



Table of Contents

- 3 Forging a Path**
Follow in the footsteps of these inspirational leaders of EMS
By A.J. Heightman, MPA, EMT-P
- 4 Facilitating a Digital Dialogue**
Tom Bouthillet advocates for evidence-based cardiac care
- 6 Spreading Her Mission**
Stephanie Haley-Andrews raises awareness about pediatric care
- 8 Enhancing Motorcycle Rider Safety**
Rob Lawrence launches Rider Alert program
- 10 Gathering Empirical Evidence**
Mary Meyers tackles the statistics behind quality care
- 12 Building an Alliance**
Paul Paris addresses provider & patient safety
- 14 Dissecting In-Depth Training**
David Reinis invents unique hands-on approach to anatomy
- 16 Raise an Alert**
E. Reed Smith launches Active Shooter program
- 18 Groundbreaking Measures**
Pat Songer launches system redesign
- 20 Creating an EMS Safety Net**
Todd Stout builds intricate network via FirstWatch program
- 22 Blazing a Trail**
Wilderness EMS team creates EMS medical director course

Vice President/Publisher

Jeff Berend

Editor-in-Chief

A.J. Heightman

Supplement Author

Cynthia Kincaid

Supplement Editor

Allison Moen

Production Coordinator/Designer

Matt Leatherman

Advertising Director

Judi Leidiger

EMS 10: Innovators in EMS 2011 is a supplement sponsored by Physio-Control Inc. and published by Elsevier Public Safety, 525 B Street, Ste. 1800, San Diego, CA 92101-4495; 800/266-5367 (Fed ID # 13-1958712). **Copyright 2012 Elsevier Inc.** No material may be reproduced or uploaded on computer network services without the expressed permission of the publisher. Subscription information: To subscribe to an Elsevier publication, visit www.jems.com. **Advertising information:** Rates are available on request. Contact Elsevier Public Safety, Advertising Department, 525 B Street, Ste. 1800, San Diego, CA 92101-4495; 800/266-5367.

Cynthia Kincaid is an award-winning writer who has written numerous articles for medical and health-care publications and organizations. She was the recipient of a 2007 Excellence in Journalism award for the Society of Professional Journalists. Kincaid holds a bachelor's degree in journalism and a master's degree in public administration. Contact her via e-mail at cynthia@cynthiakincaid.com.



Forging a Path

Follow in the footsteps of these inspirational leaders of EMS

By A.J. Heightman, MPA, EMT-P

The mission of the EMS 10 Innovators in EMS program is simple but powerful: Find some of the best innovators in the EMS industry and alert the EMS community to their achievements of the previous year to help providers and patients in the future. The EMS 10 Innovators in EMS program, jointly sponsored by Physio-Control and *JEMS*, has gained in popularity of the five years since it was introduced to the EMS community. The reason is simple: EMS leaders want to hear about the programs that other EMS leaders and innovators have developed and implemented that are making a true difference in education, operation, prevention or clinical practice.

The selection committee chose this year's honorees after careful review of their hard work, dedication and selfless efforts in 2011. Most importantly, the candidates were all nominated by their peers and providers who recognized the true value of their work and contributions to EMS.

We profile each honoree in this special supplement to *JEMS* to not only inform and educate you on their innovative work in EMS, but also to encourage you to ride on the wave of their innovations, use them to better develop your EMS system and inspire you and your colleagues to think outside the box, take some calculated risks and innovate in an area of EMS that you feel could make a difference for patients, EMS systems or your prehospital colleagues.

A.J. Heightman, MPA, EMT-P, is editor-in-chief of JEMS. Contact him via e-mail at a.j.heightman@elsevier.com.



PHOTO GARY JACKSON

From left to right: Tom Bouthillet, Michael Millin, Seth Hawkins, Will Smith
(front row) Pat Songer, Rob Lawrence, Stephanie-Haley Andrews & David Reinis
(not pictured) Mary Meyers, Paul Paris, E. Reed Smith & Todd Stout

- Tom Bouthillet, EMT-P** ... Recognized for his efforts in promoting cardiac care via blog, podcasts and web mediums.
- Stephanie Haley-Andrews, RN, EMT-P** ... Recognized for her efforts in advocating for pediatric stroke and child abuse awareness in Colorado.
- Rob Lawrence, MCMI** ... Recognized for his efforts in creating an internationally recognized road safety initiative.
- Mary Meyers, MHA, EMT-P** ... Recognized for her efforts in conducting research on pain management, infection control, suicide prevention and quality assurance in Colorado.
- Paul Paris, MD, FACEP, LLD (Hon.)** ... Recognized for his efforts in partnering with the Jewish Healthcare Foundation in Pennsylvania.
- David Reinis, EMT-P** ... Recognized for his efforts in using pig hearts to teach myocardial infarction and 12-lead ECG patterns in Colorado.
- E. Reed Smith, MD, FACEP** ... Recognized for his efforts in formulating an Active Shooter program in Virginia.
- Pat Songer, NREMT-P, ASM** ... Recognized for his efforts in formulating a Community Paramedicine program in frontier Nevada.
- Todd Stout** ... Recognized for his efforts in tracking some 300 different agencies via real-time warning system.
- Wilderness EMS team** ... Recognized for their efforts in using Delphi Methodology to develop a unique wilderness training curriculum.

Facilitating a Digital Dialogue

Tom Bouthillet advocates for evidence-based cardiac care

In the beginning, there were MS-DOS, listservs, AOL, CompuServe and Netscape Navigator. Long ago, these and other “high-tech” inventions ushered in the digital age. My, how times have changed. Today we have Facebook, Twitter, Skype, blogs, podcasts, wikis, and a host of other online technologies that have literally transformed the way people communicate around the world.

And Tom Bouthillet, EMT-P, has been there from the beginning.

“Before the advent of Web 2.0, back in the days of Internet bulletin boards and listservs, I was already engaging my peers in online discussions,” says Bouthillet, a fire captain/paramedic with Hilton Head Island Fire & Rescue in South Carolina. “The EMS 2.0 movement was born out of social media, but for many of us it was a seamless transition.”

Tom Bouthillet



Embracing the Digital Age

Bouthillet has embraced the digital age with gusto. He is the editor-in-chief of the EMS 12-Lead blog and podcast, a Web columnist, creator of the 12-Lead ECG Challenge app and host of the Code STEMI Web Series at First Responders Network. He uses these platforms to advocate for the evidence-based care of acute ST-elevation myocardial infarction (STEMI) and sudden cardiac arrest patients.

“I had been teaching 12-lead ECGs and acute coronary syndromes in the

Critical Care Transport (CCEMT-P) program out of the University of Maryland Baltimore County for many years, and during that time, pre-hospital activation of the cardiac cath lab became a very hot topic,” he says. “Regional systems of care for acute STEMI were popping up around the country, and with that came increased expectations of paramedics’ ability to interpret a 12-lead ECG. I knew I had a lot of knowledge to share, and blogging seemed like the best way to reach as many people as possible in a relatively short period of time.”

Unlike many other blogs that quickly fizzle out, the EMS 12-Lead blog was an immediate success. “Most paramedics want to do a good job, but unfortunately, 12-lead ECG interpretation is often poorly taught, either because the instructors aren’t experts or because there are so many things that a paramedic is expected to be proficient in,” says Bouthillet. “The success of the EMS 12-Lead blog and podcasts clearly demonstrates that EMS professionals are eager to step up to the plate and do their part to streamline these systems of care and do the right thing for the patient.”

With cardiovascular disease being the number one killer in the indus-

trialized world, Bouthillet believes the topic is the issue of our time, and wants to be part of the discussion of how to better prevent cardiac events and more effectively treat cardiac patients.

STEMI Awareness

“The project I’m most excited about is the Code STEMI Web Series,” he says. “The executive producer is Ted Setla from Setla Films and First Responders Network. Most people know him from the Chronicles of EMS. He’s one of the most creative and visionary guys that I’ve ever worked with.”

The Code STEMI Web Series combines Bouthillet’s passion for emergency cardiovascular care with Setla’s unique storytelling abilities. The series showcases EMS professionals, nurses, physicians and policymakers and documents how they streamline the care of cardiac patients.

“The EMS community was appalled by NBC’s *Trauma* and with good reason,” says Bouthillet. “We don’t need to make up stories because our stories are incredible just the way they are. EMS professionals take to the streets every day all over the world and do their part to save lives. We wanted to get to know them in a personal way that was both entertaining and educational. We are very grateful to Physio-Control for helping to make this possible.”

Bouthillet also helps streamline care in his own community. “I’m very proud of Hilton Head Island Fire and Rescue. We’ve made huge strides to reduce the death and suffering associated with cardiovascular disease. We collect data through

the CARES registry; we activate the cardiac cath lab from the field for acute STEMI patients; we utilize a ‘pit crew’ concept for cardiac arrest patients, and we recently launched a

Recognized for his efforts in promoting cardiac care via blog, podcasts and web mediums.

‘Code ICE’ protocol where we initiate therapeutic hypothermia in the field.”

It seems to be working. “We’re saving more lives, and we can prove it now.”

One Step Ahead

Many of the best practices that have been implemented in Hilton Head Island were learned from other EMS systems around the country. “One of the most powerful things about EMS 2.0 is the ability to learn from your peers around the world. Many of the things that have been successful on Hilton Head Island were validated first in other areas like Seattle/King County, Raleigh/Wake County, Minnesota/Hennepin County and Austin/Travis County, Texas.”

In turn, Bouthillet shares those best practices with others in his blog and podcast. “You have to practice what you preach because that’s what makes you credible. On the other hand, there’s always something more to learn. I can honestly say that no one has learned more from the EMS 12-Lead blog and podcast than I have.”

He also attributes much of his success to his peers. “My associate editors David Baumrind and Christopher Watford are brilliant, and I’ve had some incredible mentors like David Hiltz from the American Heart Association and Stephen Smith from Dr. Smith’s ECG Blog.”

Bouthillet measures the success of his website—and the affect it has had on a worldwide audience—not in the number of Facebook friends he has (although he recently topped 11,000), or in the number of people joining his discussions or listening to his podcasts. No, he measures his success in the level of engagement and the degree of dialogue generated on his site and in the EMS community. “It’s not that people are just coming to my site,” he says. “More important to me is that they are engaging with what is there.”

It makes him happy to see spontaneous dialogue happening in the comments section of his blog, particularly when readers are wrestling with con-



Tom Bouthillet facilitates a podcast discussion about how to better prevent cardiac events and more effectively treat cardiac patients.

cepts and trying to find solutions to knotty problems. “I think it stimulates higher learning when they have to reason through a problem,” he says. “I don’t have to spoon-feed everything to them because they are engaging with one another. And that’s the power of the medium.”

For many bloggers and podcasters, the chance to disseminate their message to the masses springs from a desire to be famous or infamous—or perhaps to just needlessly stir the waters of controversy and debate, all toward a goal of creating little more than shock value. For Tom Bouthillet, the chance to disseminate his messages to the EMS world and beyond is born out of a desire to pay things forward, a hope that others will do the same, coupled with a yearning to help save as many lives as possible along the way.

“If I treat all of my patients like a member of my own family, then I hope that someone else will treat my mother and father the same way,” he says. “I look at a human life that is snatched away, all the possibility that was stolen, and I imagine what it would mean to bring that life back.”

“There are people who maybe had an arrhythmia while playing tennis. Maybe they were only 40 or 50 years old and had two kids. What’s that death going to do to that family?” Bouthillet hopes, in his own online way, to minimize that question for as many people as possible.

“I think by concentrating in this area of sudden cardiac arrest and STEMI, we can really start to make sure that our systems are optimized, so that when those precious chances come along, we really do give the patient the best possible chance of survival,” he says. “We owe it to the community, but we also owe it to ourselves.”

Log on to Tom Bouthillet’s site and join in on the conversation.

Spreading Her Mission

Stephanie Haley-Andrews raises awareness about pediatric care

After a successful 14-year career as a pediatric emergency department (ED) nurse, Stephanie Haley-Andrews, RN, EMT-P, began searching for a new calling. As she thought about it, she knew she would stay in emergency medicine. She knew she had a profound respect for the EMS colleagues she encountered every day. And she knew she cared deeply about children's medical and trauma care. The job she eventually fashioned for herself pulled all these elements together into something that has had a far-reaching effect on the state of Colorado and the neighboring region.

"I first had the opportunity to become the hospital's part-time EMS coordinator," says Haley-Andrews, founder and co-director of the EMS Outreach and Education program at Children's Hospital Colorado.

Stephanie Haley-Andrews



"We are the only regional Level I pediatric trauma center, and we are one of the top five children's hospitals in the nation. Kids come to us for specialty care from all over Colorado, and I had a vision for an EMS outreach and education program to better serve these children, and EMS. I created the mission and program in 2008 and haven't ever stopped."

That would be an understatement.

On a Mission

In addition to developing and implementing numerous groundbreaking

EMS initiatives in 2011, Haley-Andrews gave 62 classes or lectures at more than 32 EMS agencies and spoke at 14 conferences. She also visited nine of the state's 11 regional emergency medical and trauma advisory councils, which directly influence more than 800 EMS providers.

Why Is She So Driven?

Haley-Andrews is passionate about pediatric care, and in the state of Colorado, she has a lot of ground to cover and a lot of people to educate. Children's Hospital Colorado serves a huge region, much of which is rural, and many of the EMS and fire agencies are volunteer-based.

Haley-Andrews says national statistics show that pediatric patients make up only about 10% of any EMS agency's annual call volume, and only 2–3% of those are critical in nature. EMS providers simply don't have a lot of exposure to sick infants and children, which has been Haley-Andrews' driving force.

"If we want to best serve sick and injured kids, we must serve EMS," says Haley-Andrews. "I understood a long time ago if we can help EMS providers take better care of kids in the field, it improves patient outcomes and ultimately helps the community." Quality of care and evaluation of her education is an important focus of Haley-Andrews' program, which

was also recently recognized as a "best practice" hospital-based EMS program by Novia Strategies.

Relating to EMS

Knowing that EMS "is a far different animal" than emergency nursing, Haley-Andrews' first order of business was to get her EMT certification and then start making visits to EMS agencies to give them the information and education they needed to treat children. "Children's Hospital is not-for-profit, and a huge part of our mission is education," she says. "Knowing how many of our EMS agencies are rural and/or volunteer, with very limited training budgets, I knew I had to take our education to them. So I hit the road to live out my program's mission."

Haley-Andrews initially reached out to a few EMS agencies with a presentation about child abuse, aimed specifically at EMS providers. Some were wary of cost and then enthusiastically accepted her invitation to give the presentation when they found out it was free. She now lectures at state conferences and is booked through word-of-mouth and exposure on Colorado's EMS LISTSERV, which has thousands of subscribers.

"People often come up to me after I lecture and ask me to come to their agency," she says. "That's how it's taken off. I have never said 'no.' Not once. I just can't do that to them."

Recognized for her efforts in advocating for pediatric stroke and child abuse awareness in Colorado.

Child Abuse Awareness

Haley-Andrews' presentation on child abuse has been popular because she conveys the critical role EMS plays in spotting and stopping the abuse. "Everyone can see big signs of child abuse, but I go over very subtle signs with them," she says. "I talk to them

about how they richly serve this innocent, often voiceless victim of child abuse. EMS needs to know they have so much more power than they think they have, not only in terms of physical care of the patient, but also in the pursuit of justice.”

Children’s Hospital Colorado also is one of the top pediatric stroke centers in the country, and Haley-Andrews has been passionate about getting the message out about pediatric stroke. “When I started talking about pediatric stroke, people said, ‘Really? Kids have strokes?’ Yes, and we are finding out more about it every day,” she tells them.

Because the hospital is a specialty care center (e.g., cardiac and cancer), many families take up long-term residency in the Denver-Aurora area while their children undergo necessary treatment. She says research has shown 50% of pediatric stroke patients have an underlying condition that makes them susceptible to stroke. Haley-Andrews wonders if having an increased population of children with special healthcare needs in the metro area has attributed to higher stroke rates than published data. “We shall see,” she says. “The brilliant Dr. Timothy Bernard of our stroke program is watching the numbers.”

Sharing Her Message

Haley-Andrews and Bernard have partnered in getting the message to EMS about pediatric stroke, especially in light of an upcoming clinical trial involving clot busting agents in children. Children’s Hospital Colorado is one of only 15 hospitals in the world involved in this study. Because the overall incidence of pediatric stroke is relatively low, making sure pediatric stroke patients get to Children’s is paramount for the future of stroke care for children.

So Haley-Andrews developed and implemented quite possibly one of the nation’s first-ever EMS-activated pediatric stroke alert protocols that started with Aurora Fire Department.

“I went to Aurora Fire and asked if

they would be open to developing a pediatric stroke alert for their system. Ideally, we need these kids within five hours of symptom onset, so I asked if they would bypass other hospitals and get those kids to us as fast as possible,” she says. “Aurora Fire is very quality focused and agreed. Because of their implementation, we’ve been able to talk about the protocol with other agencies.”

One of Haley-Andrews’ proudest accomplishments is the grant she wrote and was awarded to teach pediatric advance life support (PALS) to 40 rural EMS providers around Colorado. “We don’t have a lot of rural providers out there that have a lot of experience with critical kids,” she says. “What if the very first pediatric patient they treat is the one that needs their life to be saved?” So Haley-Andrews wrote the grant and focused on the rural EMS agencies that would benefit the most from PALS education.

Haley-Andrews has also been instrumental in establishing the hospital’s Preferred EMS Provider program, in which EMS agencies must show a commitment to pediatric education by having paramedics PALS certified and agreeing to have specific equipment on hand, identified by the American College of Emergency Physicians. “They are the governing body in determining what should be on ambulances for pediatric patients,” says Haley-Andrews.

For this commitment, the agency becomes a preferred provider to the hospital, with the ability to call on medical directors and get advice on protocols, case reviews and all things pediatric. “This opens the doors between Children’s and EMS agencies,” says Haley-Andrews. “We are a resource for them. It’s not us telling them what to do. It’s a true partnership, and we learn a lot from them, also.”

In addition to being involved in all of these programs, Haley-Andrews sits on numerous advisory boards and teaches pediatric EMS content at two community colleges. “I’m so inspired by EMS and these amazing people that serve their communities,” she says. “I feel like I need to serve them, and part of that is being involved in certification education. The community colleges don’t have to pay me, and they’re getting expert education for their students.”

This workload would be daunting for most people, but Haley-Andrews finds her pediatric advocacy work rewarding and energizing. “Having worked in a pediatric ED my whole career, I have seen firsthand how EMS can save a child’s life,” she says. “EMS providers are the most down-to-earth, grounded, caring people, and I am so impressed by them that I will do anything to help them.”

Haley-Andrews stresses that a big part of the hospital’s role, and her role as well, is recognizing and acknowledging the remarkable contributions of EMS in saving lives, particularly children’s lives. “EMS is such an important part of helping kids and saving kids,” she says, “and I remind them of that.”

Ultimately, she says. “This is all about taking care of kids and taking care of EMS.”



Stephanie-Haley Andrews instructs EMS providers about various issues facing pediatric patients.

Enhancing Motorcycle Rider Safety

Rob Lawrence launches Rider Alert program

When Rob Lawrence, MCMI, initially started watching a motorcycle safety program develop and grow where he lived in the United Kingdom, he was intrigued. When he immigrated from the U.K. to Richmond, Va., in 2009, he brought his family, his worldly possessions, and this idea, which was started in Europe: that motorcycle riders and EMS could work together to help enhance motorcycle rider safety.

"I got in touch with a friend of mine who is the chairman of the United Kingdom Motorcycle Club and said, 'You've got a really good motorcycle safety program, could I borrow the concept?' From that point on we formed an international alliance supporting each other," says Lawrence, who is chief operating officer for the Richmond Ambulance Authority (RAA).

Birth of an Idea

It all started from that conversation, and now the Rider Alert program is growing into one of the most innovative and popular motorcycle safety alert programs in the country. In essence, motorcycle riders are issued a free card and decal. They fill out the card, listing their next of kin and any

medical conditions. The cards are then placed inside their helmets. A free decal is also issued that alerts medical personnel or accident bystanders about the card inside the helmet and also states, "Do Not Remove Helmet." The decal is aimed to guide passersby or laypeople, who might try to force the helmet off while trying to help the rider in the event of an accident.

"It's a simple waterproof card that goes inside the helmet and contains key information about the rider," says Lawrence. "The decal alerts the medic that

there is something in the helmet and warns a bystander not to meddle in helmet removal. That's how simple the concept is."

That simple concept has now swept six states and is spreading internationally. In the 11 months since its inception, Rider Alert has issued 125,000 free cards to motorcycle riders within Virginia, Maryland, West Virginia, North Carolina, New York and Arizona. It's also working with motorcycle clubs in Sweden and Australia to get the cards and decals approved in those countries. "The speed with which this has taken off has been phenomenal and life altering," says Lawrence.

When the program launched this past April, the chairman of the U.K. Motorcycle Club came to Virginia to help get the program off the ground. Because of the friendship between the European and Virginia motorcycle clubs, and because the program has been so unique and effective, Rider Alert was awarded the 2012 Prince Michael International Road Safety Award. "We've had international recognition, and we are very pleased with that," says Lawrence.

Why the popularity? Lawrence suggests a number of reasons. "It's free to the rider, there is no requirement to register your decal, and there is no data held on you," he says. "The card is there for when we need it to

help the rider when they need us. The principles of that have been very well received."

The program is operated through what is now a Who's Who of corporate sponsors, including Bon Secours Richmond Health System, the American Automobile Association, GEICO, PHI Inc., and the public safety agencies of the Shenandoah Valley.

Going Viral

"We started off with Motorcycle Virginia, a not-for-profit organization, and then Bon Secours Virginia came on board and embraced the idea," says Lawrence. The hospital developed a website (www.rideralert.org), and issued a press release on the program. "We had almost overnight brand recognition," Lawrence says. "We started off with their sponsorship, and by day two, the program had gone viral on the Internet. The concept flew around the motorcycle community. The Virginia State Police and Virginia EMS are all supporters and distributors, as well as the motorcycle dealers in all the places we are operating."

Rider Alert also is using EMS to broadcast the details of the program internally, and periodically, e-mails are sent out to remind EMS personnel about the program.

"Now that we have brand recognition, we are going around to volunteer rescue squads," says Lawrence. "Not only will we give you a presentation on the card and how it works, but we will also give you a refresher in helmet removal." Rider Alert is trying to secure continuing education credits for these presentations.

"We want to continue to perpetuate the knowledge and understanding of getting the card out and removing the helmet effectively," Lawrence says. "Some volunteer rescue squads may not do this for months or years, so we want to increase the level of education

Rob Lawrence



that goes with it.”

Lawrence hopes these volunteer rescue squads will not only be distributors of the cards and decals, but they will also use the presentations as a chance to go into communities to speak about rider safety while drawing attention to their own organizations. “That will help them raise their own awareness, as well,” says Lawrence.

Costs for the program are low. Bon Secours picks up the marketing and website tabs, and the people running the organization give freely of their time. The sponsors pay for the cards and decals. “We are not making a profit,” Lawrence says. “We are not trying to sell anything. We’re just trying to promote motorcycle safety.”

Increased Survival

Shortly after the program started in Virginia, a rider was thrown from her bike and knocked unconscious. Fortunately, she had a Rider Alert card in her helmet, which led to the saving of her life. In another case, a paramedic who arrived at the scene of a motorcycle accident might have begun treating the rider’s trauma had they not seen the decal and retrieved the card instead. “The card identified that the rider had a medical condition, and the medic realized that the medical condition had caused the accident,” says Lawrence. The paramedic treated both the trauma and the medical condition, and the rider lived.

Rider Alert prefers that riders receive their cards and decals personally, as opposed to receiving them through friends or the mail. “We like people to individually hand the card out to the rider, and the reason for that is because it gives the rider a moment to think about their mortality,” Lawrence says.

“In that moment, they realize that the card is not a Kevlar-coated cloak of protection, but a piece of paper that may help them in an accident. It makes them think about their safety,



Rob Lawrence modeled his Rider Alert program after a similar motorcycle safety program in the United Kingdom.

the safety of their bike, their driving style, and the equipment they’re wearing. It’s an opportunity to talk about personal safety.”

Feedback from the EMS community has been enthusiastic, to say the least. “We haven’t had a bad word from the EMS or public safety community. We’ve had more positive feedback than I could have ever hoped for,” says Lawrence. “The riders love it too because they realize it’s something that will help us help them.” In fact, the way Lawrence looks at it, the real owner of the card is EMS. And one day, if they need to, EMS will get the card back from the rider.

You’d think someone this passionate about motorcycle safety would be an avid motorcycle enthusiast and rider himself. But Lawrence is not. “I am not a motorcyclist; I’ve never ridden a motorbike,” he says. “I lost a brother to a motorcycle accident decades ago, and the shock has never left the family.”

The news of his brother’s death arrived via a police knock on the family’s door. “What I wouldn’t want to wish on anyone is that knock on the door, and if I can reduce just one extra knock on the door, then it’s all worth doing,” he says.

Recognized for his efforts in creating an internationally recognized road safety initiative.

Sometimes, Lawrence is asked why a program like this hasn’t been developed before now. His answer is straightforward: “It’s probably because it’s such a simple concept, and that makes it so popular,” he says. “It’s something

everybody gets and everybody wants, so it makes our job a lot easier.”

Lawrence is passionate about this program, although he worries about distracted drivers who don’t pay attention around motorcycle riders. He worries about more and more drivers talking on cell phones, texting while driving and being less attentive overall. If this program can help those motorcycle riders stay safe, then he believes the program is doing its job.

“I have seen the carnage caused by motorcycle accidents, and doing something is better than doing nothing,” he says. “This program has helped us to help many people. In 11 months, we have already seen that.”

If Lawrence has his way, every motorcyclist in the world will carry a safety card inside their helmet, have a decal firmly affixed outside the helmet, and travel with his blessing for a safe journey.

Gathering Empirical Evidence

Mary Meyers tackles the statistics behind quality care

As a former street paramedic, Mary Meyers, MHA, EMT-P, understands the difficulties that EMS providers face each day, particularly working in an unpredictable environment.

That's why she turned to mathematics—statistics to be specific.

The self-confessed “math phobe” is currently a research specialist with Centura Health and a member of the newly formed Denver, Colo., hospital-based Center for EMS Quality, Integration and Research. Her statistical analyses and research are providing the kinds of evidence-based, empirical knowledge needed to make real strides around pain management, infection control, suicide prevention and quality assurance.

Her journey from being a paramedic to getting a doctorate in health services research is unusual to be sure, but it's a path that's having a tremendous effect on the EMS community. Her influence could have far-reaching implications and meaningful improvement for patient and prehospital care of the future.

Mary Meyers



EMS & Hospital Care

“I think EMS care definitely affects hospital care, which is the main thrust of my research,” she says. “So many people like to think that EMS doesn't really do any patient care that affects anything. Just get the patient to the hospital, and we'll take care of them. But I don't see things that way. I see the prehospital

provider making a big impact on patient care in the long run, and I think that's going to become more apparent in the years ahead.”

Her areas of research center squarely on the premise that EMS care not only affects patient outcomes, but also hospital processes and procedures. Take pain management, for instance. Right now, hospitals are being held to standards they've never been held to before, and as a result, their reimbursements are based more and more on patient satisfaction scores, she says.

“If a patient arrives at the ED and hasn't had good care in the prehospital arena, like receiving pain medication, then what [state of mind] is that patient going to be in at the ED?” she asks. “What kind of scores are they more likely to give the hospital? To the patient we are one big system, and if one part fails them, this will affect their perception of the entire system.”

The importance of this, she stresses, is not just in giving proper patient care, but also in thinking about the reimbursement and penalty ramifications for hospitals. And EMS may have a direct role in that.

A Different Approach

Meyers and her team also have taken a somewhat different approach to researching and analyzing infection control issues, specifically by scrutinizing how well EMS providers clean their stretchers and equipment after they drop off a patient. “The reason we are doing that research is because equipment that is not disinfected can make prehospital providers sick, and it can make their patients sick,” she says.

And because hospitals don't get reimbursed for patients who get hospital-acquired infections, eliminating cross contamination from unclean equipment is paramount. “Our patients could become very ill, and hospitals will have to eat all those costs of care, so they are extremely expensive infections,” she says.

Hospital-acquired infections are becoming a center of real debate, given the money—and reputational risk—that is at stake. Meyers believes hospitals are going to be casting a critical eye in the search for the origin of those infections. “Hospitals are going to be wondering if a patient acquired an infection from prehospital care and then saying it's not fair that they have to take the complete hit for the cost of that infection,” she says. “So they may try to roll that back out into the field and force the EMS provider to pay for part of the costs. Or, the EMS provider could be penalized for causing such an infection. That easily could happen because these infections cost billions of dollars, and they are hitting hospitals pretty hard.”

Tracking ED Times

Another area that Meyers sees as having great impact on EMS is in the tracking of median emergency department times. The longer a patient stays in the ED after arrival, the more at risk a hospital will be for not receiving full reimbursement. “Paramedics can easily influence and cut down on those times with prehospital care, labs, blood draws, screenings and interventions,” she says.

Several years ago, Meyers became curious about whether pre-notification times that paramedics provided to EDs actually cut down on door-to-balloon times. Such is the life of an inquisitive researcher. She found out that it did. She also found the same thing was true of people having strokes.

“When EDs receive advanced notification, on say STEMIs for example, then that cuts off a whole lot of time, because the ED can mobilize the cath lab, can get the cardiologist in the ED sooner, and prepare the ED quicker,” Meyers says. “This automatically cuts down on door-to-balloon times. And now there are studies out that confirm early notification by EMS decreases door-to-CT times for stroke patients.”

Meyers has devoted the second half of her career to these important, in some cases groundbreaking, research studies. So it’s an ironic twist that some of her most impactful and potentially life-changing research is rarely published, for a variety of reasons. Perhaps it’s the nebulous nature of the subject matter. Perhaps it’s because concrete conclusions are difficult to determine. Whatever the case may be, Meyers continues to work with the subject matter in an attempt to find answers that will help save many lives.

“Colorado has one of the highest suicide rates in the country, and no one has been able to come up with a plan to stop it,” she says. “There are no effective national suicide prevention strategies or tactics that work. We do a lot of peripheral research around suicide, and what we’ve learned is that it’s extremely complicated and difficult to predict. That’s why no one’s been able to stop the suicide rate.”

Suicide Research

But Meyers is determined, through research and data mining, to try to root out some of the factors that may play a key role in why people commit suicide, so that effective strategies can be developed to address this growing problem.

To begin, she started to think about public health agencies and how they track death statistics (because death certificates are issued by counties). Then she talked to some paramedics in a particular fire station in her area and they mentioned they had a

high rate of suicide calls. She checked into it and found that to be true.

“I talked to another big fire department, which is adjacent to this other one, and they also have a high rate of suicides and suicide attempts,” she says. “Then I started looking at the other areas around them and they had hardly any.”

Puzzled, she realized that analyzing suicide rates by county skewed the numbers. “Why can’t we drill down these suicide hotspots into fire districts and even fire stations?” she asks.

She hasn’t had time to delve into this research quite yet, but it’s on her list. She hopes by breaking down the geography of suicide calls into something manageable, trends will emerge. Narrowing down a suicide hot spot could reveal useful information about the age groups, schools, incomes or other important demographics that could lead public health investigators to question the underlying patterns that contribute to these suicide rates.

Why is this so important to Meyers? Because she believes emphatically that paramedics are some of the best people in healthcare in identifying suicidal patients. And she has the research to prove it. “They see that patient in their own environment, and they can see what’s going on before that patient has a chance to mask anything in the emergency department,” she says. “Paramedics are extremely perceptive, and they always advocate for the patient. People have a very favorable view of paramedics and are not intimidated by them, so they tend to open up a lot more with paramedics, and that’s why they’re so good at picking up on suicide ideation. I think it’s an untapped resource in a lot of ways.”

If you haven’t guessed by now, the core of Meyers work centers on her love of EMS and her desire to make the job and lives of paramedics

and EMTs more rewarding and easier, all while still casting a light on the critical role they play in healthcare.

“I think EMS is a discipline that’s in its infancy with its importance to the medical community and patient care,” she says. “EMS is now at the dawn of recognition of how important it is, and its importance is going to be increasingly recognized; and I want to be at the forefront of that recognition.”



Mary Meyers aims to spread the word about the many challenges EMS providers face and find ways to improve.

Recognized for her efforts in conducting research on pain management, infection control, suicide prevention and quality assurance in Colorado.

Building an Alliance

Paul Paris addresses provider & patient safety

Let's be clear about the focus that Paul Paris, MD, FACEP, LLD (Hon.) has on EMS. Paris, professor of emergency medicine at the University of Pittsburgh School of Medicine and medical director for the Center for Emergency for Western Pennsylvania, is all about the health and safety of EMS providers. To prove it, he has spent much of his professional life advocating for the kinds of research that will make their lives safer and easier.

"EMS providers are neglected heroes," he says. "They are underappreciated, overworked, underpaid, and their safety and wellbeing isn't well cared for," he says. Not to mention the potential injuries to backs, shoulders, knees, the stress and the toll on emotions. "We expect so much from folks that we don't really compensate materially or emotionally," he says. "It's a major dilemma that most Americans don't have a clue about."

Paul Paris



A New Alliance

So when Paris got an opportunity in 2011 to partner with the nationally recognized Jewish Healthcare Foundation (JHF) to address the issues of patient and provider safety in prehospital care, he jumped at the chance. "JHF is a foundation whose mission is largely to improve quality and safety in healthcare," says Paris.

Under his leadership, JHF funded an EMS safety fellowship/quality champions program to help translate the

quality improvement and patient safety work they pioneered in the hospital setting to EMS services throughout Western Pennsylvania. JHF has funded similar programs with physicians, pharmacists and nurses.

This past year, the champions program chose 20 EMS fellows to participate in cutting-edge quality improvement and safety training exercises. Many of the participants brought their own ideas for projects and initiatives to work on during the yearlong program. The goal of the program is that the fellows will take both the tools and the insight they have garnered during the program back to their own EMS agencies once their fellowship is complete.

Some of the projects are simple, yet effective. Take, for instance, the flight medic who noticed that, because of logistics, the pre-shift check of the helicopter was only getting completed about 70% of the time.

"What she did was go through and analyze the process, how does it get done, and what leads to it not getting done," Paris says. "She changed some very simple things, like where the checklist is located, and putting extra copies in different locations, and now the pre-shift check is completed 95% of the time."

This kind of logistical need for pre-checks is common, according to Paris. "In our region, for example, when we've done unannounced inspections of ambulance, we tend to find things like suction units that don't work, or vital drugs that are outdated, or equipment that's just not on the truck," he says. "We need to pay more attention to the most basic details of a culture of safety."

Educational Advances

In addition to project work, the 20 fellows go through an online educational component, called perfecting patient care, which teaches Lean-based methodology. They also become members of a community of professionals interested in safety through a companion online portal called Tomorrow's Healthcare (<https://tomorrowshealthcare.org>). They also do some classroom work, attend a series of quarterly lectures and undergo periodic analysis of their respective projects.

Another student's project revolves around the question of why patients in extreme pain, say, from an acute fracture, aren't given adequate analgesia. Paris cites a study where paramedics had standing orders that allowed for the dispensing of morphine or a mixture of oxygen and nitrous oxide without having to call a doctor. If they thought the patient was in pain, they could go ahead and dispense the analgesia.

"So they looked retrospectively at a thousand patients, with suspected extremity fractures, and only 18 out of 1,000—1.8%—got pain medication," says Paris. "We don't know why there is this incredible reluctance on the part of paramedics to treat patients who are in obvious pain. So this student has designed a questionnaire that we are sending out anonymously to try to find out the most common factors that paramedics give for not being more proactive, or even reactive, when it comes to treating a patient in pain."

Another student's project revolves around the issue of EMS provider health, specifically, in the areas of diet and exercise. "Because of their work schedules, many paramedics and EMTs don't practice the healthiest patterns," says Paris. "[The student] analyzed ways that, during their shift, they could routinely stretch, or go on a walk by mapping a customized walk-

ing trail around every EMS station or helipad, with distances measured.”

Dozens of EMS personnel applied for the few select spots, so just how were the winning applicants chosen? Paris says they looked for people who might be EMS champions, leaders or future leaders, who either by their position or intense enthusiasm would, after the course, teach the principles they learned to others, and “start to move the tipping point where safety is a consideration.”

“A couple of years ago, if you would have said to 1,000 EMS providers, please describe your understanding of a safety culture, I would say 95% would have been totally clueless,” says Paris. “A safety culture is part of everything you do and plan; it’s always a consideration. This is not only about patient’s safety, but also about provider safety, where we don’t allow our providers to be put in situations where their health and wellbeing is jeopardized or that of their patients.”

Unique Challenges

Paris is quick to admit that improving the lives of patients and first responders, while much needed and gratifying, also comes with its own dilemma. “We can get national attention to the fact that ambulances and patient care are much less safe than they should be, but I just told you that paramedics are heroes and no one is appreciating them,” Paris says. “The last thing they need is for the public to think it’s unsafe when they call an ambulance, or that these people are not delivering great care.”

He adds, “In EMS, there is a lack of uniformity—different partners, a lack of communications between partners in the hierarchy of authority. Every aspect that could threaten patient safety occurs, but we don’t want the public to start feeling bad about paramedics because they’re already beat upon. I love paramedics. So how do we fix it without embarrassing anyone?”

The answer may lie, in part, in med-

ical error and prevention reporting systems, which encourage anonymous reporting of medical errors for the sole purpose of addressing, and correcting, faulty systems, rather than punishing the offender.

“So, instead of having an environment of blame, which is what we have now[is], let’s have an environment of openness and anonymous reporting, in which we try to figure out where the system’s flaws are, and how we can try to help protect people from making mistakes by designing a safer system,” Paris says.

Paris is hopeful that the projects completed under the JHF partnership will have broad and far-reaching impact. Now that the yearly champions program is coming to a close, he has his sights set on a new initiative, one that again partners with JHF. And with our growing digital age, the program should be popular. Paris envisions an online education program that will be very EMS specific. “We hope to do this next year,” he says. “The content will be interesting, with real-life situations, not talking heads, that will point out the issues and what will be necessary to address those issues to create a culture of safety.”

Some would consider Paris a champion of EMS, but he brushes the compliments aside, preferring to cast the spotlight on the EMS provid-

ers who are on the frontline every day caring for patients and saving lives. “I’ve always identified with underdogs, the underappreciated and

unrecognized,” he says. “And there is no one in this society more underappreciated than EMS providers. The job is stressful, challenging, and yet they are the ones that sometimes determine whether our loved ones are going to live or die.”

Sharing Knowledge

As for the just-completed JHF champions program, Paris hopes some of the findings that come out of the student’s projects will be published, talked about, and, eventually, have a positive effect, although he acknowledges that is sometimes a slow process. Still, he’s hopeful.

“The whole program is going to be described in great detail by one of the students, Daniel Patterson, who is co-editor of this past issue of *Prehospital & Disaster Medicine*,” he says. “Almost the whole issue is devoted to patient safety. We expect impact that will be a pebble in a pond, slowly emanating waves.” Patterson was named as one of 2010’s EMS 10 innovators.

Paris concludes, “One of the biggest steps that can occur would be for society to begin to recognize the value of EMS providers and ensure that they are treated with the same respect and rewards of other members of the healthcare team.”



Paul Paris’ program funded an EMS safety fellowship/quality champion program to help translate the JHF’s quality improvement and patient safety work.

Recognized for his efforts in partnering with the Jewish Healthcare Foundation in Pennsylvania.

Dissecting In-Depth Training

David Reinis invents unique hands-on approach to anatomy

David Reinis, EMT-P, has been a paramedic for more than 30 years, an EMS educator for four and a creative, out-of-the-box thinker all his life. His unique way of looking at the world, combined with his educational talent, has taken dissection to a new level and given EMS providers a chance to elevate their hands-on skills in a most unique and proactive way.

Different Type of Lab

“Nursing and pre-med students and physicians all get cadaver labs, and they all get to take a look at the body’s anatomy at some point in their training,” says Reinis, who is an EMS educator with Centura South Denver EMS in Denver.

“In EMS, our training usually isn’t that in depth. We are taught anatomy and physiology, but when it comes down to how anatomy functions, and seeing and feeling that in a meaningful way, it’s just not done,” he says.

Reinis set out to change that—with the help of some pigs.

Reinis found out about a pig dissection class being offered by St. Jude Medical Center and Parker, Porter, Littleton Adventist hospitals to a group of metro-Denver hospital employees. The idea intrigued him so much that

he began investigating the possibility of modifying the dissection class to teach anatomy to prehospital providers as it related to myocardial infarction (MI) and 12-lead ECG patterns. Reinis figured that if it were modified properly, it would give providers a hands-on approach to heart anatomy and bring realism to cardiac care and treatment.

“This new program is training paramedics to actually visualize and dissect the internal structures of the heart, allowing them to feel the vessels that feed the different parts of the heart and

how they correspond to ST-elevation and depression levels,” he says. “This ‘real world’ approach has given EMS personnel the opportunity to work directly on the heart and fully understand their own role in treating those with cardiac issues.”

Up Close & Personal

Like many of us, Reinis has sat in numerous presentations being “Power-Pointed to death.” Reinis says he knows that while those static presentations can be valuable, actually holding a heart, seeing the anatomy up close and feeling the texture would bring reality to the bullet points on a slide.

“Most paramedics have not seen the leaflet of a heart valve; most don’t realize the leaflets are transparent,” he says. “The structure of a heart is nothing like we picture. I wanted to take the actual physiology, put it in their hands, and let them realize and connect that to what we are teaching, which is cardiac alert.”

Reinis was convinced that if paramedics could feel the right side of the heart and realize it’s half the thickness of the left side of the heart, and then observe the heart valves up close, they could understand on a visceral level

why people with hypertension or other heart ailments could have their heart fail so quickly.

“We are always doing simulations with prehospital providers because that’s the best way we have to put them in a situation that they may come across one day,” he says. “Why not take that one step further and give them anatomy that is comparative to human anatomy? They can take a look at the different heart structures, so they have a meaningful understanding of what they are dealing with.”

The class goes as far as letting the prehospital students perform hands-on cardiac catheterization on their pig hearts. “They got to see the coronary arteries and what it’s like to try to catheter a coronary artery,” says Reinis. “This helped them understand what they need to do to prevent a myocardial infarction.”

Devoted to an Idea

Naturally, when he approached various people with his new and innovative idea of using pig dissection to train paramedics, he thought there would be wholehearted acceptance. Well, not quite. “It took a little bit of selling because the idea didn’t strike a lot of people initially,” he says. But Reinis persisted. He knew his idea was a good one that would save lives.

He prevailed. In cooperation with the hospitals and under the guidance of team physician and advisor, Eugene Eby, MD, FACEP, the first class was launched. The first time paramedics held a pig heart in their hands, they loved it. To date, more than 400 paramedics have been trained in Reinis’ program, and another 200 are scheduled to take the training.

You might think that the class is a success and Reinis would be satisfied. But you’d be wrong. Remember that part about him being a lifelong creative thinker? Well, Reinis is now tak-

David Reinis



ing his pig dissection idea and moving the concept into brain dissection—with the help of some sheep.

“I’m having a neurosurgeon come in and assist me with that,” he says. “Anatomically, sheep brains are the same as pig hearts, except for size, so I’m going to do a lab with those.”

Why the brain?

“What I’m trying to tie in with the brain is not only the structure and stroke-like criteria, but to relate it to trauma,” he says. His goal is to have the neurosurgeon teach class participants brain structures and anatomy, along with the presentations of various brain damage. “What we are going to do is show brain anatomy, and then trace that to the signs and symptoms when presented with that portion of the brain.”

In other words, if someone has a stroke, or is suffering from multiple sclerosis, they may have plaque that has built up in a particular region of the brain. The neurologist will visually point out what the presentation in that part of the brain might look like in those situations.

As if all this weren’t enough, Reinis also reviews and explains STEMI mimics from this anatomical perspective, instead of expecting paramedics to memorize ECG patterns. He wants paramedics to be able to make sound judgments and educated calls from the field, especially when having to call in-hospital personnel for stroke or cardiac alert situations.

The same people aren’t always working in the hospital at the same time. This means that, when you have an alert situation, sometimes key personnel have to be called in.

And sometimes heart signs mimic one thing when the patient is actually suffering from another condition. “We want to make sure people are being called appropriately. Or if a patient presents with myocardial infarction that isn’t, we want to narrow that down so when medics make the call, they are making the right call on the



David Reinis’ educational program takes ‘hands on’ to a whole new level for students.

patient,” Reinis says. “You can have patients present with a MI on an ECG for numerous reasons: Pericarditis, hypothermia, or Osborn Waves that look similar to ST changes.”

One of the best examples of a mimic is a patient presenting with Takotsubo cardiomyopathy, also known as broken heart syndrome. “It’s usually brought on by huge stress in a patient’s life, and they will have specific ECG changes that look exactly like MI,” Reinis says. “But when we catheterize them, there is no obstruction in the coronary arteries.”

If paramedics working in the field have knowledge of these mimics and how they work, and if they come across a case that they have high suspicion might be a mimic, then they can better relate that to the hospital during their call and let them make the decision on what to do.

Although Reinis conducts these classes mainly in the Denver metro area, he would like to see his pig-heart and sheep-brain dissection courses go national, providing all paramedics with the opportunity the chance to work on the anatomy in a realistic setting.

“Most of us are very hands-on, and if we can look at the anatomy, that’s the way we learn best,” Reinis says. “Why are we doing scenarios and simulations when we can actually put an organ in their hands? A scenario is

a make-believe situation. Instead of make believe, I give them realism to hold in their hands that draws a connection in their mind.”

In the end, Reinis

wants all of this hands-on training to not only help paramedics in delivering more accurate and useful life-saving procedures, but also to help, perhaps, reignite their passion for medicine and the EMS profession.

“Because we are not physicians or nurses, I think paramedics can feel a little neglected,” he says. “We feel a little on the outside. All these paramedics are bright eyed in these classes because they are truly excited to have the opportunity to utilize tissue that has a relationship to their practice.”

Recognized for his efforts in using pig hearts to teach myocardial infarction and 12-lead ECG patterns in Colorado.

Raise an Alert

E. Reed Smith launches Active Shooter program

No one in the nation will ever forget April 20, 1999, as the day that two students from Columbine (Colo.) High School opened fire and killed 12 fellow students and one teacher and injured more than two dozen others.

More than 10 years later, it's still a day that sticks in the mind of E. Reed Smith, MD, FACEP, the operational medical director for the Arlington County (Va.) Fire Department and an assistant professor of emergency medicine for George Washington University. Unfortunately, there have been many days, like Columbine, where active shooters position themselves on campuses or office buildings, with too many lives lost. Despite quick response by law enforcement and EMS in some of these situations, Smith thinks the response could be quicker and more effective.

E. Reed Smith



"We did an active shooter's drill here in Arlington County, with 20 or 30 students acting as victims," he says. "We staged, and two or three hours later, we were still staged and waiting. They had the shooters sequestered in the library, and the SWAT team was in negotiations, and we are still not in the building."

Smith knew something had to change.

A Call for Change

Smith sat down with the Arlington County Fire Department Special Operations Battalion Chief Carl Lindgren, and

they discussed developing better ways for EMS to respond more effectively in active shooter situations, while still protecting first responders.

What they ultimately developed was the Rescue Task Force, one of the first active shooter response programs in the nation. The Task Force was based on the military's tactical combat casualty care (TCCC) guidelines and the military doctrine of combat medicine. The Rescue Task Force is so named to comply with National Incident Management System guidelines. "We are putting police and fire, which are two different entities with different resources, together toward a common goal of saving lives," says Smith. "That's where the name comes from."

Initially, basing the program on TCCC seemed to Smith to be the way to go. "TCCC is a phenomenal doctrine that has saved so many lives," he says. But then, he began to realize that the military basis of the doctrine didn't quite match up with the civilian situations that fire and rescue departments were encountering. "It's written for a military environment, with military participants, equipment and resources," he says. "It's not written for civilians, and it doesn't take into account the nuances of the civilian environment. I needed something written for the civilian environment, with civilian equipment and resources."

Translating the Doctrine

Although TCCC is based on solid battlefield medical procedures, it doesn't take into account the different scopes of practice between agencies, whether down the block or across the nation. It doesn't take into account the differing kinds of equipment EMS agencies may deploy. "And it doesn't

take into account that I may be treating 5-year-olds and 65-year-olds," Smith says. "The bullets are the same; the weapons, the explosives, and a lot of the tactics are the same. But there are significant differences."

So he and Geoff Shapiro, a colleague at George Washington University, sat down to begin the process of translating and redrafting TCCC into a civilian format that EMS, fire and law enforcement agencies around the nation could use in all high-risk medical scenarios. They coined the term tactical emergency casualty care (TECC) and established a not-for-profit committee of nationwide experts to develop the civilian guidelines.

The goal of Rescue Task Force is aggressive forward deployment of medical assets into a non-secure scene. If someone is standing in a hallway shooting at people, EMS will not be deployed. But, after the police complete a primary sweep, when there is decreased risk with the scene not completely secure, the Rescue Task Force will be deployed.

"It takes four hours to secure an area, and we're not going to wait that long," says Smith. "It takes 10 minutes to do a primary sweep to make it safe, but not secure, and then we're going to go to work. We use tactics and equipment to mitigate the threat."

Creating a Plan

The first two arriving Arlington Fire paramedics now team up with two police officers. Once the initial police contact teams complete their sweep, the paramedics proceed. Wearing ballistic gear and carrying simple medical supplies, the Rescue Task Force group works rapidly in this "warm zone" to stabilize the wounded and evacuate to care.

"Before Columbine, police officers would show up to the scene of the shooting, surround the building, and

secure the perimeter, so the bad guy couldn't get out. Then they would wait for SWAT to show up. That was the old paradigm," says Smith. "Now, across the country almost every patrol officer is trained that if there is an active shooter, the first three or four officers that show up immediately go after the bad guy. We wanted to deploy a similar paradigm for fire/EMS. The first few arriving EMS units can team up with police and move into the building to start rendering care without delay."

Smith admits the selling of the idea initially encountered some pushback. But he was able to convince others that the idea was sound because the Task Force combination of police and fire working behind the initial contact teams allowed for the mitigation of risk, while saving lives. "You mitigate risk with tactics, good training, and good command," he says. "It's training, tactics, and equipment."

Being on the Rescue Task Force also requires a different mindset.

In a high-risk environment, first responders need to do things that are absolutely medically necessary, not things that are nice to do, says Smith. "In standard EMS, we do the things that need to be done, but we also do a lot of things that are nice to do. What we had to do in that high-risk situation in that hallway in a high school was define, 'What needs to be done?' Because every second you stay there you're at risk. We based those medical recommendations on the tactical emergency casualty care guidelines."

Going International

Smith's idea has been spreading. In this past year, the program has pushed into the regional level, with several agencies in the national capital region adopting the concept. The idea has gone international, as well. The London Fire Brigade met with Smith this past year.

They have taken some of the con-

cepts and guidelines back with them and are now using them to form their own active shooter medical care and evacuation procedures.

Which leads to a point that Smith wants to emphasize: Rescue Task Force is about concepts and guidelines that are flexible and adaptable to different agency and jurisdiction needs. "You can do this," he says. "You just don't have to do it the way I'm doing it. This works for my county. Bigger counties and bigger agencies need to figure it out."

The City of Fairfax Fire Department did just that. "They took the Rescue Task Force idea and made it appropriate for their system," Smith says. "The point is, the Rescue Task Force doesn't have to look in my agency the way it looks in your agency, as long as the goals are the same, which is to quickly get medicine at the point of wounding. If you want to send in 20 police officers with one medic, I'm fine with that, as long as we're getting medicine into that warm zone, which is key."

Recognized for his efforts in formulating an Active Shooter program in Virginia.



E. Reed Smith's Rescue Task Force was based on the Tactical Combat Casualty Care (TCCC) guidelines and the military doctrine of combat medicine.

Smith says the idea of Rescue Task Force has been well accepted, although he admits getting the idea across has been a challenge at times. He doesn't seem to mind breaking down the "we've always done it this way" mindset, however, equating the

process to how people used to think the Earth was flat.

"For a long time, we thought the world was flat," he says. "When we were presented with evidence that it was otherwise, it took time for people to change their view. Now, everyone knows the world is round. Just because we've always been doing something one way doesn't mean it's right."

Taking Risks

Smith feels the rescue paradigm in fire and EMS needs to change. He agrees that first responders need to be kept safe, but he also believes the job requires acceptance of risk. "We have to accept risk, but it has to be mitigated risk. It comes down to understanding risk and how you mitigate that risk, not being afraid to change the paradigm."

Smith is passionate about Rescue Task Force because he has children of his own and because he thinks it's a simple idea with huge ramifications. "I think this is a way we can make the world better," he says. "If we train thousands of hours and save just one child, then we've done good."

Groundbreaking Measures

Pat Songer launches system redesign

Pat Songer, NREMT-P, ASM, has always had a passion for public service and a desire to direct that passion to the underserved, and sometimes overlooked, EMS agencies in rural America. Working now in Winnemucca, Nev., two hours east of Reno, Songer, director of EMS for Humboldt General Hospital, has developed and launched some of the most influential programs and initiatives that region has ever seen.

The past five years have been particularly busy ones for the energetic EMS director. He has spearheaded the establishment of a critical care paramedic ground system, introduced a new clinical program to use portable ultrasound units in the field to detect internal bleeding and possible blockages in prehospital patients, helped provide handheld blood analyzers to the field, and launched a community paramedicine program designed to reduce ED visits and hospital readmissions. It's a pretty impressive track record, given that he's only been at Humboldt General Hospital for 6 1/2 years.

Pat Songer



Critical-Care Ground System

Establishing the critical-care paramedic ground system was, perhaps, one of the most crucial and ambitious programs on Songer's plate at the time. The closest trauma center from the hospital sat in Reno, 175 miles from Winnemucca, and required a patient needing critical care to be flown by helicopter for three and a half hours at a cost of \$28,000. Clearly, something had to change.

"Being in frontier Nevada, I've always felt that there was no reason we shouldn't be able to provide the same

level of care and the same quality of care that you get in a high-performance urban system like Reno," says Songer. "We needed to change the system and reduce transport times. We could do that and still get people the appropriate care they needed by doing more aggressive medicine."

So with the support of the chief executive officer, Songer led the hospital's EMS system redesign, complete with major ambulance and equipment upgrades, staff hiring and training, and strict schedule improvements. As a result, patient transport times have been reduced to a little more than two hours, and costs have dropped from \$7.8 million a year to \$1.4 million a year.

"We are getting people to definitive care quicker because we are integrated into the hospital," he says. "We went from three to 12 full-time paramedics, with someone who does full-time quality assurance. We are immediately notified when there is a potential for transport, so that we can be ready for it and leave immediately." In short, Songer says he's surrounded himself with an excellent team that produces quality results.

New Initiatives

As part of his five-year plan, Songer applied for and received a grant from the state of Nevada, through the University of Nevada Reno, to start a pub-

lic access defibrillation program to place 250 automated external defibrillators (AEDs) in government buildings, area businesses, churches and casinos. The hospital donated AEDs to all the public schools in the area.

"We encourage these businesses to purchase the units outright, and then we provide the training, medical direction and supplies at no charge for the life of the AED," Songer says. "Our hospital decided it's an important part of the community, and we needed to get everyone equipped."

The hospital also equipped the police and sheriff's departments. All officers are trained at an EMT or first responder level and respond to all medical calls. "This increases the survivability rates in those rural areas where getting to someone in four minutes is difficult."

Songer also introduced a new clinical program to use portable ultrasound units in the field, which can detect internal bleeding or possible blockages in prehospital patients. The units have allowed EMS responders to reduce decision-making time in the field, allowing patients to be transported to a trauma center faster.

"We have trained all of our paramedics in ultrasound, and then we partnered up with our radiology department to help us with our reads and keep us continually competent in the reads we do," says Songer. The reduced time in the field, along with the added support of radiology, has allowed paramedics to make treatment and transport decisions quickly, saving time, money, and lives.

"Now we can utilize the system better by appropriately bringing air medicine out when needed, or rendezvous on the way to a trauma center," Songer says.

Along with the ultrasound, Songer also introduced handheld blood analyzers to the field, which allows EMS

to quickly identify critically injured patients who need surgery. “We are using the units for everything from analyzing electrolytes to making better determinations on STEMI patients to the use of thrombolytic drugs in the field,” says Songer.

The changes that Songer and his team have implemented in hospital processes and procedures, as well as the equipment he has deployed in the field, are all part of an overall community paramedicine program he’s designed to help reduce ED visits and hospital readmissions.

Community Paramedicine

Humboldt General has been slowly developing its community paramedicine program during the past few years to address such issues as wellness in the community, flu shots, discharge summary follow-ups, medication reconciliations and education on diabetes control and inhaler use.

“The more preventive things we can do in the field, the less of a burden ambulances will be on the health-care system,” he says. “Conversely, the program can keep more patients out of the hospital and reduce the number of patients we transport. By doing preventive medicine in the field, we can keep our communities healthier, which ultimately will be a savings to all small, rural communities.”

Not only has the community

paramedicine program had an effect on Songer’s community, but it has also had an equal, if not greater, effect on the recruitment and retention of EMS personnel. Paramedics at Humboldt are put through a paramedicine course, a move that has been met with an enthusiastic response.

“They see this as the next step of their professional career and a way to provide a higher level of service to their community,” says Songer. “They are able to take care of their community, and the payback is 10 times what



Under Pat Songer’s leadership, a critical care ground system has been established in Humboldt County.

it is doing safety-related medicine. Because of this, I have very small turnover. Since I’ve been here, I haven’t had a paramedic leave because they don’t like the job.” Songer also attributes the success of his programs and the retention of his staff to the hospital’s focus on customer service. All of the tools and technology Humboldt uses is in service to its community, and residents are positively responding to the benefits.

“We get excellent feedback from the community, and they support us in all of our functions,” Songer says. “We are reducing the costs to our customers by the technology we are bringing into the field and the level of care that we are providing to them. People love it because they love being taken care of appropriately.”

Despite the significant inroads Songer and his team have made at Humboldt Hospital, he believes there is still more work to do. For one thing, he would like to see more emphasis paid to the needs of healthcare in rural America, which he sees as sometimes taking a backseat to the healthcare needs of more populated urban areas.

“My passion lies in rural communities and making sure they are taken care of,” he says.

“In many rural communities, we have paid physicians, and paid fire departments, and paid nurses, yet we still aren’t able to support paid ambulance and paramedic service to take care of community residents. Volunteerism is an important aspect to EMS, but we’ve got to do a better job of tying it all together. We’ve got to take better care of our people.”

To that end, Songer continues to advocate for the best possible care for both his rural community and rural communities across the nation. More than just advocating for rural healthcare, Songer sees his mission as advocating for his rural community family.

“I grew up in a rural EMS system, and I still believe in that small family relationship, no matter how big we are or how big we get,” he says. “Our goal is to provide high-level critical care to a very rural area. Our job is to take care of our community and produce good outcomes. We’re doing all of this so we can build a future for our community.”

Recognized for his efforts in formulating
a Community Paramedicine program in
frontier Nevada.

Creating an EMS Safety Net

Todd Stout builds intricate network via FirstWatch program

If you call up FirstWatch.net, you will see a dramatic opening on its website: “Bioterrorism. Epidemics. Crime Patterns. Operational Vulnerabilities. For any kind of threat, earlier detection means earlier action. Know first with FirstWatch.”

No, FirstWatch isn’t the latest movie starring Bruce Willis. Rather, it’s the state-of-the-art, real-time early warning system and company run by President Todd Stout.

The system could more closely be called a virtual EMS supervisor, a term coined by his colleague, Bruce Evans, the deputy chief of Upper Pine River Fire Protection District in Colorado.

“I built this system originally in 1998 to monitor EMS dispatch data in Kansas City,” says Stout. “We watched for statistically significant increases in certain kinds of calls, which could indicate signs and symptoms of a bioterrorist event.”

Almost 15 years later, the FirstWatch system has come a long way. The system today is a high-tech data mining and monitoring marvel, tracking EMS call activity for 118 agencies, or consortiums of agency sites, across the nation.

“We track almost 300 different agencies and get about 40,000 new public safety incidents a day, mostly EMS, into our data centers,” says Stout. “That’s one record every two seconds, but we get each of those records many times because we are polling those calls throughout the life of the call.”

The system electronically monitors and reports on everything from patient

care performance, ambulance and vehicle breakdowns, pediatric drownings, even accidents in traffic traveling to and from large-scale special events like concerts, sporting events, and other entertainment events. They are all tracked and recorded in real time.

Building a Network

FirstWatch looks for user-defined criteria or geographic clusters that pinpoint statistically significant increases. If found, the system sends out an alert to the company’s dashboard and then alerts EMS providers about the situation. In essence, FirstWatch is an EMS safety net.

“In the old days, dispatch and supervisors were less busy and had more time to listen to the radio and pay attention to what was going on,” says Stout. “Now everyone is just pushed so hard, resources are cut, and they end up in a spot where there is no reasonable way for humans to keep up. These are easy things for a computer to do, so it relieves the burden on humans.”

Take, for instance, Richmond Ambulance Authority. On certain days, EMS dispatch within the city noticed spikes in calls with people experiencing respiratory problems, and the agencies needed to find a correlation in order to stay ahead of the curve. FirstWatch helped them track the calls and ultimately determine the culprit: changes in temperature of 30 degrees warmer or colder. “When there is that fairly big change in tem-

perature, EMS knew they were going to get slammed with respiratory calls within the next several hours or days,” Stout says. “Once they figured that out, they started stocking extra oxygen supplies on those days.”

Or take the Tulsa, Okla., ice storm a few years ago, when dispatch calls spiked for carbon monoxide poisonings. When Stout’s FirstWatch team did a recalculation of the calls over a two-week period, something that’s easy for the system to do, they discovered that most of the calls were coming from predominantly Hispanic parts of the city. Further investigation revealed that the ice storm knocked out power, and people were trying to keep warm using barbecues and generators inside their home.

“They were killing themselves with carbon monoxide,” says Stout. EMS contacted the press and radio stations about the situation, and they asked residents to take barbecues and generators out of their homes and garages. That action precipitated a rapid decline in carbon monoxide calls. “We put all of that together in an hour with the information that was coming in from the EMS dispatch stations,” Stout says.

FirstWatch & the President

One of the more “exotic” parts of the FirstWatch system is its ability to draw a “geo fence” around a particular area that will, in essence, strip out routine EMS calls and focus on specific “triggers” that may be related to an event in the area. For instance, FirstWatch was deployed recently in Honolulu, Hawaii, at a conference attended by President Barack Obama. FirstWatch was used to draw two geo fences, one around the area of possible protesters and one around the area where attendees were staying.

“We set up the geo fences,” says Stout, “and then our customers

Todd Stout



watched everything in those fences a little closer. We pulled out other routine EMS calls and watched for bomb threats, fights, assaults and gastrointestinal problems that might indicate food poisoning situations.”

The geo fences can be used for tracking data in a geographical area, such as following parade routes in New Orleans during Mardi Gras, but they are also used to track clusters occurring anywhere within a predefined area and time frame. So, for instance, if the data reveals a geographical cluster of seizures within a close time frame, FirstWatch sends out an alert that something is amiss.

“That’s not normal because seizures are not contagious,” Stout says. “Something is causing them. So we can look for x number of seizure calls in number of miles within a certain time period. We can pick the wheat from the chaff and see what’s going on.”

Forging Partnerships

Currently, Stout and FirstWatch are partnering with Sabina Braithwaite, MD, MPH, and Sedgwick County EMS in Wichita, Kan., to take their monitoring beyond response time and performance improvement. For several months, medics have been capturing the hospital’s medical record identification numbers for patient billing and follow-up purposes.

“Now that we have all that data, we can tie every call they take and every patient they respond to, from dispatch, to what the medic found, to the patient’s condition at emergency room discharge, into the hospital or out into the world,” says Stout. “From a research perspective, that opens up a constantly changing batch of information that people typically had to manually tie together. How much healthcare improvement can be done from that?”

Stout’s goal is to eventually standardize all the data so that it can be analyzed and reported in meaningful ways. “We’ve been doing this for more

than a decade, and none of that standardization exists,” he says. “We now have this structured framework, a system, and a process to grab that data, bring it in and analyze it.”

This, in turn, will help FirstWatch provide a better data-capturing platform for his customers. “I can’t

guess what a customer’s needs are from a data perspective; I don’t know what their medical directors are after, and I don’t know exactly what their challenges are,” he says. “Our business model is to put our system in place and then work with the agency to give them what they need.”

Customer Appeal

Stout is quick to point out that his customers’ needs drive the way data is captured, measured and reported. “They don’t need me to come in and say you have to capture the data this way to make it work,” he says. “We approach it from the perspective of best practices shared, and we show them what other geographic regions do in monitoring and reporting data.”

Beyond just collecting data for monitoring and reporting purposes, Stout sees the real value of the FirstWatch system in its ability to improve clinical quality. If prehospital providers can use the data to link their own performance to better patient care, so much the better.

“If I’m a medic, and I know if I do ‘X,’ it does this, and I do ‘Y,’ it does that, and somebody tells me that right after I do it, then it will stick in my head, and I will do a better job,” he says. “This will help us know about patients. We’re going to know what’s happening with them, and I’m going to be able to make improvements in my skills and approach to make patient care better.”

Recognized for his efforts in tracking some 300 different agencies via real-time warning system.

to do the right thing. Real-time data reveals real-time problems, and real-time solutions. Quickly sharing that feedback can mean tightening efficiencies, resulting in real cost and life savings.

“We can take the burden off of prehospital dispatch and field providers and help make their jobs easier,” he says. “Let the computer do what the computer does really well, and let’s save the humans for things that it takes human brains to do. I know how EMS people function and think for the most part, and our team can take good care of them.”



Todd Stout's FirstWatch program tracks almost 300 different agencies and logs about 40,000 new public safety incidents a day.

The real-time monitoring—and feedback—lies at the heart of the success of FirstWatch. Stout stresses that prehospital providers want to do good work, and they want

Blazing a Trail

Wilderness EMS team creates EMS medical director course

By law, all EMS providers must operate under the medical oversight of a licensed physician. However, most physicians have little wilderness medical experience, and there hasn't been specific training has been lacking for physicians in providing this type of oversight in a wilderness environment. Until now.

Michael Millin, MD, MPH, Seth Hawkins, MD, EMT-P, and Will Smith, MD, EMT-P, have developed a unique and innovative wilderness EMS medical director course that brings EMS medical education and awareness to physicians and other prehospital providers who might not otherwise have a chance to be exposed to such information.

Wilderness EMS team



The course is the brainchild of Millin, who lives and works in Baltimore, but finds himself in his off time hiking in a nearby rural area. On one such hike, he was reminded of an idea that he had been carrying around since his days of working as the medical director for the National Ski Patrol (NSP). The idea, that an urban EMS provider might not have the needed wilderness medical skills to attend to someone injured in such a rural area, stuck with him.

"You need someone with specialized skills and equipment to be able to get someone out of a place like that," says Millin, who is an assistant professor of emergency medicine at Johns Hopkins University School of Medicine, the medical director for Johns Hopkins Critical Care Transport Program and the medical director for Baltimore Washington International Airport Fire & Rescue.

An Idea Spreads

The more he thought about it, the more intrigued he became with the idea. He wasn't able to get the idea off the ground while at the NSP, but it seemed now, five years later, that the idea was ripe for fruition. He invited colleagues Hawkins and Smith and a few select others to join him in trying to bring the idea to light.

"EMS is anywhere patient care is delivered, and we recognized a disconnect in medical oversight, where wilderness medicine was concerned," says Smith, who has had extensive prehospital EMS experience before going to medical school and is president and medical director of Wilderness and Emergency Medicine Consulting, based in Jackson, Wyo. "It's becoming recognized that EMS starts when patient care starts, no matter where that is. And we need to make sure that all parts of the system work together, rural or urban."

Millin now holds a leadership position with the National Association of EMS Physicians (NAEMSP), and brought his wilderness EMS training idea to the operations committee as an educational program. "They thought it was a great idea," he says. "Eight people from the committee, who had interest in EMS, got together with me to form this program."

Curriculum Development

Millin, Hawkins and Smith developed a curriculum together and presented it to NAEMSP and the Wilderness Medical Society (WMS) as a collaborative course, and the organizations enthusiastically embraced the idea. It's the first such formal collaboration between the two organizations. All three are members of both organizations.

Forty-three students attended the first course, which was offered this past November in Tucson at the WMS desert medicine meeting. "We weren't sure how many people we were going to have, or if it would even be feasible or doable," says Smith. "We ended up with 43 students in the class, which blew us away."

The 16-hour curriculum is intended to be a weekend course, but can be flexible, depending on the need of participants. "For now, we will be delivering the course in association with other conferences offered by NAEMSP or WMS," says Millin. "It will be a shared program between the two associations, and the three of us will be course directors delivering the course."

The course consists of historical development of EMS and wilderness medicine, logistical considerations in systematic EMS response in a wilderness environment, a review of field care for specific emergency medical conditions, legal issues, and the role a physician plays in wilderness EMS. The next course offerings are slated for January 2013 at the NAEMSP Conference in Florida and the summer 2013 WMS conference in Colorado.

In developing the course, the three took a collaborative approach—among themselves and among others who wanted to participate in the curriculum development: "Everyone submitted ideas for the curriculum, and everyone had an equal voice in debating what they thought was most important to include in the curriculum," says

Hawkins, medical director of the Burke EMS Special Operations Team. “The idea was to try to avoid loud voices or big names in steering where the curriculum went. This was a more scientific way of coming up with a curriculum.”

The core goal of the course is to bring training and knowledge of wilderness medicine to medical personnel who have had little or no exposure to such medicine. “The American Board of Medical Specialties recognizes that physician care and a hands-on understanding of what’s going on in the field of EMS can make a big difference to the overall medical oversight of any system, whether or not it’s wilderness or urban,” says Smith. “The more physicians are hands-on out of the field, the more they understand the constraints and the ways to improve the system.”

To make this goal a reality, and to bolster the success of the wilderness EMS medical director course, sharing is the centerpiece of the curriculum, particularly when it comes to cross training. “What we realized was a lot of physicians and EMS personnel had a lot of medical experience, but didn’t have a lot of experience working without traditional equipment,” says Hawkins. “Or, there’s great outdoors people, who have no clue about EMS.”

So the curriculum was designed specifically to bring these two factions together in a way that both could share and learn from other’s experience. “There’s EMS content for people who aren’t really familiar with field medical care, and there’s wilderness content and outdoor and equipment-based training for people who have great EMS backgrounds, but who are not as familiar with the outdoors,” Hawkins adds.

To give credibility to the course, Millin, Hawkins and Smith developed the curriculum with standardized elements drawn from the Delphi Methodology, which is a structured communication and scientific research tool developed by the RAND Corporation. Essentially,

it takes the opinions of a panel of experts, who provide those opinions anonymously and without access to other opinions, to come to an expert consensus of opinion.

“We want EMS care to be equal throughout all care environments,” says Hawkins.

“So we wanted to be sure that the paramedics providing care in the wilderness are following the same degree of quality management, quality assurance and medical oversight as they would in the city.”

Delphi Methodology

The Delphi Methodology provided the opportunity for the curriculum to be both engaging and as scientifically rigorous as possible in terms of development. “We identified experts who gave me their thoughts on what should be in the curriculum,” says Millin. “From there we developed the core content, and then we all flushed out the full curriculum.”

The drive to develop the course comes from recognition for a need for consistency in the care of patients, says Millin. “Pathophysiology of disease is the same no matter where you are, so if you’re having a critical illness in the middle of the streets of Baltimore, or you’re having a critical illness on the top of Mt. Hood in Oregon, you should receive the same quality of care.” This means that all patients, regardless of where they are, should be managed by EMS providers who have been trained with a nationally recognized education and a defined scope of practice, are held to a standard of practice with a robust quality improvement program, and ultimately function under medical oversight,

he adds. “It’s a concept that has been long in coming, and to see these two associations support it is really exciting.”

Collectively, Millin, Hawkins and Smith feel

that the Wilderness EMS Medical Director course is about improving quality of care delivered to patients in the wilderness and the role that physicians play in that process. “Wilderness EMS is ‘real’ EMS, and as such, should have physician involvement,” says Millin. “Our course is really about training physicians to become active in medical direction for wilderness EMS programs, and we want the focus to be on the partnership, which has been formed between NAEMSP and WMS.”

The three course directors are passionate about EMS and passionate about wilderness medicine. These passions drive them, and will drive the course, to continue to be successful. Their ability to combine the transcendent beauty of the wilderness with the need for state-of-the-art medicine into a collaborative partnership with physicians and prehospital providers is unique, much needed, and will ultimately have a significant effect on many lives.



The Wilderness EMS team teaches EMS medical education and awareness to physicians and prehospital providers.

Recognized for their efforts in using Delphi Methodology to develop a unique wilderness training curriculum.



What if you could
increase your hands-on
time by nearly

25%

With the Physio-Control System of Care, compression and ventilation data gathered by our LIFEPAK® 15 monitor/defibrillator, transmitted through the LIFENET® System, and reviewed post-event with CODE-STAT™ 9.0 software can help you improve your compression fraction—and change outcomes for your patients.

Redmond Medic One increased their
hands-on time by almost 25% with
the Physio-Control System of Care.

Read or download the case study at:
www.physio-control.com/systemofcare

Capture it. Measure it. Improve it.

Schedule a demonstration today and see what it can mean for your team.

  www.physio-control.com/systemofcare

©2012 Physio-Control, Inc. Redmond, WA 98052 USA. All rights reserved.



INNOVATORS IN EMS
2011

