observational studies, with 3,174 patients in Europe and 7,940 patients in the United States, showed patients were reliably higher risk in European populations.⁴ Interestingly, this was most exaggerated in the clinical gestalt of treating clinicians: in Europe only a third of patients were thought to be low risk, while in the United States these totaled nearly two-thirds. The net effect in this study was an overall yield for PE of 28.1 percent in Europe compared with 7.1 percent in the United States. The PEs diagnosed in the United States were also generally less severe as stratified by the Pulmonary Embolism Severity Index, and PE-related deaths were likewise lower. The concise summary: we're performing astounding numbers of negative CTs and finding less significant disease, and it's almost certain our already-low numbers of positive results are further diluted by false-positives.

Using a validated diagnostic strategy, grounded in sound risk assessment, can reduce excessive testing. The fantastic Ali Raja, MD, leads a team that recently published updated American College of Physicians clinical guidelines for the evaluation of patients with suspected acute PE.⁵ These guidelines include most of the same strategies espoused in ACEP's prior guideline but now updated to include age-adjusted D-dimer.⁶ The age-adjusted threshold, age \times 10 ng/mL added to the generic 500 ng/mL in patients older than age 50, has been validated in multiple studies. Most recently, a review of a large cohort of Kaiser Permanente patients revealed a small handful of additional missed PEs, but the corresponding decrease in radiation exposure and contrast-induced nephropathy



ILLUSTRATION: PAUL JUSTRICH; PHOTOS: SHUTTERSTOCK.COM

As vessel size decreases, the quality of opacification and contrast capture diminishes. This results in consistent ambiguity regarding the presence of a flow-limiting lesion.

provided a net benefit.⁷ These authors did not account for the likelihood of false-positive CTs in patients with low pretest probability, and it is reasonable to suggest their study overstates the excess misses while understating the harm reduction.

Looking further at how our emergency medicine experts view the evaluation for PE, Jeff Kline offers a comprehensive summary of risk factors and diagnostic considerations.^{8,9} In his view, nonspecific cardiopulmonary symptoms are not sufficient in isolation to reasonably consider the possibility of PE. Patients must have physiologic manifestations of PE absent an alternative cause, paired with the presence of at least one known risk factor for PE. Risk-stratification into low, intermediate, or high risk can be performed by gestalt, Wells score, or revised Geneva score. Low-risk patients who meet the PE rule-out criteria fulfill an unfavorable risk-to-benefit ratio, and testing should be avoided. For otherwise low- and intermediate-risk patients, quantitative D-dimer testing is recommended.

Better yet, Kline has also proposed dynamically adjusting the D-dimer cutoff level based on the pretest probability.¹⁰ In a review of 126 patients diagnosed with PE, there were 11 patients for whom the pretest likelihood of PE was low and who had D-dimer levels less than 1000 ng/mL. All but one was subsegmental, representing less than 5 percent of the pulmonary vascular tree, and none had concomitant deep venous thrombosis. Accounting for the risks of anticoagulation, the increasing prevalence of false-positive CT pulmonary arteriography, and the risks of contrast-induced nephropathy, it may yet prove reasonable to forgo CT in this subset of patients. However, until better evidence becomes available, such a strategy should be approached via shared decision making, balancing the risks of small, undiagnosed PE against those associated with anticoagulation.

There is no question that widespread use

of CT has provided substantial benefit to patients and the health care system. However, its ubiquity and ease of use is leading to unintended consequences, particularly in overdiagnosis paired with substantial risks of unnecessary treatment. Every effort should be made to reduce use of CT in those with low pretest likelihood of PE, and small, subsegmental PE should be viewed with suspicion in the context of individual patient factors. We must continue to refine and reflect upon our routine evaluation of cardiopulmonary complaints, lest our pursuit of this white whale slip into madness. ☘

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The Hail Mary for Cardiac Electrical Storms

Go long, doctor! Really, really long!

by TERRANCE MCGOVERN, DO, MPH, AND JUSTIN MCNAMEE, DO

You are down by five, and there are only three seconds left in the game with 80 yards to go. Do you just take a knee or take a shot down the field with a Hail Mary since there is nothing else to lose? Similar to professional football players, we are professional “resuscitators.” When it comes to taking care of cardiac arrest patients, we cannot be limited to the playbook of advanced cardiovascular life support (ACLS). Occasionally, we, too, have to take a shot with our own version of a Hail Mary. Do we terminate the refractory ventricular fibrillation (VF) coding patient with an end tidal CO₂ of 27 mmHg, or is there a new “play” we can try before we pronounce the patient?

Case

A 43-year-old father of two presents to the ED via advanced life support (ALS) in cardiac arrest with a presenting rhythm of ventricular fibrillation. According to the transporting paramedics, the patient had a witnessed arrest at home, and the family performed CPR

until basic life support (BLS) arrived on the scene. An automated external defibrillator (AED) was immediately placed with “shock advised.” Two shocks were given by BLS prior to ALS arrival. The paramedics were able to intubate the patient and initiate ACLS. They report continued ventricular fibrillation, without return of spontaneous circulation (ROSC), from the time of arrival on scene until arrival in the ED. A total of 450 mg amiodarone, 5 mg epinephrine, two ampules of calcium chloride, two ampules of sodium bicarbonate, 100 mg lidocaine, and seven defibrillations were given prior to arrival in the ED. End-tidal CO₂ has remained around 25 mmHg with high-quality CPR performed in the prehospital setting. All eyes turn to you upon arrival. “Doc, what else can we do? There are no more steps on the ACLS card but more epinephrine and defibrillations. Should we call it?”

The Opponent: Electrical Storm

Electrical storm (ES) is described in the medical literature as a rapidly clustering ventric-

ular fibrillation that necessitates multiple cardioversions in which conventional antidysrhythmic drug therapy, as recommended by ACLS, fails to convert the patient to a life-sustaining rhythm. ES patients are commonly given antidysrhythmic medications serially while also receiving repeated shocks via an AED. However, despite heroic efforts made by all providers, most ES patients die.¹ Refractory arrest secondary to ES is not a new phenomenon in the medical literature. It has been studied and theorized for well over a decade. Most of the current literature agrees on one concept: an ES activates the sympathetic nervous system and, in turn, leads to a surge of endogenous catecholamines.² The abundance of endogenous catecholamines is likely the underlying culprit as to why conventional ACLS doesn't lead to ROSC in the majority of these patients. The ACLS algorithm for VF/ventricular tachycardia (VT) calls for 1 mg epinephrine to be given every three to five minutes; there isn't an asterisk next to this recommendation for patients in refractory VF arrest stating we should consider holding this medication or trying a different medication in our armamentarium. The addition of exogenous catecholamines in patients in refractory VF arrest or ES seems counterintuitive to what we know about this phenomenon. In fact, a better solution may be to give the patients a class of medications that suppresses the adrenergic surge they are experiencing, namely β -blockers.

The Hail Mary: Esmolol and Double Sequential External Defibrillation

A 2014 study in the journal *Resuscitation* retrospectively looked at patients in refractory VF arrest and compared those who received standard ACLS therapy against standard therapy followed by esmolol.³ Driver et al defined refractory VF arrest as patients with an initial presenting rhythm of VF or VT who received at least three defibrillation attempts, 3 mg adrenaline, and 300 mg amiodarone and remained in VF cardiac arrest upon arrival in the ED. In this *Resuscitation* study, a bolus of 500 mcg/kg (0.5 mg/kg) esmolol was administered followed by a continuous infusion of esmolol from 0–100 mcg/kg/hr (0–0.1 mg/kg/hr) to the study group, while the control group only received medications via the ACLS protocol. Of those in refractory VF arrest who received esmolol, 67 percent had ROSC compared to 32 percent in the standard therapy arm, and 50 percent of the esmolol group survived to discharge with good neurological outcome (CPC score <2) compared to 11 percent in the standard

Figure 2. Suggested treatment algorithm for refractory ventricular fibrillation arrest.

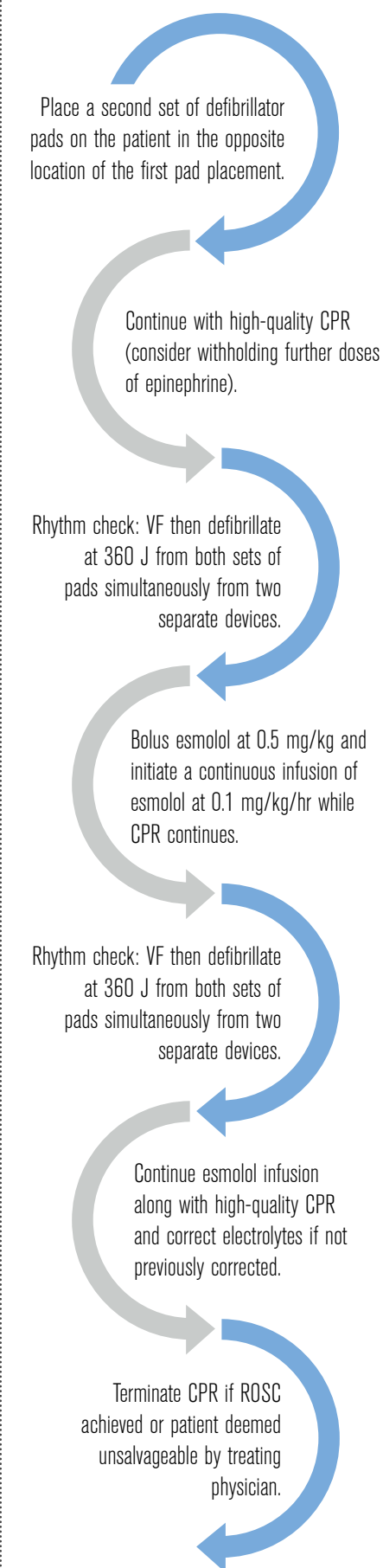


Figure 1. Orientation of defibrillation pads for double sequential external defibrillation: anterior-posterior (blue) and anterior-apex (pink).



therapy group. While this was a small retrospective study on refractory VF arrest in the ED, the results were in alignment with previous case reports dating back to the 1960s. Furthermore, studies not centered in the ED have used β -blockers for refractory ES, such as the Nademanee et al study in *Circulation* in 2000 and Miwa et al in 2010.^{1,3,4} The study results provide a measurable benefit in favor of using β -blockers to counteract the endogenous and exogenous (if given) catecholamine

surge theorized to occur during refractory VF arrest. Even though the current evidence for the use of esmolol in refractory VF arrest is far from concrete, it still far exceeds the evidence we have for other chemical agents to use on patients who do not respond to the traditional ACLS antidysrhythmics. However, the use of β -blockers may not be the only option and could possibly be used in combination with another piece of equipment readily available in the ED when the next refractory VF arrest presents to your ED.

age through one set of pads may not terminate the dysrhythmia. Hoch et al published a case series in 1994, "Double Sequential External Shocks for Refractory Ventricular Fibrillation," in which they utilized two sets of external pads placed in both universal pad placement areas to deliver simultaneous shocks to patients who were in refractory VF unresponsive to standard therapies while in an *electrophysiology* lab.⁵ They were able to terminate all the patients in the case series from VF into a perfusing rhythm by deliver-

ing double sequential shocks by means of two defibrillators, each with their own electrodes, one set placed anterior-posterior and the other set anterior-apex (see Figure 1). Prior animal studies using double sequential defibrillation suggested the sequential shocks lowered the threshold for defibrillation, improving the odds of terminating the rhythm. This concept was reintroduced to emergency medicine in 2015 with a prehospital retrospective case series published in *Prehospital Emergency Care* by Cabañas et al.⁶ They included 10 patients

with out-of-hospital cardiac arrest who had received at least five defibrillation attempts at 360 J along with standard therapy for refractory VF arrest in this case series. A second set of defibrillator pads was placed opposite the first set of pads, and on the next rhythm check, if shock was advised, the shock was delivered at 360 J from the new pad placement. If VF arrest continued, EMS utilized both sets of pads, and shocks were delivered from both machines as synchronized as possible. EMS providers were able to terminate ventricular

The New Playbook: Electrical Storm Treatment Algorithm

We suggest employing the following treatment algorithm (see Figure 2) when faced with your next refractory ventricular fibrillation cardiac arrest patient. For our algorithm, we define refractory VF arrest as at least 3 mg epinephrine, 300 mg amiodarone (or one dose of another antidysrhythmic), and three attempts of defibrillation with continued ventricular fibrillation. ⚡

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With very little downside of employing these interventions in refractory VF arrest patients, ED providers can try this Hail Mary to treat the patient's electrical storm.

Defibrillator pads are an easily accessible tool in any ED or ALS vehicle around the world and are placed within seconds of finding a patient in cardiac arrest. There are two universal locations for defibrillator pads to be placed: anterior-posterior or anterior-apex. When we approach a patient in cardiac arrest, the pads are positioned into one of these two positions. Defibrillation remains the mainstay of treatment for VF arrest, but in the rare incidence of ES with refractory VF arrest, the standard ACLS algorithmic approach of increasing volt-

ing double sequential shocks by means of two defibrillators, each with their own electrodes, one set placed anterior-posterior and the other set anterior-apex (see Figure 1). Prior animal studies using double sequential defibrillation suggested the sequential shocks lowered the threshold for defibrillation, improving the odds of terminating the rhythm. This concept was reintroduced to emergency medicine in 2015 with a prehospital retrospective case series published in *Prehospital Emergency Care* by Cabañas et al.⁶ They included 10 patients

fibrillation in 70 percent of the patients after double sequential external defibrillation (DSED), and 30 percent achieved ROSC in the field. Unfortunately, none survived to hospital discharge in this case series. However, they were able to gain ROSC in patients who were previously resistant to all other treatment strategies. What if DSED was combined with esmolol to counteract the sympathetic surge? The combination of both treatment strategies that are commonly available to all ED providers may provide some hope for these seem-

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Split for Success

Using split patient flow and an ESI 3 strategy to improve patient flow

by SHARI WELCH, MD, FACEP

Once upon a time, the emergency department was a single treatment room in the basement of a hospital. As utilization grew, the footprint of the ED grew, and by the 1980s, most EDs consisted of many rooms creating an entire department for urgent and emergent care. Emergency physicians discovered that patients with minor injuries could be treated and separated from the main department. With the right resources, patients could be treated and released in a more efficient manner by creating the “Fast Track” for high census times of the day. In the 1990s, emergency physicians at higher-volume centers found that some patients needed 24 hours to be adequately diagnosed and treated; the heyday for the ED observation unit began. These innovations were the tip of the iceberg, and performance-driven emergency departments have been experimenting with an array of models that segment patients into patient streams for more efficient health care delivery.¹⁻³ The Supertrack (for very-low-acuity patients needing no resources), the pediatric ED, the geriatric ED, the CDU (clinical decision unit), and chest pain units are examples of patient segmentation currently employed across the country.

The Raritan Bay Medical Center emergency department, with the support of Vincent Ciccarelli, MBA, BSN, ED nurse director, reinvented its intake process to quickly segment patients into appropriate areas within the department.

It is a fact: the world is watching the fishbowl that is the emergency department. Consumers, payers, and practitioners are intensely studying the Centers for Medicare & Medicaid Services’ emergency medicine performance metrics like OP-18 and ED-1a, capturing the length of stay of discharged and admitted patients, respectively. Also receiving attention is OP-20, the time from arrival to evaluation by a qualified medical provider. Here, too, we find a number of operational improvements emerging that improve the time it takes to see a provider (see Table 1).^{4,5}

This month’s column will focus on a real success story from an ED trying to improve its front-end operations. Geralda Xavier, MD, MPH, the medical director at Raritan Bay Medical Center in Perth Amboy, New Jersey, wanted to improve the intake process for the emergency department. She found what other medium- and high-volume EDs have discovered. They are having success and gaining efficiency by quickly assigning patients to different streams based on specific criteria. The Raritan Bay Medical Center emergency department, with the support of Vincent Ciccarelli, MBA, BSN, ED nurse director, reinvented its intake process to quickly segment patients into appropriate areas within the department. This expedited the time to see the physician or other provider.

The characteristics of the Raritan Bay ED are outlined below:

PERTH AMBOY	
<i>Beds</i>	36
<i>Annual volume</i>	47,000
<i>Admissions</i>	17%
<i>Length of stay discharged</i>	227 minutes
<i>Left without being seen</i>	3.2%

As with most EDs, the most difficult process involved the appropriate segmentation of Emergency Severity Index (ESI) 3 patients. Most EDs triage nearly half of their patients into this group, and it encompasses a vast array of chief complaints and acuities. The Perth Amboy ESI distribution follows:

ESI DISTRIBUTION	
<i>ESI 1</i>	0.4%
<i>ESI 2</i>	11%
<i>ESI 3</i>	43%
<i>ESI 4</i>	33%
<i>ESI 5</i>	7%

The Raritan Bay improvement team came up with a segmentation scheme that allowed some ESI 3 patients to remain vertical while others were placed in beds. The guidelines for the ESI 3 vertical and ESI 3 horizontal patients are in Table 2.

Patients arriving were quickly seen by a “pivot nurse.” A pivot nurse is an experienced nurse with extra training in assigning patients to the segmentation model. The patients with triage acuity 1 or 2 or horizontal 3 went to one area, the patients with

ESI indices of 4 and 5 and vertical 3 made up another stream. Patients were then quickly seen by a provider. Patients went to the area in the department with the appropriate resources for that patient.

Results:

	BEFORE	AFTER
<i>Door-to-Doctor Time</i>	45 minutes	28 minutes

The Perth Amboy ED team has a great success story to tell. But even more, they have given ED practitioners a model to experiment with for the patient segmentation and streaming of ESI 3 patients, our biggest and most diverse bucket of patients. This is cutting-edge ED operations. Bring it on! ☺

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Table 1: Operational Improvements to Reduce Door-to-Provider Time^{4,5}

- Advanced triage protocols and triage-based care protocols
- Bedside registration
- Dedicated Fast Track service line
- Full/surge capacity protocols
- Immediate bedding
- Incentive-based staff compensation
- Internal waiting area
- Kiosk self check-in
- Low-flow/high-flow process
- Palmar scanning
- Patient streaming/segmentation
- Personal health record technology (smart cards)
- Philadelphia EMS Admission Rule (PEAR)
- Physician cubicles
- Physician/practitioner at triage
- Recliner intake area
- Referral to next-day care (deferral of care)
- Resource-based triage system(s)
- Scribe program
- Self-populating triage tool
- Team approach patient care (Team Triage)
- Telemedicine triage
- Time-to-evaluation guarantee
- Tracking systems and white boards
- Triage pod
- Waiting room design enhancements
- Wireless communication devices

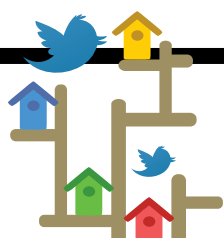
Table 2: Segmentation Scheme for ESI 3 Patients

ESI 3 VERTICAL

- Able to sit up
- Not in severe discomfort
- Not anticipating prolonged workup or procedure
- Nontraumatic flank pain
- Headache
- Pregnant with vaginal bleeding
- Vomiting/diarrhea needing hydration
- Back pain, ambulatory, minor mechanism, no fever
- Mild asthma
- Respiratory complaint with oxygen saturation >92 percent
- Chest pain <30 years of age without cardiac history, normal electrocardiogram
- Vaginal spotting
- Isolated extremity swelling
- Minor epistaxis

ESI 3 HORIZONTAL

- Needing to lay down
- Likely to be admitted
- Need for extensive fluids (>1 liter)
- Complex wound closure (needs plastics)
- Impaired (alcohol or drugs)
- Need for contrasted CT/imaging
- Abdominal pain
- Needs cardiac monitoring
- Short of breath, especially >50 years of age
- Weak and/or dizzy
- Gastrointestinal bleeding
- Syncope or near syncope
- Sickle cell patients



DR. FAUST is an emergency-medicine resident at Mount Sinai Hospital in New York and Elmhurst Hospital Center in Queens. He tweets about #FOAMed and classical music @jeremyfaust.

Free Open Access Medical Education Goes Mainstream

by JEREMY SAMUEL FAUST, MD, MS, MA

Free Open Access Medical Education (FOAM or #FOAMed) has always had a bit of a rebellious streak. The prototypical FOAMite enjoys ostentatiously taking on unproven dogma (ie, “received wisdom”), skeptically appraising seemingly sacred literature, and vociferously bragging about being an early adaptor. Now, however, some prominent FOAMites are going mainstream and showing up in some of medicine’s top peer-reviewed journals. At least some FOAMites are making the transition from health

care influencers to health care innovators.

The first famous example of this precedes even the coining of the term FOAM. Back in 2011, Richard Levitan, MD, FACEP (@airwaycam), and Scott Weingart, MD, FCCM (@emcrit), published their review of the concept of apneic oxygenation during preparation for endotracheal intubation, which they cleverly named NODESAT (nasal oxygen during efforts securing a tube), in *Annals of Emergency Medicine*. By the time the article was finally published, bloggers and online learners were well aware of its contents and were lauding the protocol as a simple, inexpensive, and ef-

fective intervention. However, this wasn’t a randomized, controlled trial.

This fall, an active FOAMite on Twitter became the first person to be first author in two separate prospective randomized controlled trials in two of medicine’s top journals: *The New England Journal of Medicine (NEJM)* and *JAMA*. The *NEJM* was the so-called HEAT Trial, “Acetaminophen for Fever in Critically Ill Patients with Suspected Infection.” This study showed that dosing ICU patients with 1 gram of acetaminophen when a fever >38°C was present did not change the number of days a patient avoided an ICU or mortality.

The *JAMA* trial, “Effect of a Buffered Crystalloid Solution vs. Saline on Acute Kidney Injury Among Patients in the Intensive Care Unit: The SPLIT Randomized Clinical Trial,” showed no difference in the incidence of renal replacement therapy (ie, dialysis) or mortality over 90 days in ICU patients who received moderate amounts of fluid (approximately 2 liters) regardless of whether that fluid was normal saline or buffered crystalloid.

Amazingly, both studies had the same first author, New Zealand intensive care physician Paul Young, BSc, MB ChB. Dr. Young, equally

CONTINUED on page 20

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known for his presence on Twitter (@DogI-CUma), his informative contributions to the emergency medicine mega-blog LifeintheFastlane.com, and his well-attended lectures this past June at the Social Media and Critical Care Conference in Chicago (#SMACCus), has set the bar high for budding FOAMites-researchers. Within hours of online publication, Twitter was abuzz with these new trials. In case you are wondering whether receiving social media attention increases a paper's influence, consider that in just the first few hours, the HEAT trial received some of the most Twitter attention in the history of the *NEJM*'s account. Is this isolated? Apparently not. At least two studies have shown that ar-

ticles that receive online attention are more likely to be influential than those that do not (another study found otherwise). This is a possible early indication of the death knell for the dominance of Journal Impact Factor as the primary arbiter of prestige in research. Back in 2005, Brody et al published data in the *Journal of the American Society for Information Science and Technology* showing that a higher number of downloads of a paper correlated to future citations of that article. Later, in 2011, Gunther Eysenbach, MD, MPH (@eysenbach), published findings in the *Journal of Medical Internet Research* suggesting that mere Twitter attention in the first few days after publication predicated which articles would go on to be-

come highly cited in future literature. More recently, proprietary products such as Altmetric have moved to monetize the idea that a combination of page views, downloads, tweets, and other forms of social media and online attention may more accurately reflect the impact of a particular peer-reviewed publication than previous metrics such as impact factor.

This comes as no surprise to me. At #ACEP13, Dr. Weingart informally polled his audience. How many people, he asked, routinely performed apneic oxygenation as part of their preintubation procedure because of his and Dr. Levitan's NODESAT paper? The vast majority of hands immediately went up. While this was clearly a select audience, the

point was made. How often could papers published even by the top peer-reviewed journal of our field, *Annals of Emergency Medicine*, expect to enjoy such wide and brisk translation from print to practice in the first two years after publication? The answer is very few. The fact that Dr. Weingart's EMCrit podcast is downloaded approximately 300,000 times per month and that he and Dr. Levitan combine for more than 26,000 Twitter followers may have something to do with that.

The ethos of FOAM continues to develop. While I hope it never sheds its freedom-fighter posture, it is a welcome development that FOAMites are becoming true thought leaders in emergency medicine and critical care. ☺

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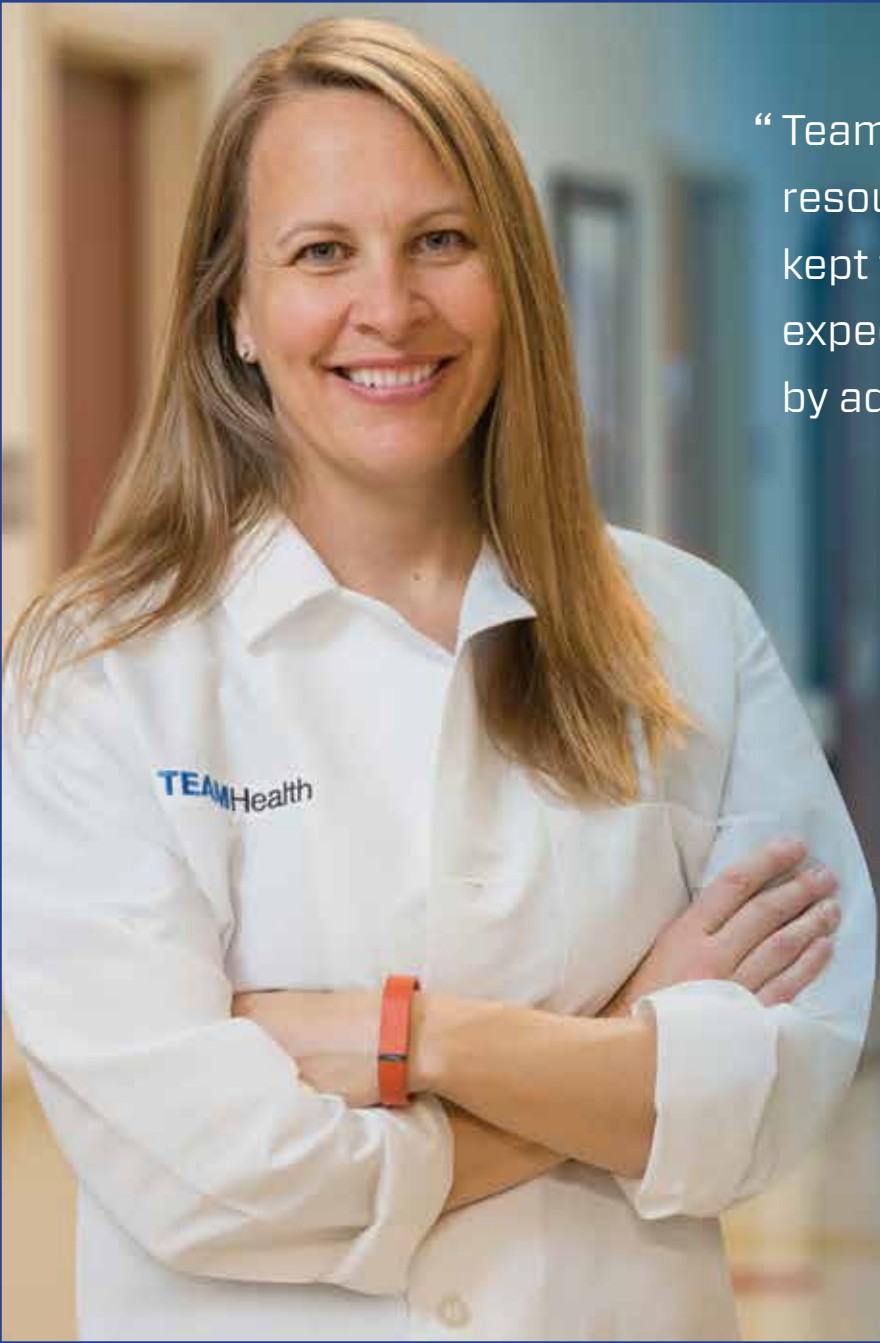
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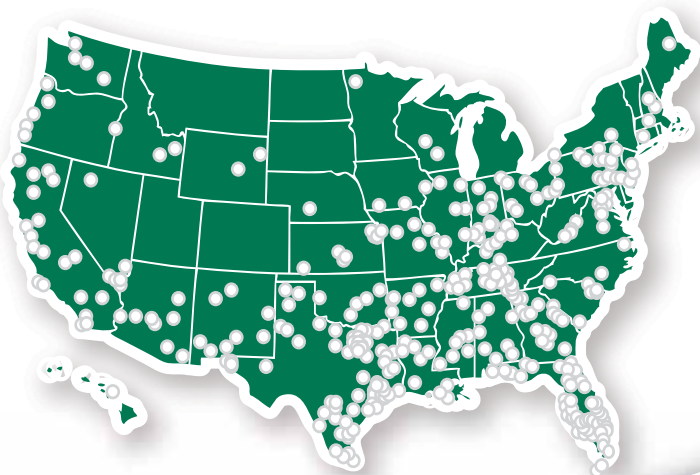
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(1) Outside County Nonrequested Copies Stated on PS Form 3541 (include sample copies, requests over 3 years old, requests induced by a premium, bulk sales and requests including association requests, names obtained from business directories, lists, and other sources)		3810	1790
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f. Total Distribution (Sum of 15c and e)		37847	37792
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h. Total (Sum of 15f and g)		39257	38297
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17. Publication of Statement of Ownership for a Requester Publication is required and will be printed in the November 2015 issue of this publication.	
18. Signature and Title of Editor, Publisher, Business Manager, or Owner Elizabeth Konkole, Manager, Financial Planning & Analysis	
Date 10/1/2015	

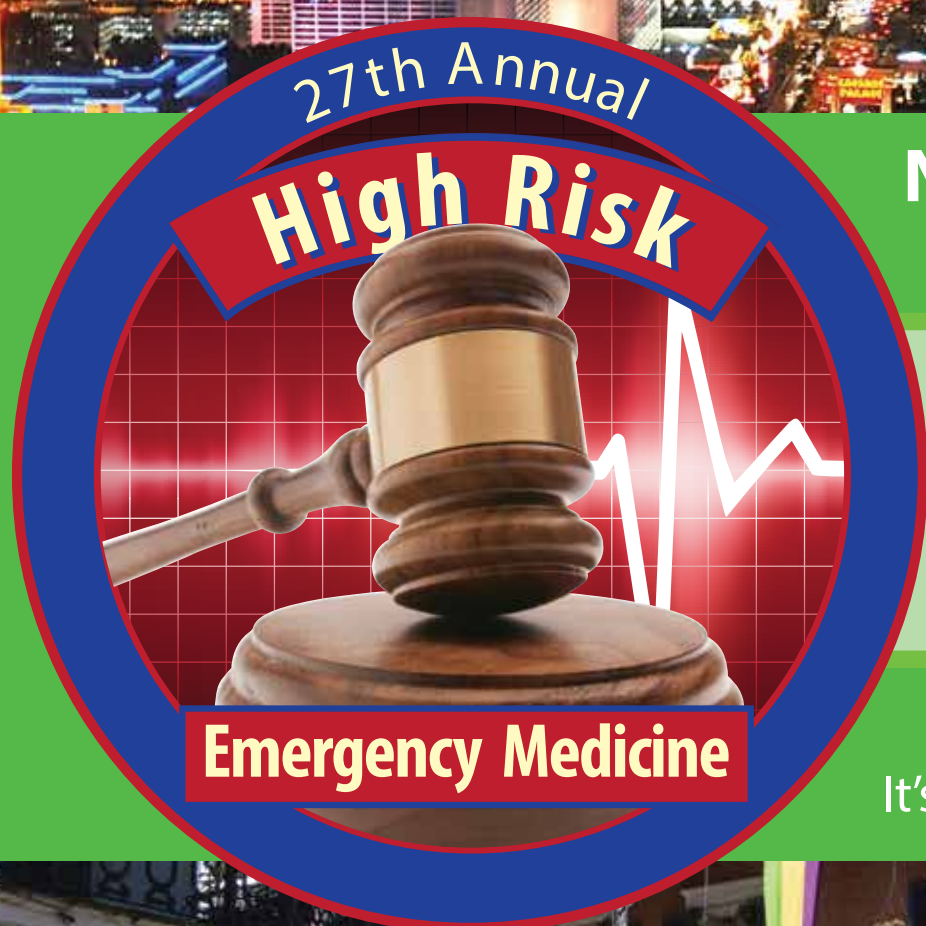
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