U.S. and allies can learn from military medical lessons in Ukraine

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Dr. Aaron Epstein (center) is founder of the non-profit medical training organization Global Surgical and Medical Support Group (GSMSG). Credit: Dr. Aaron Epstein, Global Surgical and Medical Support Group

Delivering medical care to the U.S. and allied soldiers wounded in

combat has advanced significantly in recent decades. But an article recently published in the *Journal of the American College of Surgeons* asks: Will that medical delivery system be ready to manage potential future conflicts with an adversarial nation that has similar military capabilities to the U.S.?

"The way the U.S. military medical system is set up right now, we would not be ready for a major conflict like this," said the article's lead author Aaron Epstein, MD, MA, founder of the non-profit medical training organization Global Surgical and Medical Support Group (GSMSG).

Preparing for threats from near-peer adversaries

Based on interviews with dozens of medical personnel on the ground in Ukraine working with GSMSG, the article describes how future conflicts may differ and how the U.S. military medical system should prepare. The current threat from near-peer adversaries is at its highest level since the Cold War Era, the authors said. The term "near-peer adversaries" describes countries such as Russia or China, whose military and intelligence capabilities pose a significant challenge to U.S. dominance.

"The arsenals of near-peer adversaries are going to be much more lethal than what the U.S. encountered in the past, and the injury patterns are going to be much more severe," said Dr. Epstein, a fourth-year resident in general surgery at the University of Buffalo. Dr. Epstein, who founded GSMSG in 2015 as a medical student at Georgetown University, also participated in a roundtable discussion on "The Ukrainian Crisis: Surgical Lessons Learned" at the ACS Clinical Congress last year.

The hundreds of thousands of casualties in the war in Ukraine already exceed in volume and severity those seen in recent conflicts directly

involving the U.S., added Dr. Epstein, who highlighted the key challenges and lessons from the article. For example, a few soldiers with blast or penetrating injuries from an insurgent IED in Iraq or Afghanistan at infrequent intervals is far less of a challenge than enduring constant barrages of cruise missiles or massed artillery. When facing a near-peer adversary, every attack could turn into a mass casualty incident with dozens of injured patients at once. As a result of a higher volume and more devastating arsenal, traumatic brain injury, concussive injuries, and burn injuries may be far more prevalent in future conflicts, requiring specialized surgical and rehabilitation care.

Facing new challenges

Evacuating the wounded will also likely present a much greater challenge. In battles with insurgents, injured U.S. or allied soldiers are typically evacuated by ground vehicle or helicopter to a rear area hospital or medical facility. Because the U.S. historically could rapidly secure the area for medical evacuation, the threat to that evacuation aircraft or vehicle was generally limited., Dr. Epstein said. In a future conflict, a MedEvac helicopter might be kept away by sophisticated long-range surface-to-air missile systems.

"You will be facing more casualties with worse injuries, and now you don't have the ability to get them off the field," Dr. Epstein said. "What do you do?"

One response is to make prolonged field care a routine part of medical training for U.S. military personnel, according to the article. Although this training now is often limited to certain medical specialists within the military, the potential need for taking care of a severely injured soldier for days at a time requires many more soldiers to be trained in this skill, Dr. Epstein said.

Another challenge will be how to respond if advanced electronic jamming cuts off communications. In the field, there may be no way to call for a medical evacuation, which also speaks to the need for prolonged field care training. At a medical hospital, no communication means no way of anticipating or preparing for a convoy of vehicles about to drop off 30 casualties, Dr. Epstein said. As a result, the study argues that medical personnel need to be fully staffed and ready to handle traumatic injuries without much advance notice.

"Most civilian trauma surgeons have some experience with the frustrations involved in getting a trauma patient dumped off with no warning," Dr. Epstein said. "Magnify by 20 the number of patients, and also magnify the severity of the injuries."

Finally, it will be difficult to learn from the war in Ukraine without strong patient data. Although the U.S. collects data on casualties through the Department of Defense Joint Trauma System Registry (DoDTR), which aggregates data on combat casualty care epidemiology, treatments, and outcomes, a comparable database does not exist in Ukraine. Creating that registry will enable medical experts to provide proper planning and reaction for future conflicts against near-peer adversaries.

Current efforts

Among the efforts underway that will help fill the medical gap in a future war with near-peer adversaries are ACS programs, such as the Military Clinical Readiness Curriculum, to teach the basics of damage control surgery, damage control resuscitation, and emergency wartime operation, the article said. The ACS also collaborates with GSMSG to provide expert U.S. surgeons to partner with Ukrainian surgeons and provide education and training in combat trauma-specific topics like burn surgery, orthopedics, neurosurgery, plastic surgery, and others.

Since the start of the war in Ukraine, GSMSG, in addition to dozens of US special operations veterans, has had 60 surgeons (usually about four to six volunteers at a time) who have trained about 800 Ukrainian attending and resident physicians, either through lectures or hands-on training, and assisted in more than 300 operating room cases.

"The key takeaway and the real purpose of this paper is to have the U.S. medical system learn the lessons now and make the necessary changes, so that prior to any future campaign where we're facing a near-peer adversary, the lessons have already been learned and implemented," Dr. Epstein said. "If the lessons learned here can be taken to heart, you're looking at saving hundreds of thousands of lives."

More information: Aaron Epstein et al, Putting Medical Boots on the Ground: Lessons from the War in Ukraine and Applications for Future Conflict with Near Peer Adversaries, *Journal of the American College of Surgeons* (2023). DOI: 10.1097/XCS.0000000000000707

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