

An Ongoing Series

Editorial on the Approach to Prolonged Field Care for the Special Forces Medical Sergeant *Balancing the Opportunity Cost*

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INTRODUCTION

America's adversaries will contest US military superiority in the domains of land, sea, air, space, and cyberspace. Fundamentally, these foes seek to disrupt the dominance of American fighting forces through anti-access and area denial (A2AD) systems, such as cyber exploitation, electromagnetic jamming, air defense networks, and hypersonic capabilities. According to Training and Doctrine Command (TRADOC) Pamphlet 525-3-1, these A2AD capabilities create multiple layers of stand-off that inhibit the US ability to focus combat power and achieve strategic objectives in a contested, increasingly lethal, inherently complex, and challenging operational environment.¹ The Department of Defense (DoD) plans to mitigate this shift in enemy strategy through the adoption of multidomain operations (MDO).¹ MDO is defined as operations that converge capabilities to overcome an adversary's strengths across various domains by imposing simultaneous dilemmas that achieve operational and tactical objectives.¹ Within this MDO construct, medical treatment expectations must shift accordingly as the ability to rapidly treat and evacuate patients may be constrained by enemy action. Thus, the notion of prolonged field care (PFC) may be a necessity on the future battlefield.

As Special Operations Forces (SOF) continue to refine what PFC entails, it is imperative that an understanding of the incidence and type of diseases that require medical evacuation to higher levels of care be thoughtfully estimated. Armed with an understanding of the anticipated epidemiology, effective prioritization of training requirements and equipment acquisition is possible in a manner that is complementary to the overall success of the assigned mission. Furthermore, this prior planning mitigates risk, as the limitations of money and time impose significant opportunity costs in the short run should the disproportionate mix of disease states be pursued, which in turn, avoids jeopardizing Soldiers' lives over the long term.

KEYWORDS: *prolonged field care; Special Forces medical sergeant; evacuation; medical care*

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Background

The definition of PFC remains absent in official doctrine. Keenan and Riesberg endorsed a description of PFC as being field medical care applied beyond doctrinal planning timelines and utilizing limited resources.² Due to the anticipated effects that might be imposed by enemy A2AD systems during a future MDO, American forces may encounter PFC scenarios at a greatly increased probability. This is in stark contrast to the previous "Golden Hour" standard enjoyed for nearly two decades during the Global War on Terror. However, this is by no means revolutionary, as these conditions surrounding medical care were the norm for the majority of American combat operations in history. Thus, PFC is a return to the fundamentals of military medicine that build on the hard-earned lessons of past conflicts.

Arguably, the greatest advancement in military medicine of the past 40 years is predicated on the epidemiological understanding of potentially-survivable battlefield injuries pioneered by Ronald Bellamy.³ Subsequent research delineated these causes into controllable hemorrhage, tension pneumothorax, and loss of airway.³⁻⁵ Thanks to this understanding, and the appreciation for the relative incidence of each, it becomes clear how to optimally prioritize training and equipment requirements. This is the essence of opportunity cost; to accomplish one action, we must likely compromise on some other action(s). These daily calculations balance risk based on the knowledge at hand, particularly when capacity is limited to leveraging resources against only one option. Acknowledging that no Special Forces medical sergeant (SFMS) can sufficiently train on every task within the Soldier Training Publication (STP) 31-18D34-SM-TG to a uniform level of proficiency, how should resources be allocated to best prepare for MDO against a dedicated future adversary where PFC is an increasing probability? This editorial seeks to rationalize the prioritization of the 380 tasks within the STP to minimize opportunity cost and maximize success by understanding the

underlying epidemiology of disease burden requiring evacuation from the anticipated battlefield of tomorrow.⁶

Methods

This study is predicated on the critical hypothesis that any patient who requires a higher level of care, and is unable to access that care due to operational constraints, becomes a PFC patient from the perspective of medical personnel within a Special Operations task force (SOTF). In an attempt to find a representative patient population where information was available regarding all illness and injury incurred while deployed, the research of Murray et al. noting epidemiologic trends within a Role II medical facility in Iraq from 2003 to 2004 appeared the most applicable.⁷ Specifically, this research reflected intense ground combat operations, concurrent stability operations, the effects of a diverse patient pool (i.e., female Soldiers), and an austere environment with little supporting host nation medical infrastructure.

Murray et al. reported 341 total evacuations, 35 inpatients, and 84 dental patients (i.e., root canal patients) who would have likely required additional care that would exceed the organic capabilities of a SOTF. In examining this literature further, it is shown that 150 patients were wounded in action (WIA) from the 341 total evacuations. Of the remaining evacuations, 191 were due to orthopedic injuries. Notably, this study excluded behavioral health cases, as these were exclusively seen by a neighboring combat stress control team. However, reports from World War II cite approximately 20% of all “battle casualties” were the result of neuropsychiatric causes.⁸ The authors posit that the World War II “battle casualty” statistic correlates most closely to today’s WIA definition. Therefore, if we assume that a future MDO battlefield will be inherently stressful, then applying a 20% metric to compensate for this missed pathology would reflect 38 patients (as calculated by $(150/0.8) - 150$) requiring evacuation for a behavioral health concern. In total, this represents 499 serious medical cases that would have been PFC patients had the necessary ancillary services or evacuation not been available. The complete breakdown of patients by type allows for an overall percentage calculation that can then be applied to different populations in a hypothetical future scenario. This information is shown in Table 1. Graphically, this would appear as the distribution shown in Figure 1.

Although these percentages are useful, they remain difficult to apply unless an underlying casualty rate is known. According to Belmont et al., 6,990 WIAs were observed for each 100,000 troop years for an Army Brigade combat team during the Operation Iraqi Freedom “surge.”⁹ Per Murray et al., 40% of all WIAs seen at the Role II were evacuated. Therefore, 40% of 6,990 total WIAs is 2,796 patients. If this number, in turn, reflects 30.06% of the total PFC casualty estimation, then for a population of 100,000 soldiers deployed for 1 year, we would expect to see 9,302 total PFC cases within this hypothetical population. Adjusting accordingly for unit size using 500 personnel SOTF and 120 personnel Special Forces Operational Detachment-Bravo (SFOD-B) approximations, the following allocation of PFC cases would arise (see Table 2).

Given these extrapolations, it is clear that PFC is not simply the extension of Tactical Combat Casualty Care (TCCC) standards for a protracted duration. On the contrary, because SOF will be required to manage the entirety of the health concerns

TABLE 1 Casualties Requiring Prolonged Field Care by Percentage

Casualty Type (Number)	Description	Percentage
Disease Non-Battle Injury (DNBI) (226/499)	Personnel whose injuries were not caused by direct enemy action	45.29
Disease (35/499)	Individuals with a medical illness that excludes the musculoskeletal system	(7.01)
Orthopedic Injury (191/499)	Individuals with a musculoskeletal injury	(38.28)
Dental Patients (85/499)	Patients requiring significant dental work that precludes effective service (e.g., root canal)	17.03
Wounded in Action (WIA) (150/499)	Injuries caused by direct enemy action and the individual survives	30.06
Psychiatric Patients (38/499)	Personnel with a behavioral health condition requiring treatment that is not supportable in theater	7.62

FIGURE 1 PFC casualty estimation.

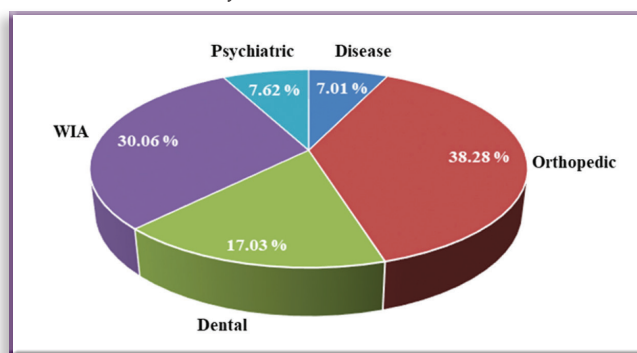


TABLE 2 Estimated Prolonged Field Care Casualties by Type

Casualty Type	Per 100,000 per Year	Per SOTF per Year	Per AOB per Year
WIA (30.06%)	2,796	14	4
Disease (7.01%)	652	4	1
Orthopedic (38.28%)	3,561	18	5
Dental (17.03%)	1,584	8	2
Psychiatric (7.62%)	709	4	1
Total (100%)	9,302	48	13

presented during an anticipated MDO, a balanced approach that encompasses the expected disease burden involved in PFC must be pursued.

Discussion

Foremost, do the aforementioned estimations make sense? From the collective authors’ experience, we believe they do. Additionally, the diversity in the types of cases included in these estimations speaks to the benefit of the broad and intensive training SFMSs receive. By approximating which categories of disease are likely to occur, and in what quantities, this knowledge will assist in making crucial decisions regarding training and preparation. Acknowledging the 380 skill tasks represented in the STP, revised to 313 tasks in the SFMS critical task list in July 2008, it becomes apparent that some may be far more useful to prioritize in a PFC training program. However, although PFC is a pressing issue, it cannot eclipse all of the necessary training required for SFMS proficiency.

Fundamentally, training must focus on how the organization is expected to fight. For any Special Operations unit, the mix of mission requirements is derived from the unique aspects of the operational environment where they will likely find themselves engaged. While this will vary between organizations, there are likely to be similarities that will far outweigh the differences, particularly if we are anticipating a future MDO against a capable adversary.

US Army Special Forces have nine principal tasks: foreign internal defense, counterinsurgency, security force assistance, counterterrorism, special reconnaissance, counterproliferation of weapons of mass destruction, direct action, preparation of the environment, and unconventional warfare (UW).¹⁰ It is the authors' opinion that an UW mission, defined as operations that enable a resistance movement to coerce, disrupt, or overthrow a government by operating through or with a guerrilla force in a denied environment, poses the greatest probability of a PFC scenario during a MDO.¹¹ This would be particularly true if the SFMS was charged not only with the care of fellow American Soldiers but also with providing healthcare to the fighters, leaders, and families of partner force personnel engaged in the UW operation. With recent history as a guide, how can we best prepare SFMSs for UW in an environment similar to DeBaltseve in 2015 or Aleppo in 2016?

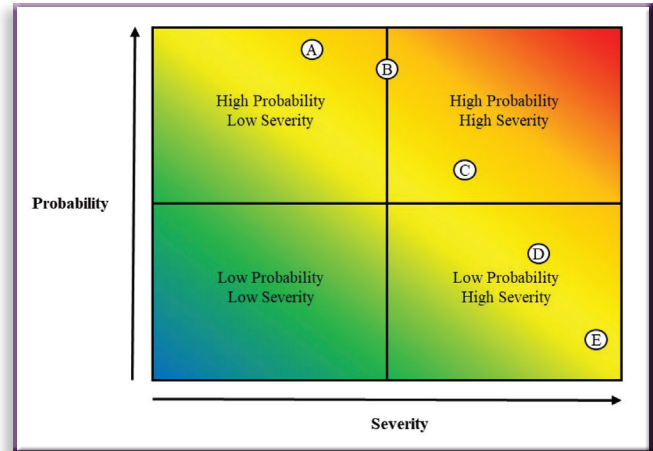
First, what MOS-specific capabilities must a SFMS apply in order to keep themselves, and their teams, alive? Broadly speaking, we assess this as involving five major areas organized by probability of occurrence against the perceived severity to force and mission. Specifically, these areas are operational medical planning (A), providing sick-call, preventive, and travel medicine services (B), performing TCCC (C), conducting PFC (D), and treating chemical, biological, radiological, and nuclear (CBRN) casualties (E) as conceptualized in Figure 2.

By limiting the training to that which is considered necessary to provide these capabilities, individual skills from the STP can be selectively identified that compose the standard criteria that all SFMS will be evaluated on in a trained/practiced/untrained framework for appropriate emphasis. Based on the risk assessment completed above, it is also possible to make sound judgments about how to further prioritize within these high-yield skills as time, funding, and other obligations significantly restrict training opportunity. Again, accepting the reality of opportunity costs, we need to emphasize that training in PFC should complement the overall SFMS skill requirement, be balanced in its likelihood of occurrence, and reflect the full spectrum of pathology that will impose healthcare needs for our personnel.

Summary and Conclusions

It must be acknowledged that PFC situations on the future battlefield should never be the desired outcome. A PFC scenario implies that the medic, the patient, and a portion of their supporting team are effectively immobile, combat ineffective, and no longer seizing the initiative against their foe. Therefore, although PFC may represent the pinnacle of tactical medical challenge, and a suitable scenario against which training proficiency can be measured, we must still make every effort to avoid such a situation despite the fact that the SFMS may be fully competent to manage it. The strategic equation remains unchanged despite the shifts in technology surrounding land

FIGURE 2 SFMS capabilities organized by risk.



combat; victory is obtained by exerting your will upon your opponent and nothing less. Although we can, and should, continue to press for ever expanding and increasing skills that reduce casualty mortality on the battlefield, this must be balanced against the opportunity cost of maintaining lethal skills within the SFMS and their teammates, whose bravery will ultimately dictate the outcome of future conflicts.

Disclaimer

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Disclosure

The authors have nothing to disclose.

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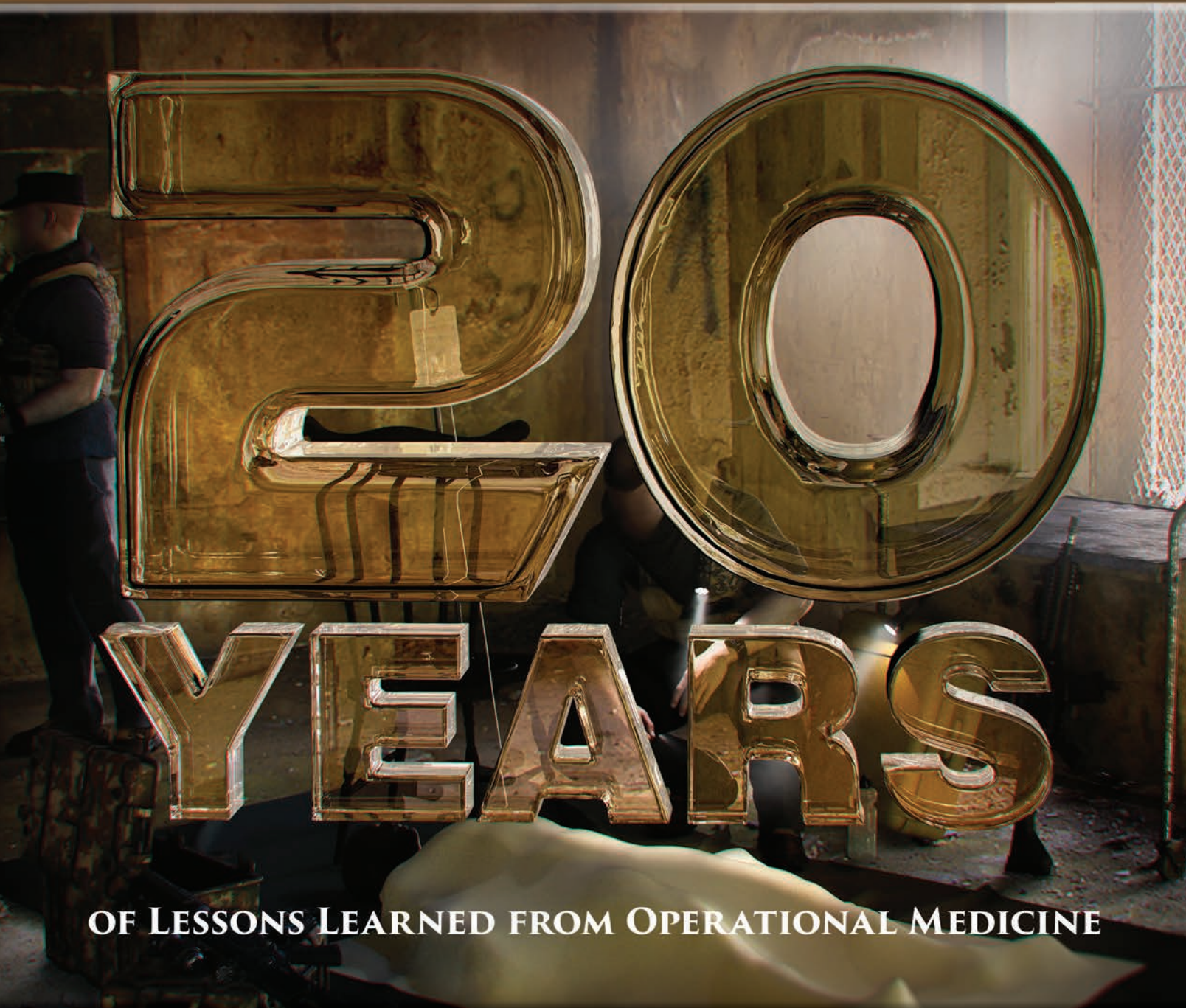
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