

Testimony of
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Subcommittee on Emergency Preparedness, Response, and Communications**

On

“Agents of Opportunity: Responding to the Threat of Chemical Terrorism”

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Chairman McSally, Ranking Member Payne, and distinguished members of the Subcommittee, thank you for the opportunity to appear before you today. I appreciate your interest in the state of preparedness and response efforts of the healthcare system regarding chemical terrorism. I am honored to testify with my distinguished colleagues Dr. Kirk, Chief Bryant and Sheriff Fontoura.

I am an emergency physician at Johns Hopkins Hospital in Baltimore and the Associate Director of the Johns Hopkins Office of Critical Event Preparedness and Response (CEPAR), founded in 2001 in response to the terrorist attacks. Our office oversees preparedness planning and disaster response for all of the Johns Hopkins Institutions, including the Johns Hopkins Health System and the University. CEPAR’s other focus areas include policy development for the Institution (e.g. smallpox vaccination, scarce resource distribution during pandemic influenza, and Ebola response) and disaster education and training, not only for the Institution, but also nationally and internationally.¹ In addition, we are home to the National Center of Excellence for the Study of Preparedness and Catastrophic Event Response (PACER), created by the Department of Homeland Security (DHS). PACER’s research portfolio includes surge capacity metrics, modeling and simulation, and development of decision support tools.²

I have been an emergency physician for 20 years and an expert in disaster medicine and healthcare system preparedness and response for nearly 16 years. I have responded in the field to disasters such as Hurricanes Ivan (2004), Katrina (2005), and Rita (2005), the Haiti earthquake (2010), and Hurricane Sandy (2012). I had the honor of serving on the FEMA National Advisory Council for three years and am the Senior Medical Officer for Maryland’s federal Disaster Medical Assistance Team (MD-1 DMAT). My additional experience in the area of chemical response includes serving as a subject matter expert on a number of Department of Homeland Security (DHS) and Department of Health and Human Services (HHS) projects pertaining to chemical, biological, radiological, nuclear and explosive (CBRNE) event

¹ www.hopkins-cepar.org

² <http://www.pacercenter.org/>

preparedness. I have authored multiple research publications on healthcare and terrorism, including the state of preparedness, the willingness of healthcare providers to respond, and training and education of staff. In addition, I served as a subject matter expert in 2004 and 2011 to Meridian Medical Technologies (originally King Pharmaceuticals), producers of nerve antidote auto injectors, on the topics of public awareness and establishment of medical training and readiness.

Background

My awareness of preparedness gaps related to the threat of chemical terrorism began in 1999, when I attended the Army's *Domestic Preparedness* training program. Thereafter, I became committed to improving my hospital's level of preparedness and making this a focus of my academic career. At that time, our emergency operations plan did not address the unique issues and needs related to a chemical event, so I drafted the first chemical response plan for Johns Hopkins Hospital. Our decontamination capability at that point was comprised of rudimentary personal protective equipment (PPE), a plastic baby pool and a garden hose.

September 11th and the subsequent anthrax attacks dramatically changed the healthcare system's perception of our vulnerability to these emerging threats and spurred a paradigm shift preparedness activities. Over the next several years, federal Hospital Preparedness Program (HPP) funding became available to hospitals, which allowed us to bolster our preparedness for acts of terrorism, including biological, chemical and radiological events. We used initial HPP funding to purchase portable decontamination tents and/or install permanent decontamination showers, to buy appropriate PPE for our staff, and to stockpile antidotes. We began training our healthcare providers on implementation of the chemical response plan and the use of the equipment. We expected an accelerated pattern of attacks, and we felt more prepared. Fortunately for the United States, no further attacks have occurred.

Current State of Preparedness

Are hospitals currently prepared to manage and treat victims of a chemical attack? The question is difficult to answer. There is surprisingly scant information on the current state of preparedness of hospitals and healthcare systems for chemical events. In the years following the events of 2001, a number of reports and studies reported a deficit in preparedness efforts of hospitals with regards to chemical and biological agents;^{3,4,5} however, given the age of the data, it is difficult to determine its accuracy or applicability to the state of preparedness of the healthcare system today. In addition, a standard definition of "preparedness" for chemical

³ GAO Report to Congressional Committees. Hospital preparedness: most urban hospitals have emergency plans but lack certain capacities for bioterrorism response. August 2003.

⁴ Bennett RL. Chemical or biological terrorist attacks: an analysis of the preparedness of hospitals for managing victims affected by chemical or biological weapons of mass destruction. *Int J Environ Res Public Health*. 2006; 3(1): 67-75.

⁵ Niska RW, Shimizu IM. Hospital preparedness for emergency response: United States, 2008. *National Health Statistics Reports*. Mar 24, 2011: Number 37.

terrorism is lacking, although researchers have called for the development of disaster preparedness and emergency management metrics.⁶

As the years have passed since 9/11, the healthcare system's attention to the matter of preparedness has turned to other types of disasters, such as emerging infectious diseases and natural disasters. The steady stream of funding for CBRNE preparedness given directly to hospitals has slowed significantly in the last 10 years. For example, Johns Hopkins Hospital received \$352,596 in HPP funding in 2004; in 2014, we received \$35,000. HPP funding is now distributed to State health departments rather than to hospitals; in addition, the funding has become less discretionary and more directed.

In addition to diminishing HPP funding, hospital budget constraints and competing priorities have limited the replacement of damaged or expired supplies, equipment and antidotes. In the world of just-in-time purchasing, items needed for relative rare events fall low on the priority list. Decontamination equipment and PPE is slowly degrading due to lack of use. Chemical cartridges and antidotes are expiring. Our current stockpile of chemical antidotes is minimal, and our reliance on the Strategic National Stockpile's Chempack has grown.

Training of staff for chemical events has essentially fallen off the radar screen of hospitals. While patient care is what we do every day, response to a chemical event is not intuitive: assembly of the decontamination tents, correct donning and doffing of PPE, proper patient decontamination procedures, and familiarity with chemical agent symptoms and treatment are perishable skills that require ongoing training to maintain. According to 2008 data, only 69.6% of hospitals had performed an exercise involving decontamination procedures, and only 55.6% of hospitals had participated in a mass casualty drill involving a chemical accident or attack scenario.³

Healthcare providers' experience with managing victims of agents of opportunity is extremely limited. I myself have only seen one victim of organophosphate exposure in 20 years of practice (which was due to a farming accident, not terrorism). Experience with industrial accidents and hazmat events are the closest approximation that first responders have to chemical terrorism response. However, large-scale hazmat events are relatively rare, and even seasoned emergency physicians have little if any experience in this kind of response at the hospital level.

Given the current lack of focus on chemical response in medical education, we are raising a new generation of care providers who are naïve to the threat of chemical terrorism. Our medical residents were in elementary school when the sarin gas attacks occurred in 1995, and our medical students were preschoolers. Most emergency medicine residents receive only one hour of education on CBRNE agent awareness training during a two-year curriculum rotation. Medical students may receive only one hour of CBRNE information (if any) during their 4 years of medical school. Unless residents or medical students seek independent study or participate in a chemical drill at our hospital, it is unlikely that they will be familiar with the initial

⁶ McCarthy ML, Brewster P, Hsu EB, MacIntyre AG, Kelen GD. Consensus and tools needed to measure health care emergency management capabilities. *Disaster Med Publ Health Prep.* 2009: S45-S51.

management of a chemical event or patient decontamination procedures when they enter into practice.

Moving Forward

So where do we go from here? First, we need to redefine the problem, which requires research funding. We need new data that accurately reflects the level of hospital preparedness for chemical events today so that we can identify gaps and redirect HPP funding where it is most needed. Furthermore, we need to expand current research on hospital preparedness metrics⁷ and core competencies in disaster response⁸ to specifically address chemical preparedness and response. Through this information, we can establish benchmarks, which provide us with the objectivity needed to measure our success on the very question before us today.

Second, ongoing training and education of healthcare providers in chemical response is critical, but there are some barriers to this concept. At the hospital level, training equals time and money. At the medical education level, medical student and resident education curricula are already extremely rigorous, and there is little flexibility for addition of new topics or expansion of existing subjects. New training and education endeavors for healthcare providers will need to be time-efficient and cost-effective in order to be adopted. As an example, one available model is the CDC's new online learning experience for emergency department personnel who treat patients with infectious diseases entitled *Ebola Preparedness: Emergency Department Guidelines*,⁹ developed in conjunction with the Johns Hopkins Armstrong Institute of Patient Safety and Quality.¹⁰ The training series prepares health care workers to safely and efficiently identify, triage and manage Ebola patients. In addition, the modules showcase important planning processes, provider-patient communication techniques and cross-discipline teamwork principles that can be used to successfully prepare for emerging infectious diseases. In order to incentivize hospitals to accomplish their chemical event education goals, completion of training programs and/or chemical-specific disaster drills should be linked to HPP funding or Joint Commission emergency preparedness standards.

Third, the healthcare system is missing the information we need to understand our vulnerability to these threats. All hospitals are required by the Joint Commission to perform a hazard vulnerability analysis for their region. We have a general awareness of regional chemical plants or nearby railways that may be carrying hazardous materials. We list "chemical attack" as a potential threat on our grid, but have no further information. In order for hospitals to accept the concept that agents of opportunity are a relevant threat, we need to understand what makes it so. Hospitals should partner with the intelligence community in order to increase information sharing (to the extent possible) and to develop more informed threat-based risk assessments so we understand where to direct our efforts.

⁷ Bayram JD, Zuabi S, Subbarao I. Disaster metrics: quantitative benchmarking of hospital surge capacity in trauma-related multiple casualty events. *Disaster Med Public Health Prep.* 2011 June; 5(2):117-24.

⁸ Walsh L, Subbarao I, Gebbie K, et al. Core competencies for disaster medicine and public health. *Disaster Med Public Health Prep.* 2012; 6:44-52.

⁹ <http://www.cdc.gov/vhf/ebola/healthcare-us/emergency-services/emergency-department-training.html>

¹⁰ http://www.hopkinsmedicine.org/armstrong_institute

Lastly, the importance of regional chemical preparedness initiatives, such as the *Baltimore Demonstration Project* described by Dr. Kirk, cannot be underestimated. Such projects enhance healthcare capabilities through both technology and collaboration. The new chemical detection equipment in the subway system under Johns Hopkins Hospital gives us the critical lead time that we need to respond effectively: to secure the entrances of our hospital to prevent loss of this critical infrastructure, to mobilize hazmat resources and decontamination equipment, to safeguard first responders and our staff with PPE, and to ready the life-saving treatment necessary for victims. More importantly, the initiative has engendered collaboration, communication, coordination and relationship building with our community and state response partners, such as the MD Transit Authority, Police, Fire, EMS, and hazmat teams, which significantly enhance our chemical event regional response capability.

Conclusion

In conclusion, hospital preparedness for chemical terrorism has improved since 2001, but we cannot allow our achievements to erode due to complacency. The time has come to abandon our reactionary stance to critical events and assume a more forward-leaning posture in preparing for agents of opportunity through implementation of thoughtful preparedness initiatives such as research, education and training. To quote General Pershing after WWI, "...the effect is so deadly to the unprepared that we can never afford to neglect the question."