

Translating Battlefield Practices to Disaster Health

Kandra Strauss-Riggs, MPH; Kevin Yeskey, MD, FACEP; Aubrey Miller, MD, MPH; Stacey Arnesen, MS; Craig Goolsby, MD, MEd, FACEP

ABSTRACT

We review aspects of the recently released National Academies of Sciences, Engineering, and Medicine report *A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury* most relevant to disaster health, particularly the concepts of focused empiricism and building a learning health system. The article references battlefield success utilizing these concepts and the emerging Disaster Research Response Program. We call upon disaster health researchers to apply the report's recommendations to their work. (*Disaster Med Public Health Preparedness*. 2017;11:510-511)

Key Words: research, learning health system, military translation, focused empiricism

In June 2016 the National Academies of Sciences, Engineering, and Medicine (NAS) released a seminal report entitled *A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury*.¹ The report's focus is to systematically capture and share knowledge and practice to save lives following traumatic injury. Several points from the report, particularly the discussion of focused empiricism and a learning health system, are worth the consideration of the disaster health community. These ideas appear ripe for translation to the disaster medicine world.¹

The military health system has documented tremendous advances in battlefield trauma care by employing focused empiricism.^{2,3} The NAS report defines focused empiricism as follows:¹

An approach to process improvement under circumstances in which: (1) high-quality data are not available to inform clinical practice changes, (2) there is extreme urgency to improve outcomes because of high morbidity and mortality rates, and (3) data collection is possible. A key principle of focused empiricism is using the best data available in combination with experience to develop clinical practice guidelines that, through an iterative process, continue to be refined until high-quality data can be generated to further inform clinical practice and standards of care.

An important example is the 75th Ranger Regiment's disseminated implementation of Tactical Combat Casualty Care (TCCC). This unit performs high-risk special operations missions in which fellow soldiers, rather than medical personnel, are often the key to saving lives. TCCC is a protocol designed and iteratively modified, using focused empiricism, during the wars in Iraq and Afghanistan to provide lifesaving

battlefield care. Once the 75th Ranger Regiment implemented TCCC, Kotwal et al³ showed that fatalities were dramatically lowered from 24% to just 3%.

In the disaster medicine community, we are similarly challenged by limited high-quality data and extreme urgency to improve outcomes. And, like our colleagues on the battlefield, we do have the ability to collect data. If the disaster medicine community can adopt similar willingness to rapidly develop guidelines using the best available data in combination with experience, and recognize that these guidelines should change iteratively with new information, the community might be able to further its impact on practice and outcomes.

Additionally, the NAS report outlines the concept of a "learning health system." The NAS defines this as "a system in which science, informatics, incentives, and culture are aligned for continuous improvement and innovation, with best practices seamlessly embedded in the delivery process and new knowledge captured as an integral by-product of the delivery experience."¹ In the disaster health community, we appreciate the post-event reports that laud the significant contributions of personnel who take heroic action to save lives and reduce injury. Some examples include those who evacuated neonatal intensive care unit patients at Langone Medical Center as Hurricane Sandy approached,⁴ those who saved numerous patients impacted by the Boston Marathon bombings,⁵ and colleagues who successfully treated Ebola patients.⁶ While celebrating these achievements is important, we hear far less about the failure points.

As outlined in the NAS trauma report, cultural barriers and fear of reprisal limit the sharing of challenges, which impedes learning from our mistakes.¹ After action reports (AARs) are the traditional means

of gathering information about a disaster response once events have concluded. AARs are often not shared outside the participating institutions, are collected in an ad hoc fashion, and may not effectively capture things that went wrong. This after action process often impedes our ability to candidly assess mistakes in order to make future improvements. Establishing a disaster learning health system focused on continuous scientific improvement and embedded in the delivery process could result in lives saved, as it might for the trauma system suggested by the report. A system, grounded in focused empiricism, where information is strategically and systematically collected, challenges are rapidly shared, and subsequent changes in practice follow, could advance the field of disaster medicine and likely result in better outcomes for disaster survivors.

Learning systems are avid for such information, digest it rapidly, and maintain “memory” over time so that the information accumulates and lessons are retained. Such an information environment has strong cultural characteristics, nurturing curiosity, disclosure, trust, and shared learning, as well as, crucially, minimizing fear.¹

As outlined in recommendation #7 of the trauma report, a key component of developing a learning health system is gathering credible data. In order to assess whether our practices in disaster health are having the intended outcomes of saving lives and reducing injuries, we must capture data in the midst of and immediately following an event.⁷ The work of the National Institutes of Health (NIH) Disaster Research Response Program (DR2) is focused on addressing many of the challenges associated with timely collection of health information in response to disasters. The DR2 Program has been developed by the National Institute of Environmental Health Sciences in collaboration with the National Library of Medicine to create a disaster research system consisting of readily available and standardized data collection tools, protocols, and guidance materials. A key tenant of the DR2 Program is community-based, participatory research, in which the community is engaged in the development of a research protocol to address local issues, assists with the data collection, and is involved in the interpretation of the data. DR2 also believes that disaster research must be integrated into the existing response and recovery infrastructure and commit to the principles of incident management. Additionally, the DR2 Program is working to create a trained network of researchers that can quickly respond to differing disaster situations to implement time-critical data collection and research studies.⁸

We encourage disaster researchers to review the NAS report in detail and to adopt the language and practice of a learning health system and focused empiricism. In particular, we recommend that disaster researchers nurture a culture of shared learning where it is not only safe, but commonplace, to discuss the aspects of disaster preparedness, response, and recovery that do not work well. Additionally, we recommend that the disaster research field move to more widely adopt the

principles of community-based participatory research. By leveraging the recommendations of the NAS trauma report and the ongoing lessons learned from the evolving NIH DR2 Program, the disaster health field can develop a true learning health system in order to save lives and mitigate the health impacts of disasters and public health emergencies.

About the Authors

The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc, and National Center for Disaster Medicine & Public Health, Rockville, Maryland (Ms Strauss-Riggs); MBD, Inc, Washington, DC (Dr Yeskey); National Institute of Environmental Health Sciences, National Institutes of Health, Bethesda, Maryland (Dr Miller); Disaster Information Management Research Center, National Library of Medicine, Bethesda, Maryland (Ms Arnesen); National Center for Disaster Medicine & Public Health, Rockville, Maryland, and Department of Military and Emergency Medicine, Uniformed Services University of the Health Sciences, Bethesda, Maryland (Dr Goolsby).

Correspondence and reprint requests to Kandra Strauss-Riggs, MPH, Operations Director, National Center for Disaster Medicine & Public Health, 11300 Rockville Pike, Suite 1000, Rockville, MD 20852 (e-mail: kandra.strauss-riggs.ct@usuhhs.edu).

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