

# Lessons Learned by the 75th Ranger Regiment during Twenty Years of Tactical Combat Casualty Care

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Since the late 1990s, the 75th Ranger Regiment has been a leader and strong advocate for advancing tactical combat casualty care (TCCC). As an early adopter, the Ranger Regiment tailored TCCC to best support the Ranger mission as well as the regimental commander's intent. Emphasized throughout the organization was command ownership of the casualty response system, a ubiquitous mastery of the basics of TCCC by medical and nonmedical first responders, and a medical provider proficiency in the most current emergency medicine and trauma care practices.<sup>1</sup> Combat casualty care was a team effort. The goal was to reduce battlefield morbidity and mortality, and especially to eliminate prehospital preventable death.

Among U.S. military fatalities incurred during the initial ten years of conflict in Afghanistan and Iraq, approximately 24 percent had injuries that were determined to be potentially survivable.<sup>2</sup> Injury survivability determinations are based on ideal circumstances, instantaneous knowledge of all injuries, and immediate

availability of unlimited Level I trauma capabilities. Trends in injury survivability can help clinicians and researchers identify opportunities for improvements in diagnostics and therapeutics, both for the prehospital and hospital environments.

Among fatalities incurred by the Ranger Regiment over twenty years of combat operations, the regiment maintained zero prehospital preventable deaths.<sup>3</sup> Death preventability determinations are based on real-world and actual circumstances, the tactical impacts of the environment and enemy, and other notable factors that impose substantial limitations on optimal and timely care. Trends in death preventability can help medical and nonmedical personnel identify opportunities for improvement in tactics, techniques, and procedures (TTPs); personal protective equipment; and evacuation and care of casualties.

The mission of the 75th Ranger Regiment is to execute joint special operations missions in support of U.S. policy and objectives. The regiment is also considered



A U.S. Army Ranger combat medic from 2nd Battalion, 75th Ranger Regiment, takes part in routine medical training in August 2019. The 75th Ranger Regiment has been a leader in and strong advocate for advancing tactical combat casualty care across the Army. (Photo by Jaerett Engeseth, U.S. Army)

to be the Army's premier raid force.<sup>4</sup> Capabilities of the regiment include airborne, air assault, and other direct-action raids used to seize key terrain, destroy strategic facilities, and capture or kill enemy forces. Rangers are trained to conduct assaults, ambushes, and other missions at all levels, from squad- to regimental-size operations.

The table of organization and equipment for the 75th Ranger Regiment is similar to that of a standard light infantry brigade, and the battalions within the Ranger Regiment are comparable to light infantry battalions. As such, lessons learned and best practices from the Ranger Regiment can be readily applied to similar organizations across the U.S. Army and U.S. Marine Corps. Additionally, beyond these organizations, the philosophy and principles of the regiment are pertinent to all U.S. Department of Defense (DOD) units preparing for and conducting combat operations.

The 75th Ranger Regiment is comprised of a regimental headquarters, a special troops battalion, a military intelligence battalion, and three rifle battalions. The Ranger Regiment currently has a total of six physicians, five physician assistants, and 122 medics to support nearly four thousand assigned personnel. The regimental headquarters, the special troops battalion, and each rifle battalion have a physician, physician assistant, and medics. The military intelligence battalion has one physician and one senior medic. The regimental headquarters has four medics and is staffed primarily to advise and support battalion operations and training. The special troops battalion has twenty-seven medics, and each rifle battalion has thirty medics. Medical personnel within the regimental headquarters provide support to personnel within the headquarters and also supplement the battalions as dictated by the mission. Medical personnel within the special troops

battalion support personnel within the battalion and the battalion mission. Each rifle battalion has fourteen headquarters company medics. Six of these medics are maintained centrally, and eight ambulance team and treatment squad medics are aligned functionally as two additional medics for each of the four rifle companies. Each of the four rifle companies has four assigned medics, a company senior medic and one medic for each of three platoons. Medical personnel within the battalion headquarters company provide support to personnel within the headquarters and also supplement battalion and line company operational requirements as dictated by the mission. All medics assigned to the 75th Ranger Regiment are trained to the level of Advanced Tactical Practitioners, a tactical paramedic, as military occupational specialty 68W, W1 Special Operations Combat Medics. These ranger medics are the continuity and core of the casualty response system; they are the organizational standard bearers for TCCC.

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Ranger lessons learned and best practices for casualty care apply not only to other military units conducting combat operations but also to military units conducting operations other than combat. Additionally, these principles can apply in the civilian sector for untoward events that generate casualties such as vehicle collisions, falls, shootings, bombings, and natural disasters.

The rangers' focus on mastery of the basics—which includes the five priorities of marksmanship, physical training, medical training, small-unit tactics, and mobility—has created a lethal yet lifesaving force that has been successful in completing the operational mission while simultaneously mitigating preventable death among ranger casualties. A continuous cycle of performance improvement efforts, including capturing and

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analyzing data and routinely reporting casualty statistics and trends, is paramount for advancing novel diagnostics and therapeutics and evaluating and refining TTPs, personal protective equipment, and systems of casualty response and care. These performance improvement efforts identify gaps and drive quantifiable change that saves lives. Objective data and subsequent evidence-based recommendations can be used to efficiently procure resources; refine personnel, training, and equipment initiatives; and guide force modernization and research efforts. Collecting and analyzing data for performance improvement is cost-effective, as it informs decisions and justifies expenditures of time and monies.

A death rate or mortality rate is a measure of the number of deaths in a specific population that is scaled to the size of the

population per unit of time. A case fatality rate (CFR) is the fraction of an exposed group, or a proportion of a population, diagnosed with a certain illness or injury who end up dying from that illness or injury. For combat casualty care of military forces, the CFR is a summary statistic that provides a measure of the overall lethality of the battlefield among military personnel who sustain a battle injury.<sup>5</sup> The CFR can assist in assessing the quality of a unit's casualty response system and provide context to trends in injury survivability and death preventability. Killed in action (KIA) fatalities are defined as battle-injured casualties who die in the Role 1 prehospital environment. Died of wounds (DOW) fatalities are battle-injured casualties who die after arriving at a facility with surgical capability (e.g., Role 2 forward surgical facility, Role 3 combat support hospital, Role 4 overseas or continental hospital). The CFR can be calculated by taking the total number of KIA and DOW, and dividing this number by the total number of casualties with battle injuries that includes KIA and wounded in action (WIA), both survivors and DOW, and then multiplying this quotient by 100:

$$\text{CFR} = (\text{KIA} + \text{DOW} / \text{KIA} + \text{WIA} [\text{Survivors} + \text{DOW}]) \times 100$$

From 2001 to 2021, the U.S. military achieved a cumulative CFR of 9.5, or 9.5 deaths for every one hundred battle-injured casualties, for combat operations in Afghanistan and Iraq.<sup>6</sup> During the same time, the Ranger Regiment had a lower cumulative CFR of 7.6.<sup>7</sup> The difference between these two numbers is not statistically significant; however, this difference does equate to fifteen lives. In other words, in addition to the ranger lives saved by the advancement of communal efforts by the U.S. military and the Ranger Regiment as a whole, as many as



A medic from the 75th Ranger Regiment participates in combat trauma management training 15 April 2015 at Fort Benning, Georgia. Mastery of the basics, blood product resuscitation, a command owned casualty response system, and tactical medical planning contributed to lives saved in the Ranger Regiment from 2001 to 2021. (Photo by Pfc. Eric Overfelt, 75th Ranger Regiment)

fifteen additional rangers may be alive today due to unique aspects of the casualty response system as established, maintained, and advanced by the Ranger Regiment.

## Discussion

Multiple factors may have contributed to the lower CFR achieved by the Ranger Regiment. The regiment

has a history of advancing prehospital medicine on the battlefield, serving as early adopters of cutting-edge emergency and trauma medicine, and working to translate efforts across the DOD and civilian trauma systems.<sup>8</sup> Additionally, combatant commanders and other nonmedical leaders within the regiment have and continue to recognize the importance of prioritizing combat casualty care.<sup>9</sup> Initial and sustainment medical training, with competency assessments during each nine-month operational readiness training cycle, develops and maintains knowledge, skills, and abilities of individual medical and nonmedical first responders throughout the organization. In addition to individual training, unit collective training and the integration of casualty care and evacuation within each battle drill fosters a cohesive team and a mastery of the basics through rehearsals, repetition, and conditioning.

Several TTPs and standard operating procedures can be captured from the Ranger Regiment that have likely contributed to the unit's maintenance of zero prehospital preventable deaths during combat operations. The authors surmise four key principles as critical in advancing the regiment's combat casualty care system and are paramount to the unit's success. These principles are not specific to the counterterrorism fight and will be imperative and applicable to providing casualty care in various environments, intensities, and scale of combat in the future. The Ranger Regiment has and must continue to emphasize (1) a mastery of the basics equating to TCCC training for all that includes an emphasis on immediate hemorrhage control, (2) far-forward blood-product resuscitation, (3) a command-owned and directed casualty response system, and (4) tactical medical planning.

## **Mastery of the Basics—TCCC for All**

Integrating best practices from the contemporary medical literature and lessons learned from prior wars and conflicts, the U.S. military made substantial progress achieving the most current cumulative CFR of 9.5 for the Afghanistan and Iraq conflicts.<sup>10</sup> In comparison, this rate is significantly lower than the previously reported 19.1 CFR for World War II and 15.8 CFR for the Vietnam War.<sup>11</sup> The Ranger Regiment achieved an even lower CFR of 7.6 for the conflicts in Afghanistan and Iraq.<sup>12</sup> A mastery of the basics in TCCC by all rangers, not just medics, was a notable contributor to this low

CFR. The regimental commander has directed and continues to direct that all rangers maintain medical training and proficiency as one of the five basic priorities of effort. The regimental commander mandates TCCC training for all each training cycle that is deliberate, planned, and integrated, and then verifies this dedicated training time during the quarterly training brief with each company commander. Adherence and progress are checked during command and staff briefings as battalion commanders must report the percentage of rangers trained on TCCC as part of the unit's true combat medical readiness statistics. This medical training is based on the Joint Trauma System and Defense Health Agency TCCC for All Service Members course and includes an emphasis on best practices and evidence-based guidelines for prehospital trauma care on the battlefield such as immediate hemorrhage control using tourniquets, pressure dressings, and hemostatic dressings, as well as other TCCC self and buddy care.<sup>13</sup> This was initiated in 1997 and codified in the Ranger First Responder program and the Ranger Casualty Response System. The Advanced Ranger First Responder program was established in 2016 and since has trained nonmedics in advanced medical skills beyond the scope of Combat Lifesaver training to augment battlefield medical providers and care.

TCCC training for all, including nonmedics, medics, and medical providers, is made as realistic as possible through combat simulation and holds every ranger and leader accountable for TCCC and medical skills proficiency. In the Ranger Regiment, casualty response and care principles and practices are drilled and trained through the entire system from the point of injury through casualty evacuation and surgical care. This training is an integral component of battle drills, with simulated casualties in realistic scenarios while conducting platoon live-fire exercises or similar maneuver events, and includes self-care, buddy care, and treatment by medics and other medical providers. Instead of concentrating on casualties after training, this training emphasizes responding to casualties during any phase of the operation. This mastery of the basics, and use of realistic training and rehearsals, are required to advance and provide more sophisticated casualty care at the point of injury by ranger medics and Advanced Ranger First Responders. Senior noncommissioned officers and officers evaluate junior noncommissioned



A Ranger infantryman from 1st Battalion, 75th Ranger Regiment, who is a qualified Advanced Ranger First Responder, practices providing a blood transfusion from a universal donor to a ranger in need of blood. Rangers carry some whole blood in the field, but when it runs out, predetermined universal donors provide their own blood to keep their fellow rangers alive. Implementing the Ranger O Low Titer (ROLO Whole Blood) Program, Ranger units maintain a list of universal blood donors and train first responders to administer blood transfusions to treat battlefield casualties. ROLO is now a program of record in the U.S. Army, and can be implemented at any unit. (Photo courtesy of the 75th Ranger Regiment)

officers and their unit's casualty response system, emphasizing command ownership and a team approach toward casualty scenarios.

Through a mastery of the basics, realistic training, and rehearsals, medical and nonmedical first responders and leaders have not had to hope for the best and rise to the occasion. Rather, all have been trained for what is expected and to also expect the unexpected. They anticipate casualties and injuries, especially hemorrhagic injuries, during every phase of the mission. They are also conditioned to provide hemorrhage control and other time-sensitive emergency and trauma care that saves lives. For traumatic events resulting in severe and critical injuries, decreasing time to a required medical capability is essential for reducing morbidity and mortality. Providing timely hemorrhage control and other trauma care basics is a must on the battlefield.

## Blood Product Resuscitation

Hemorrhage has been, and likely will continue to be, the most prevalent mechanism of death among fatalities with a potentially survivable injury on the battlefield.<sup>14</sup> Key to survival is rapidly controlling the hemorrhage and replacing the blood that was lost. The medical and trauma literature continues to validate further the necessity and mortality benefit of early blood product resuscitation while also demonstrating the harm of providing crystalloid (clear fluid, such as saline) resuscitation in trauma patients.<sup>15</sup> Ranger medics have been carrying blood products on combat missions, including freeze-dried plasma since 2011 and cold-stored whole blood since 2014.<sup>16</sup> In addition to freeze-dried plasma and cold-stored whole blood, these lifesaving blood products also include packed red blood cells and liquid plasma. The Ranger Regiment



Rangers assigned to Delta Company, 3rd Battalion, 75th Ranger Regiment, overwatch and provide cover for an assault on a night raid during a training exercise at Fort Irwin, California, 24 February 2015. The Rangers specialize in raids and assault missions deep inside enemy territory. (Photo by Pfc. William Lockwood, U.S. Army)

has trained, validated, and rehearsed blood product resuscitation indications and implementation procedures throughout the casualty response system to include the regiment's buddy transfusion Ranger O Low Titer (ROLO Whole Blood) Program. The ability of ranger medics to carry and initiate whole blood and other blood product resuscitation at or near the point of injury for the combat wounded within minutes of injury has had an impact on the regiment's combat casualty care and mortality. Early whole blood and blood product resuscitation are of critical importance in eliminating preventable combat death and reducing fatality rates.

## **Command-Owned and Directed Casualty Response System**

As described by Gen. Stanley McChrystal, Command Sgt. Maj. Mike Hall, and others in a 2017 article, eliminating preventable combat deaths is an organizational issue that requires leadership

from both medical and nonmedical leaders.<sup>17</sup> Responsibility, accountability, and ownership are fundamental leadership traits essential for the success and advancement of organizations and the multitude of efforts within those organizations. Leaders direct priorities, set standards, and then monitor and enforce those standards. Effective leaders translate their vision to subordinates and create a shared understanding of buy-in and ownership at all levels, which then drives innovation and improvement.

Command direction and oversight, including allocation of time, money, and personnel, exemplify where the priority of effort and accountability are placed. Combat casualty care must include dedicated and planned training that is formally scheduled. Organizations must allocate resources, including time, to support realistic medical training rather than just relying on informal periods of instruction such as hip pocket training that is conducted impromptu if extra time becomes available. Currently, the 75th Ranger

Regiment's command-directed and planned training during each operational readiness training cycle includes three days of Ranger First Responder (TCCC for all personnel), two weeks of Advanced Ranger First Responder (for at least one infantryman per squad), and two weeks of Ranger Medic Assessment and Validation for all ranger medics.<sup>18</sup> This medical training focuses on repetitive hands-on learning to master the basics before applying these basics to realistic simulated casualties using moulage on fellow rangers, instead of mannequins, as training models. Commanders also prioritize combat casualty care by actively budgeting for medical training and modernization. Ranger medical leaders are then able to plan and resource realistic training, supported by tasked, nonmedical rangers allocated by the commander through this prioritization of medical training. Additionally, the ranger medical leaders can modernize expendable items at the pace of medicine through this allocation of funds.

The Ranger Regiment must always be operationally ready at a moment's notice. Thus, medical training proficiency and mastery must be continually emphasized and maintained to support this ever-present requirement. The organization has developed and instituted standards for nonmedical personnel, medical personnel, and leader medical training. The regimental medical leadership has maintained a performance improvement process to continually gather lessons learned, refine education and training, and standardize and advance care. Ultimately, medical proficiency and a mastery of the basics by all equates to every ranger understanding, training, and rehearsing their individual and collective role in the casualty treatment and evacuation process. This results in a Regimental Casualty Response System with each ranger and each ranger team working at the maximum potential for their training level and expertise.

## Tactical Medical Planning

It should be expected that casualties will occur during combat operations. A plan should be in place before each mission. Every aspect of the casualty treatment and evacuation process must function smoothly to eliminate preventable combat death and decrease the CFR. This requires an individualized, well-rehearsed, and well-understood tactical medical plan. In addition to understanding the mission and the

commander's intent, the tactical medical planner must understand the forces and resources arrayed on the battlefield.<sup>19</sup> Medical planning and contingency planning in support of ranger missions are bottom-up processes. Platoon and company medics understand the tactical mission and medical plan, and the mortality impacts of time and any delay to receiving blood products and surgery when needed.<sup>20</sup> This bottom-up planning process, with the proper leader involvement and understanding, ensures that resources are available, unnecessary evacuation delays are avoided, and the medical plan is practical and understood by all involved, from the lowest person conducting the mission to the highest level leader on the mission command team. The distribution and synchronization of timely and appropriate combat casualty care is dependent on deliberate and thoughtful tactical medical planning. Ultimately, this tactical medical planning may equate to increased survival in casualties with severe and critical injuries.

A tactical medical plan is created by individualized mission medical planning that factors in the nuances and variables of each mission and does not apply a cookie-cutter medical common operating picture to the mission. The medical plan is tailored to the mission. The medical plan includes contingency planning for the evacuation and care of any casualties incurred during each phase of the mission (e.g., infiltration, actions on the objective, and exfiltration). Ranger leaders plan the location of all medical assets during each phase of the operation, including the location of blood products, and incorporate air, ground, and water transport platforms into the evacuation plan for both nonstandard casualty evacuation and standard medical evacuation. Within the restrictions of the tactical mission, time to blood and time to surgery is prioritized and reduced, rather than applying the tactical mission to the strategic medical common operating picture. Through proper tactical medical planning, rehearsals, and training, the entire system comes together to streamline the treatment and evacuation of casualties. This ultimately helps to decrease the CFR and eliminate preventable death on the battlefield.

## Conclusion

Throughout twenty years of combat operations in Afghanistan and Iraq, the U.S. military and the 75th Ranger Regiment achieved low cumulative case



fatality rates. Additionally, the regiment maintained zero prehospital preventable deaths. More rangers are alive today because of a command-owned and directed casualty response system that trained all rangers and encouraged innovative medical practices and procedures. The regiment's lessons learned and subsequent requirements are applicable across the DOD. They also apply beyond recent conflicts to future conflicts.

The principles of TCCC mastery and training for all, far-forward blood product resuscitation, command ownership of the casualty response system, and tactical medical planning are applicable to all combat environments, including large-scale combat operations. While large-scale combat operations may require caring for casualties in the prehospital environment for an

extended period of time compared to the shorter times experienced during combat operations in Afghanistan and Iraq, the basis of prolonged casualty care is built upon and reliant upon the tenants of TCCC.<sup>21</sup> Additionally, leaders in all units can apply these basic elements to their respective populations to similarly reduce combat mortality.

The U.S. military must continue to improve and emphasize mission-critical tasks. Minimizing preventable combat deaths is one of these mission-critical tasks. No father, mother, brother, sister, family member, or friend should have to lose their loved one to a preventable combat death. Additionally, no leader or teammate should have to bear the burden of losing one of their comrades-in-arms to a preventable combat death. ■

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## Notes

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