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Sustaining Military Surgeons and the Joint Trauma System

Current Efforts, Unique Challenges, and Proposed Strategies in an Era of Global Uncertainty

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SUSTAINING MILITARY SURGEONS

"Only the dead have seen the end of war" – George Santayana

Military medicine has two discrete, yet interdependent missions: the provision of beneficiary care and the need to provide an operational medical force to support global contingency military operations. Military medical teams do more than care for combat casualties, they also play a crucial role in responding to global pandemics and natural disasters and supporting the civilian response to various casualty events. Recent global developments have been ominous and unpredictable and demonstrate the need for a constant state of 'trauma readiness' in both military and civilian health care systems. While the United States currently is not engaged in any large-scale combat operations, the conflicts in Ukraine and Israel underscore the necessity for the United States to maintain a state of preparedness for injured warfighters and noncombatant care.

Two decades of continuous conflict have resulted in the Department of Defense (DOD) having a global trauma system: the Joint Trauma System (JTS). The JTS founded the principals of evidence-based performance improvement and uses these processes to not only improve clinical care along the battlefield and global continuum, but also inform policy, training, medical materiel, and doctrine. Despite many clinical and system improvements during the recent conflicts, there remain substantial challenges in both the deployed trauma system and maintaining individual clinical readiness that are requisite for global contingency operations. The imperative remains to sustain a competent trauma system that can manage the injured patient from point of injury through rehabilitation. Several efforts have been directed to surgical care and maintenance of surgeon readiness in the Military Health System (MHS). The focus on surgeons and surgical teams is twofold: (1) surgeons are at risk for battlefield surgery skill degradation and (2) the integrated trauma system, which is inclusive of prehospital providers, en route care, surgical teams, and critical care specialties, is at risk for not maintaining the collective/system lessons learned. It is crucial to have ready military medical and trauma capabilities in these perilous times marked by global threats and potential risks to national and homeland security.

The US military medical teams have proven to be capable, responsive, and adaptive. We also are one of the few global militaries that continue to maintain large military medical treatment facilities (MTFs) to care for active-duty patients, retirees, and beneficiaries. Recently, service members have rapidly established ancillary care sites, administered vaccines, and augmented civilian facilities during the COVID-19 pandemic. Publications have highlighted resource and care equipoise provided by US military trauma care for injured civilians and combatants[1] and the conflicts in Afghanistan and Iraq have the lowest US case fatality rates in history.[2] It is essential that this level of capability is maintained, especially during this conflict nadir. Strategies are being implemented to strengthen the military health care system and curtail the erosion of relevant surgical skills and knowledge during periods of low combat intensity, termed the 'peacetime effect,' which can contribute to higher case fatality rates at the start of the next war.[3] However, despite persistent challenges to this goal, we believe additional solutions are in reach.

EFFORTS

Public policies, laws, and strategic partnerships have led to incremental progress. The need for an integrated military and civilian national trauma care system was the imperative outlined in the 2016 National Academies of Sciences, Engineering, and Medicine report, which concluded that such a cooperative would improve patient outcomes and reduce preventable deaths, in addition to preserving the lessons of war and maintaining national readiness and homeland security.[4] This report was the basis for the MISSION ZERO Act, which funds the administrative costs of embedding military service members in civilian trauma centers. The 2017 National Defense Authorization Act

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(Public Law 116–92) specified provisions for structuring military and civilian partnerships (MCPs) to preserve readiness and improve health care quality, efficiency, and cost-effectiveness for DOD beneficiaries. This system integration could sustain wartime readiness through force generation and skill maintenance, combat casualty care infrastructure, and bidirectional resource and information sharing. Efforts have begun to implement these policies. Recently, the American College of Surgeons (ACS) and MHS formed the MHS Strategic Partnership ACS to improve surgical educational opportunities, system-based practices, and research capabilities. This partnership created the Military Clinical Readiness Curriculum, which offers free online training and resources for military and civilian surgeons worldwide.[5]

The creation of various MCPs is instrumental to maintaining surgical readiness.[6] Numerous MCPs allow entire military surgical teams to permanently embed within level 1 trauma centers. Individual military and civilian 'training agreements' permit surgeons to locally augment clinical practice. Training programs at high-volume military and civilian trauma centers facilitate deploying surgical teams to rotate through and 'ramp up' skillsets and improve cohesion through simulation, didactics, and clinical activity. These partnerships have been established through the DOD, surgical societies, and command support. Lessons learned from wartime can be sustained through MCPs during peacetime. While military hospitals continue to work toward increasing their volume and acuity, the wartime principles can be fostered, codified, and advanced in civilian trauma centers. As providers move between partnerships and military hospitals, these lessons learned can be adopted in both practices during interwar periods. This reciprocity leads to improved national preparedness but also to sustaining a military medical force that is ready to deploy because they have maintained trauma currency and competency.

The Uniformed Services University and JTS have taken an active role in assessing, training, and maintaining surgeon readiness through several avenues. The forefront Clinical Readiness Program (CRP) evaluates the knowledge, procedural skills, and clinical abilities deemed necessary for military surgeons. Components include routine knowledge curricula and exams, skills assessments through the Emergency War Surgery Course, peer review, training cycles, and quantification of deployment-relevant clinical practice.[7] The ACS Committee on Trauma Advanced Surgical Skills for Exposures in Trauma (ASSET) course was adapted to a military-specific program (ASSET+) and integrated into the Emergency War Surgery Course. This 2-day course evaluation showed improvement in independent surgical capability, with durable skills transferred to trauma or other procedures.[8] Similar educational avenues (eg, the Combat Orthopaedic Trauma Surgery course) exist for other surgical specialties and medical professionals. The CRP aims to ensure that deployed surgeons are adept at performing necessary procedures. This serves as a tool to measure readiness and inform local leadership of the clinical preparedness of their surgeons, which can enable informed action through local MTF policies, training, or clinical partnerships.

Knowledge preservation is critical for retaining the lessons learned from the recent wars. The US military did not enter the Middle East conflicts with an existing trauma system. The DOD Trauma Registry was established 2.5 years after the conflicts started and have supported evidence-based performance improvement and medical performance optimization. Medical performance optimization is the continuous monitoring and assessment of clinical care, trauma data, and combat casualty trauma systems to create best practices guidelines, inform educational and training, and influence doctrine, policy, manning, and equipping of trauma capabilities. The JTS Clinical Practice Guidelines, textbooks (eg, *Emergency War Surgery)*, and academic publications preserve decades of casualty care lessons.[5] DOD initiatives, military symposiums, and military-specific journals provide dedicated research platforms. Various military and civilian institutions facilitate military graduate education (GME).

CHALLENGES

Despite efforts to maintain preparedness, threats and challenges still persist. Many surgeons integral to combat medical care are leaving active duty. DOD budget cuts jeopardized 18,000 medical billets at military facilities before being temporarily suspended. Recent studies raise concern over low clinical volumes and case complexity at MTFs.[9] Fellowship opportunities are insufficient to meet trainee demands. These challenges impede the clinical practice of military providers and threaten to disrupt GME, recruitment, and retention.[10] Although civilian providers could augment a wartime surge, active-duty and reserve military physicians are familiar with military culture and protocols, deployment training, and health and fitness standards and understand demands of unique environments.

Future battlefields will unlikely be similar to the Middle East environment. The United States is not guaranteed aerial supremacy formerly attained in prior conflicts. Unmanned vehicles, nuclear weapons, chemical and biological agents, and large-scale assaults may challenge medical capabilities and capacities. Natural disasters and global pandemics continually threaten resources and manpower reserves. Preparing for these scenarios is crucial.

CALL TO ACTION

Current initiatives aggressively focus on preserving military medical and surgical readiness; however, further constructive actions are necessary to ensure best possible outcomes on the next battlefield.

Surgical educational supplementation is important, but adequate clinical volume and complexity is also necessary. Civilian partnerships will continue to play an instrumental role in achieving this goal; however, DHA efforts must be made to increase case volume and complexity at major MTFs. This will support the bulk of active-duty surgeons and strengthen military GME. An increasing proportion of cases are being referred to civilian ('purchased care') networks and fewer and less complex cases are being performed at MTFs ('direct care').[11] Allowing MTFs to care for Medicaid and Medicare patients could relieve civilian burden and increase MTF patient volume. Leadership must assess the capability and function of each MTF, not only within the MHS but also in the context of potential national and local civilian systems integration. Indeed, certain MTFs may not play a role in trauma care or supporting surgical practice. Smaller MTFs may need to be consolidated, and larger facilities augmented. The importance of governmental policies, GME, and supportive leadership cannot be overstated. Military commands should support surgeons through feasible individual avenues, such as local agreements, freedom for structured independent work, and promoting MTF clinical activity. The CRP should leverage leadership to make necessary adjustments to ensure that their surgeons remain deployable. One MTF reported that various local partnerships significantly augmented their surgeon caseload and complexity, with the majority meeting the MHS clinical readiness threshold.[6] Each MTF may have unique geographical opportunities or strategic partnerships to enhance surgical practice. A 'one size fits all' approach is unwise.

Surgeon retention is a challenge. Today's volunteer military physician force receives financial and tuition support during medical school, generous stipends during GME training, and are employed during their payback period. Unfortunately, the majority of surgeons leave active duty at the end of their service obligation, often citing frustration with clinical limitations and salary discrepancies with civilian counterparts. Recent retention bonus increases are

aimed at reducing salary discrepancies and military surgeon turnover, but challenges remain. Comprehensive solutions must involve an overall MHS strategy to improve MTF case volume but also to measure up to civilian surgical practice if the DOD wants to maintain a competent, and ideally excellent, surgical force. Internal army surgeon surveys have shown that location, case volume and complexity, financial compensation, and partnerships were all important factors in deciding whether to extend service obligation after completing their time owed in service.

Finally, government fiscal policies must continue to support the DOD MHS. Indeed, all medical providers and surgical team members are integral to combat casualty care success. Maintenance of skills, infrastructure, training, and knowledge repositories is critical for minimizing preventable deaths and sustaining military surgeons. In this era of global uncertainty, it is imperative that the US military medical system and surgeons remain supported and prepared for an array of conflicts and crises.

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