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### Partnering Medicine and Public Service



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### Interview With Professor Paul E. Pepe

Paul E. Pepe, MD, MPH, is Professor with Tenure in Internal Medicine, Surgery, Pediatrics, Public Health & Emergency Medicine (EM) at UT Southwestern and the City of Dallas Director of Medical Emergency Services for Public Safety, Public Health & Homeland Security. Up until this spring, he served for more than a decade as the jurisdictional Medical Director for the regional EMS system (about 250,000 annual emergency incidents, involving about 3,000 paramedics/first responders in Dallas and 18 surrounding cities) and he was recently appointed to become Regional Director for Out-of-Hospital Mobile Care Systems and Disaster/Event Preparedness at the University, a state government institution. For the past three and half decades, he methodically brought critical care medicine to the streets of North America in cities such as Seattle, Houston and Dallas where he has practised on-scene prehospital medical care and conducted ground-breaking investigations. Prof. Pepe joined the Editorial Board of ICU Management in 2014.

**Over the past 18 years, you have combined an academic chair role in emergency medicine with public service roles in emergency medical services. How does practice inform research in these roles?**

Participation in academia and in public service is complementary in many ways. In academia, our purpose is to scientifically make improvements in patient care and teach those advances to the trainees, but, in the end, the mission is to serve the public. Public officials are, de facto, serving the public, and so there is a common mission. I have been very fortunate to work with visionary elected and managerial public officials, who have seen the benefits of working hand in hand with academia. The academic world has the tools to study, document and verify appropriate uses of public resources. This is not only facilitated by researchers who routinely evaluate interventions scientifically, be they medical care or procedural innovations, but also by their ability to secure extramural funding and grants.

When you have visionary public officials, those changes can be implemented more rapidly, particularly when the data are generated to back up the funding needs and resource allocation. A classic example is in the arena of resuscitation medicine. Public resources (e.g., paramedics and first responders) can be used to research how to save more lives in the realm of cardiac, trauma and STEMI resuscitation as well as stroke recovery and a myriad of other critical illnesses and injuries. In order to conduct scientific studies in patients with these critical conditions, it often entails the need to implement an exception to informed consent (ETIC) due to the nature of the life and death decisions that need to be made within minutes – or even seconds. Even if the family were present, any consent would be given under duress and therefore would not be considered truly informed consent.

In turn, there are now accepted policies to provide ETIC under such circumstances. Nevertheless, to politically, sociologically and ethically conduct a study involving ETIC, it is critical to have the involvement and prospective knowledge and consensus of public officials, the medical community, the media and other advocates for our patients.

By being an integral and trusted part of local government, one can communicate and interact with other public officials, the media and public health officers on a regular basis, thus facilitating that trust and a working knowledge of activities. This is very important because public leaders are incredibly busy and are continually bombarded with multiple other proposals to analyse. To have a daily interface, even if briefly, enhances the ability to get things explained, accepted and accomplished. For example, we had an incident where we were going to be dismissed from a particular clinical trial by the national centre because of lack of compliance in a particular metric. A single phone call to the lead public official in the city was able to turn things around by prioritising the focus on meeting those compliance standards despite being in the midst of budgetary crisis. That would not have happened had I not been part of that government organisation on a day-to-day basis and gained the respect and confidence of the final decision makers.

This association between academia and public service also benefits the tax-paying citizens at large, because our ability to bring in extramural grants means that we can implement changes and obtain new life-saving equipment and monitoring devices to help better document the life-saving interventions and procedures. As a result, over the past ten years, we have been able to demonstrate dramatic improvements in survival for conditions such as cardiac arrest, STEMI, stroke and trauma and at no direct cost to the citizens in our community. It is a public official's dream to be able to improve public safety and public health without costing anything, so a mutually beneficial two-way street is facilitated by my living in those two worlds simultaneously.

**You are on record as “proud to serve” as a public servant. You are also generous with your time in talking to mass media. Why are these roles important for a physician?**

When people ask what I do for a living, the reply that comes to mind first is “I’m a public servant”. I have worked for state and/or municipal governments for the last 30 years. It just happens that I have some special talents or competencies in the realm of medical care. Even if I were not working in government, I still see my role as a physician as providing service to the public.

In Dallas, we have partnered with the mass media in our efforts to study life-saving interventions. Long before we began to do clinical trials, I started working with the county and city governments and news media alike. Even then, I was explaining to them the inadequacies of historical controls and why you need prospective controlled studies. We also educated them how the design of clinical trials would not only be done in a fair manner, but that everyone, including traditionally underserved populations, would get equal access. In other words, everyone gets a 50/50 shot at the new intervention regardless of who they are.

Most importantly, we have documented dramatic improvements in outcome for the control group simply because of implementing the trial. When I introduce any new studies we are doing, I always explain what happened with the last one. Consistently, and regardless of the study outcome, the survival chances go up for everyone who was enrolled, whether they were in the control or study group. Also, when I am examining the ethical and scientific decisions about whether I should conduct a trial, I always ask myself, “Would I enter my child or my mother in this study?” When I can truly feel that way and articulate it accordingly, there is immediate “buy-in” now.

Armed with the prior study’s data and earning their trust over the years, it helps me to accomplish even more life-saving – all because I had established longstanding routine interactions with other public officials, the media and, in turn, the public at large.

In terms of a specific new study, education of media and public officials cannot be done by someone they barely know in a quick sound bite manner, whether for a first-time press conference or for a public committee meeting. One needs to educate those public advocates well ahead of time. I usually do it one-on-one with each of them, making the rounds to each TV news director or city council member. Eventually, I usually bring these leaders together in a closed conclave in one room for what I call the Dallas community consultation committee. The committee is made up of news directors, elected officials, congress members, county supervisors, the medical society and public health officials. We actually have great discussions and everyone loves to come to these meetings of the minds. We have convened this group, not only regarding research, but also to talk about things like what are we going to do if there is a big pandemic or nuclear explosion and how we plan to organise – and triage – in mass critical care scenarios. Because of these thoughtful joint discussions about these sensitive issues, we have helped to pre-empt knee-jerk responses to well thought-out strategies. Instead of being criticised after the fact in a very shallow way that we are creating ‘death panels’, or that we are experimenting and treating people like ‘guinea pigs’, these public advocates come to better understand the process, intent and wisdom of what we are planning – and not under the duress of an actual event. More importantly, they help to guide us in a very responsible manner. They know how carefully we arrived at some very difficult conclusions. Accordingly, I make sure that it is well known that the public officials and the media were partners in the life saving effects in this community and that they should be credited for their wisdom and visionary involvement.

Also, I often point out that in day-to-day emergency care, the treatment you might be provided is generally not known to the average person or that it may be altered depending on the practitioner involved. When I do the study, however, the protocol is public record and people know exactly what we are going to be doing. So the care provided is quite transparent. Secondly, everybody in this community, no matter what background they come from, is treated the same way. For example, when we talk about the issue of mass critical care in which we may have to make some very difficult triage decisions, we point out that our consensus-based protocols are available to the public at large and everybody will be treated the same way. In other words, wealth will not determine the level of care. Instead, we created a level playing field and this engenders additional trust. Again, pre-emptive education of the community consultation committee members will help to significantly mitigate mistrust in a future crisis.

**What should future priorities be for cardiac and resuscitation research?**

What I am currently working on involves different ways to actually improve flow even further. I am beginning to focus on situations in which there has been a really serious anoxic insult, particularly in those who have had a long cardiac arrest interval, say 5, 10, or 15 minutes without any intervention.

In the past, such conditions would have been seen as irretrievable. However, our new intrepid experiments show a different way of thinking about things – instead of a focus on restoring an adequate coronary perfusion pressure, I am thinking about restoring better coronary and systemic *flow*.

Without getting into the specifics of what we are doing, I would simply point out that we now believe that we may indeed be able to resuscitate and send home persons neurologically intact despite such anoxic insults. Consequently, we will increase survival rates even further because we are dealing with a very large population of patients who currently do not survive.

**What are the most promising technologies for EMS?**

We are now beginning to show that quality CPR monitoring devices and flow-enhancing adjuncts, such as the active compression decompression pump and the impedance threshold device, improve outcomes. Another technology that shows promise is Trans-Oesophageal Echocardiography (TOE), because it may help us to see if the heart is still beating in the absence of a detectable pulse. Also, if we see that the heart is not beating we can feel more comfortable in terminating resuscitation efforts. The most interesting and latest twist is that, with TOE, you may find the most optimal position to place one’s hands in order to improve the vector of the outflow during CPR. Perhaps, eventually, with other adjuncts, we will be able even to look at how we are improving blood brain flow. In terms of the quality of CPR, we really have started to do some fine tuning that has saved lives. For example, the so-called “sweet spot” of chest compression rate might be around 110 with standard CPR, but with adjuncts such as the impedance threshold device, that rate might be 90.

**How do you define success in an EMS/ICU director?**

One of the things I have learned is that where we thought that improved survival rates, improved protocols and cost-effective procedures were traditionally thought of as defining success of a medical director for a critical care unit, whether the unit is a typical ICU unit or one out on the

streets, success is actually how you deal with and navigate through the daily political, and/or logistical problems that come up – whether it's patient complaints, budgetary obstacles or bad interactions with colleagues. How you handle those different obstacles on a day-to-day basis is what really defines a good leader. Some might also say that critical care medical directors (be it EMS or ICU) who handled those obstacles and challenges well served for long periods of time and thus were able to have the better opportunity to improve outcomes. Leadership doesn't require just being a nice person. It also requires being competent, having the data and at the same time being willing to understand the other person's side and needs and being able to accomplish mutual goals for the patient's sake. Ultimately it means being seen as a sincere patient advocate and not just someone looking out for his or her own needs. Simply, you are a team looking out for the patients. What defines a good leader is basically a person who is trusted.

### **You say that a gram of good pre-hospital care saves a kilogram of ICU care. Why is that?**

My mantra over the years has been, "the earlier the intervention, the better the results". For example, we introduced automated defibrillators at the airports in Chicago fifteen years ago. In the first year of implementation all nine people who collapsed in the counter and gate areas, where we had placed devices, survived neurologically intact. Most of them were waking before traditional EMS arrived. In the past, even if there was bystander CPR and rapid resuscitation by the medics, the patients still would be in a coma and remain in coma requiring intubation and mechanical ventilation in the ICU. Half of them would wake up — and half of them would not. Now, with such an intervention being provided so much earlier, by the public no less, it is a profound experience when every one of them is not only saved, but is waking up before arrival of paramedics. That was a classic example of "the earlier an intervention the better the results" and also the corollary, "a gram of good prehospital care saves a kilogram of ICU care" (Caffrey et al. 2002).

Another example is using Continuous Positive Airway Pressure (CPAP) in the field; we have learned that if we introduce CPAP early on we can prevent intubations. This means not only taking CPAP to the streets and in the ambulance, but into homes. With portable CPAP devices, we were able to prevent several hundreds of people from being intubated, once again because the earlier the intervention, the better result. By acting, literally within minutes, before the flash pulmonary oedema can progress too far, it is easier to reverse. The reason why this is so important is that it not only spares ICU resources, personnel and equipment, leaving ICU beds open, but it also prevents complications such as ventilator-associated pneumonia (VAP). As we are supposed to be accountable care organisations nowadays, this intervention does exactly what we want; we save money, spare resources and decrease the incidence of complications such as VAP. But, most importantly, we improve patient satisfaction. If this was my mother and she suddenly has flash pulmonary oedema and is drowning, she is terrified. But, then, if we have to come along and put a tube in her lungs in a very dramatic moment at the hospital, because of progressing lung and heart failure, she may ask to just let her die next time. Instead, today, we can come along and put a noninvasive mask on the patient's face, and in moments they begin to feel much better.

In the end, that to me is what it is all about — providing better care for our patients and not just better management or treatment for our patients.

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