Larger Wars and a Smaller Army Health System: How Should the Army Health System Evolve to Support Large-Scale Combat Operations?

A Monograph

by

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This study is a critical examination of Army Health System support to II Corps in the Tunisia Campaign in North Africa from 1942-1943. The Army Health System provided health service support to the ninety thousand soldiers of II Corps in the inaugural campaign in the Mediterranean. This paper seeks to answer the question of how the Army Health System should evolve to support large-scale combat operations of today and the future. It presents the Army Health System of II Corps in the Tunisia Campaign and the contemporary Army Health System and large-scale combat operations, each as a case study. The study concludes that the Army Health System of World War II successfully generated the hospitalization and evacuation structure to support the Allied win in Tunisia. In contrast, the Army Health System of today is not adequate to support mission success in the rigors of large-scale combat operations.

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Abstract

Larger Wars and a Smaller Army Health System: How Should the Army Health System Evolve to Support Large-Scale Combat Operations? by MAJ Bethany G. Landeck, 37 pages.

This study is a critical examination of Army Health System support to II Corps in the Tunisia Campaign in North Africa from 1942-1943. The Army Health System provided health service support to the 90,000 soldiers of II Corps in the inaugural campaign in the Mediterranean. This paper seeks to answer the question of how the Army Health System should evolve to support large-scale combat operations of today and the future. It presents the Army Health System of II Corps in the Tunisia Campaign and the contemporary Army Health System and large-scale combat operations, each as a case study. The study concludes that the Army Health System of World War II successfully generated the hospitalization and evacuation structure to support the Allied win in Tunisia. In contrast, the Army Health System of today is not adequate to support mission success in the rigors of large-scale combat operations.

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Abbreviations

AHS	Army Health System
CASEVAC	Casualty Evacuation
FHP	Force Health Protection
FRST	Forward Resuscitative Surgical Team
HHD	Headquarters and Headquarters Detachment
HHS	Health Service Support
ICW	Intermediate Care Ward
LSCO	Large-Scale Combat Operations
MEDEVAC	Medical Evacuation
MTF	Military Treatment Facility
WWII	World War II

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Introduction

The *National Security Strategy* states that the Department of Defense must develop new operational concepts and capabilities to retain overmatch of combat power and win without guaranteed dominance.[1] The increased lethality of large-scale combat operations (LSCO) results in an increased probability of casualties and places an incredible burden on medical resources due to the magnitude of the forces involved. Hospital and evacuation capabilities require the capability to support thousands of casualties daily. Such a campaign could generate significant casualties and potentially overwhelm the current Army Health System (AHS) with catastrophic results. After eighteen years of limited contingency and counterinsurgency operations, the AHS may no longer be capable of supporting LSCO. This monograph seeks to answer the question of how the AHS can support LSCO. To answer this, the monograph examines II Corps in the Tunisia Campaign of World War II (WWII), introduces the theater organization and medical structure in historical context, defines LSCO, examines the AHS capabilities of today, and analyzes parallels between the two.

The Tunisia Campaign provides a particularly good case study to examine. In the Tunisia Campaign, neither the Allied or Axis forces had assured dominance. This resulted in five thousand American soldiers killed in the ten-day Battle of Kasserine Pass alone. During the first three days of Kasserine Pass, soldiers were lost at the rate of 1,333 per day due to the inherent lethality of LSCO.[2] Large wars create large numbers of casualties, which require a large capability by the AHS to provide hospitalization and evacuation to sustain combat power. These are the very challenges that AHS will face in a future LSCO.

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[1] Donald J. Trump, *National Security Strategy of the United States of America* (Washington, DC: Government Printing Office, 2017), 28-29.

[2] US Department of the Army, Field Manual (FM) 3-0, *Operations* (Washington, DC: Government Printing Office, 2017), 1-2.

II Corps in the Tunisia Campaign

In November 1942, the Allies initiated Operation Torch, the inaugural battle of the Tunisia Campaign of World War II. The goal of the campaign was to seize French North Africa as a stepping-stone to further Allied operations. The Western, Center, and Eastern Task Forces rendezvoused off North Africa and conducted simultaneous amphibious landings on the morning of 8 November 1942, D-Day.[3] The Tunisia campaign ended when Axis forces surrendered on 13 May 1943.[4] The objective of the campaign's first phase was to land and seize nine objectives along a nearly one-thousand-mile coastal front from French Morocco's capital of Casablanca to Oran and Algiers in Algeria. Once the Allies secured the port cities of Algiers, Oran, and Casablanca, they planned to move 500 miles to the east into Tunisia and capture Bizerte and Tunis, and open sea lines of communications in the Mediterranean. The Center Task Force, II Corps, the focus of this case study, sailed from Scotland, landed at Oran, and continued to Bizerte, Tunisia.[5] The strength of II Corps for Operation Torch totaled 40,700 personnel.[6] II Corps increased its strength to four divisions plus corps support units, totaling 90,000 troops in the spring of 1943.[7]

Mission and Organization of the II Corps Army Health System

The mission of the AHS for II Corps was to provide health service support to the corps in the Tunisia Campaign. US Army doctrine in World War II organized medical services in five

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[3] Carlo D'Este, *World War II in the Mediterranean: 1942-1945* (Chapel Hill, NC: Algonquin Books of Chapel Hill, 1990), 1-2.

[4] Charles M. Wiltse, *The Medical Department: Medical Service in the Mediterranean and Minor Theaters* (Washington, DC: Department of the Army Office of the Chief of Military History, 1965), 130-132.

[5] D'Este, *World War II in the Mediterranean*, 2, 4-5.

[6] George F. Howe, "Northwest Africa: Seizing the Initiative in the West," in *United States Army in World War II: The Mediterranean Theater of Operations* (Washington, DC: Department of the Army Center of Military History, 1993), 48.

[7] Wiltse, *The Medical Department*, 129.

functional echelons. In the combat zone, the unit (e.g., battalion or regiment), division, and army medical services consisted of organic, mobile formations.[8] Surgical hospitals (400-beds), evacuation hospitals (400 or 750-beds), and field hospitals (450-beds) supported the division and army level as the tactical situation required to provide a greater scope of medical care.[9] The communications zone contained semi-permanent general (1,000-beds) and station hospitals (250-1,000-beds), in which each provided definitive and convalescent care for all medical cases.[10] The final echelon was the zone of the interior, also known as the Continental US.

The divisions within the combat zone possessed varied organic medical assets. Infantry divisions each had one medical battalion consisting of a headquarters detachment, three collecting companies, and one clearing company. Armored divisions had one medical battalion consisting of a headquarters detachment, one collecting company, and one clearing company. The collecting companies supported each of the infantry regiments in the division. The collecting company collected patients from unit aid stations and the point of injury and transported to the collecting station, where casualties received second echelon emergency treatment and further evacuated to the clearing station. The clearing company also provided another second echelon of emergency medical treatment, temporary care of patients, and preparation for evacuation to a higher echelon of care or returned to duty.[11] Timely execution of patient movement rearward from the point of

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[8] War Department, Field Manual (FM) 8-10, *Medical Field Manual: Medical Service of Field Units* (Washington, DC: Government Printing Office, 1942), 1.

[9] War Department, Field Manual (FM) 100-10, *Field Service Regulations Administration* (Washington, DC: Government Printing Office, 1943), 99-101. Field hospitals were mobile, fixed bed hospitals designed to give definite treatment in the field where it was impractical to place fixed hospitals as stated in FM 100-10, 85.

[10] War Department, FM 100-10, 103-104. General and station hospitals were fixed hospitals located in the communications zone. General hospitals provided definitive treatment to all classes of patients within the theater of operations, while station hospitals served only the patients within the limited area in which they were located as stated in FM 10-10, 85.

[11] War Department, Field Manual (FM) 8-5, *Medical Field Manual: Mobile Units of the Medical Department* (Washington, DC: Government Printing Office, 1942), 74. The clearing station established by clearing companies or clearing platoons was the rearmost echelon in the division medical service as stated in FM 100-10, 95, 118.

injury relieved front line units of the burden of point of injury care. Patient hold capability in the combat zone facilitated rapid rehabilitation and return to duty. Timely patient movement and sufficient patient hold capability are critical for success in LSCO to maintain combat power and the initiative.

At the army level, the evacuation hospital was organic and under the direct control of the army commander. The basis of allocation was ten evacuation hospitals per army, each with a 750-bed total capability. During combat operations, the evacuation hospital was the vital link in the chain of evacuation in which casualties of all types passed through. The mission of the evacuation hospital was to provide treatment of all patients admitted to the hospital until they returned to duty or were transferred to a convalescent or general hospital. Capabilities included surgery, lab, x-ray, pharmacy, and dental. The evacuation hospital could perform six simultaneous surgeries totaling 192 surgeries per twenty-four-hour period, assuming surgical teams performed two eight-hour shifts.[12]

[12] War Department, FM 8-55, 185, 187, 195, 203, 214. Evacuation hospitals constitute the top of the funnel through which all casualties (less those evacuated by airplane) must pass in their transit from the combat zone to fixed hospitals in the communications zone. They normally established twelve to thirty miles or more from the battle front, near landing fields, on railroads, or on navigable waterways leading to the rear as stated in FM 100-10, 101.

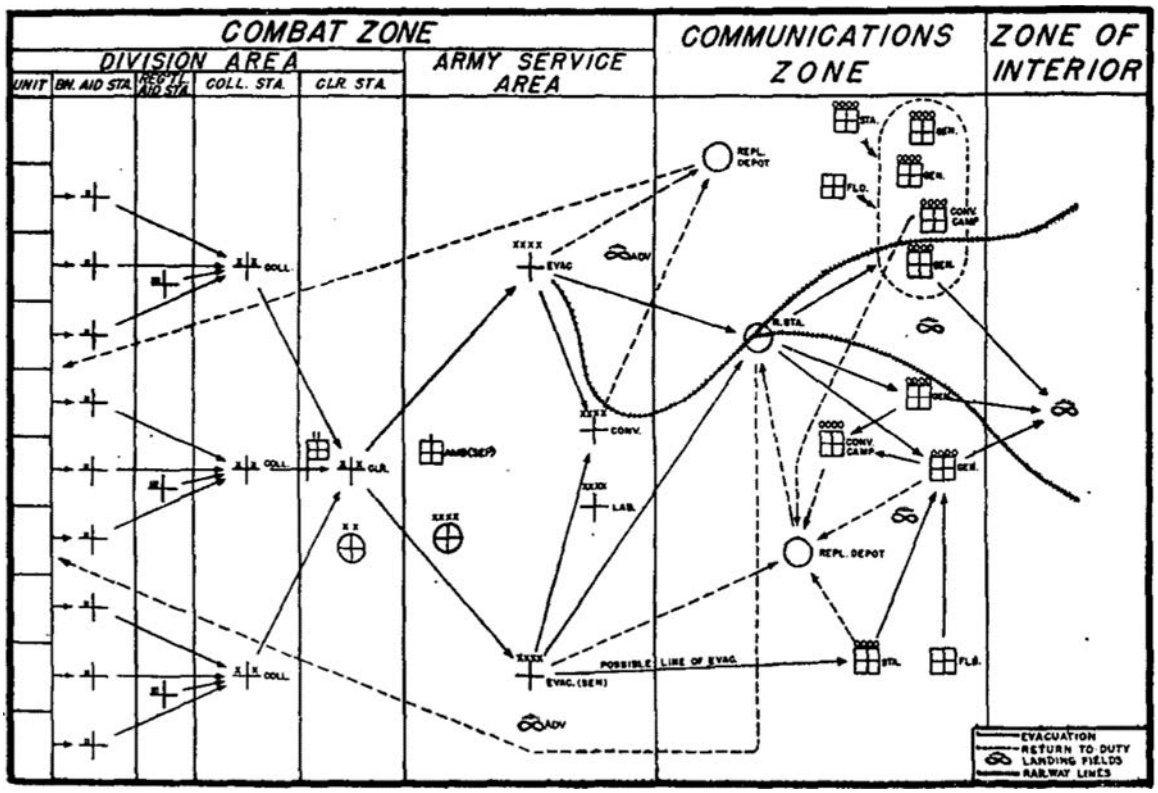

Figure 1. Evacuation and Hospitalization of Personnel. War Department, Field Manual 100-10, *Field Service Regulations Administration* (Washington, DC: Government Printing Office, 1943), 87.

The surgical hospital was an independent, self-supporting unit under the direct control of the army commander or the army surgeon. It executed surgical care to units in areas where wheeled transportation was extremely difficult or impossible.[13] The basis of allocation was four surgical hospitals per army. The surgical hospital consisted of one mobile surgical unit and two hospitalization units. The mobile surgical unit was self-sustaining and self-mobile. It could transport and install four operating rooms in a bus or van-type motor vehicle as well as existing shelters or tents. The hospitalization units could operate independently, thus permitting leapfrogging of hospitalization units and increased hospital mobility. The bed capacity of each hospitalization unit was 200 beds, totaling 400 for the surgical hospital. For comparison, today's Role 3 hospital center capability is 240 beds, nearly half the hospital bed capability of the surgical

[13] War Department, FM 100-10, 100.

hospital.[14] During WWII, a common practice called for the co-location of the surgical hospital and clearing station or connection by a clear road network. Following surgery, ground ambulances transported patients to evacuation hospitals, and airplane ambulances carried them to a general hospital in the communications zone.[15] Redundancy in evacuation capabilities proved essential when the enemy challenged air superiority. This is important in contemporary LSCO because the reliance on air evacuation in the limited contingency operations of Iraq and Afghanistan required a change in culture and practice to incorporate the importance of redundant evacuation platforms.

The hospital trains were independent units under the control of the surgeon of the communications zone or the regulating officer of the combat zone and generally executed medical evacuation between evacuation hospitals in the combat zone and general hospitals in the communications zone.[16] When available in the theater, airplane ambulances conducted medical evacuation between the combat zone and communications zone with the presence of suitable landing fields located within a short distance of a collection station.[17]

The Field Manual 8-55 hypothesized that in a theater of operations with one million soldiers and 425,000 expected to engage in combat daily, the theater evacuation policy dictated ninety days for disease and non-battle injuries, sixty days for gunshot wound injuries, and 120 days for gas. The average daily battle loss per thousand soldiers was 2.2 wounded-in-action casualties daily and 1.8 disease and non-battle injury casualties daily admitted to the hospital. The hospital bed requirement in sixty days was 68,915 and 75,281 in 150 days.[18] II Corps totaled

[14] US Department of the Army, *Army Health System Doctrine Smart Book* (Washington, DC: Government Printing Office, 2019), 78.

[15] War Department, FM 8-55, 219, 220, 223, 228, 232.

[16] War Department, FM 8-55, 290.

[17] War Department, FM 100-10, 107.

[18] War Department, FM 8-55, 60-62.

90,000 soldiers, and admitted 4,689 patients over the first seventy-five days and 19,688 over 134 days.[19]

The planning factor for hospital bed requirements based on the field manual evacuation policy was adequate for the early phase of the campaign, but not for the latter. The theater evacuation policy considerably influenced the rate at which patients accumulated and, thus, the planning factor for required hospital beds.[20] Due to the inadequate hospital bed capability in the latter phase of the Tunisia Campaign, casualties were evacuated out of the theater to the zone of the interior earlier than planned to clear bed space for new medical evacuees from the combat zone. The more frequent evacuations to the zone of the interior led to fewer soldiers returned to duty from theater and thus reduction of combat power. Adequate patient hold and intermediate care capability allow for a longer theater evacuation policy. In modern LSCO, the ability to rehabilitate in theater and return to duty is critical because it decreases the requirement for replacement troops and maintains combat power.

Theater Organization and Medical Structure

Health service support to II Corps in the Tunisia campaign planned for two evacuation hospitals and one surgical hospital for Operation Torch. II Corps planned for fixed hospitals to arrive between 20 November and 20 December 1942.[21] The initiation of operations experienced challenges due to the shipment of unit equipment on separate convoys from the personnel, which resulted in long lead times between the arrival of personnel followed by equipment and considerable confusion in its handling and storage. The lack of functional and standardized

[19] Richard T. Arnest, Headquarters II Corps (CTF), Office of the Surgeon, "Report of Medical Activities, II Corps, During Period 1 January to 15 May 1943, Inclusive," (San Antonio, TX: Army Medical Department (AMEDD) Center of History, 30 May 1943).

[20] War Department, FM 8-55, 60-62.

[21] United States War Department General Staff, *Logistical History of NATOUSA-MTOUSA: 11 August 1942 to 30 November 1945* (Naples, Italy: G. Montanino, 1945), 295.

packing led to damaged and non-functioning equipment due to missing parts and delay in the ability to establish full operational capability by the hospitals.[22] The delay in the full operational capability set back the timeframe in which the hospitals could receive and treat casualties.

Prior to arrival at hospitals, the divisions established organic medical treatment capability. The 1st Infantry Division established a clearing station at noon on D-Day in a small, dirty, and poorly equipped civilian hospital in Arzew, Oran Province. The Arzew hospital had seventy-five beds partially occupied by local nationals and French patients under the care of French doctors. The clearing platoon had minimal equipment until that evening. Most of the 48th Surgical Hospital (400-bed) personnel came ashore on the beach east of Arzew between 1530 and 1730 on D-Day without their equipment. The 48th Surgical Hospital began replacing the clearing station at the Arzew hospital so that the clearing station could move with the 1st Infantry Division and maintain forward health service support.[23]

[22] Richard T. Arnest, Headquarters II Corps (CTF), Office of the Surgeon, "Annual Report: Surgeon, II Corps," (San Antonio, TX: Army Medical Department (AMEDD) Center of History and Heritage, 10 January 1943).

[23] Arnest, "Annual Report."

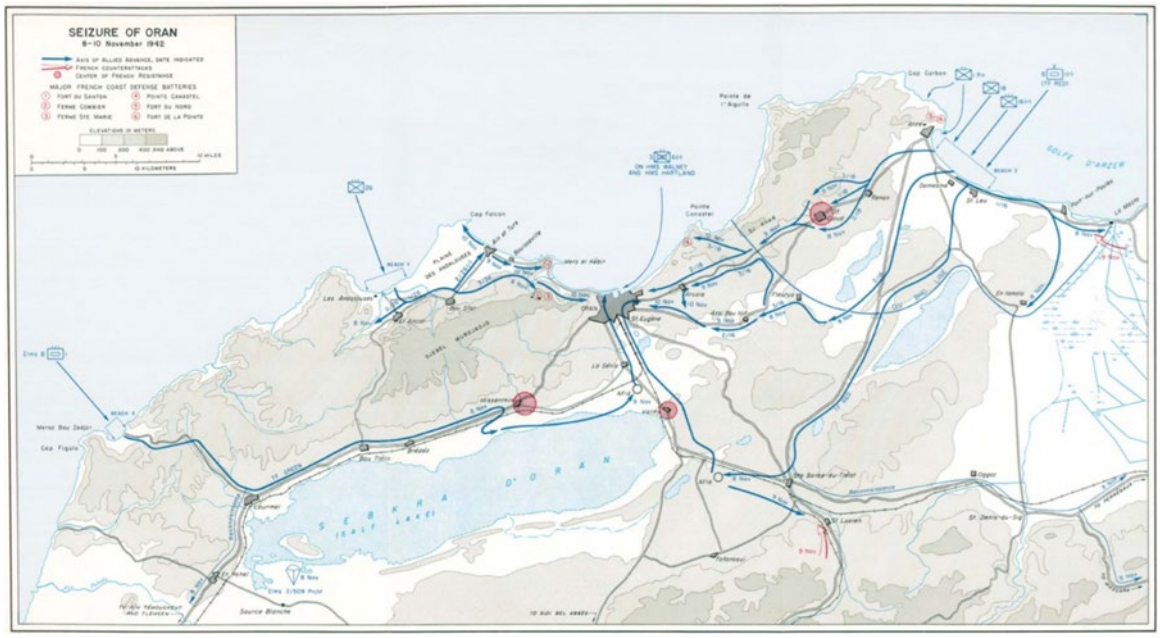

Figure 2. Seizure of Oran. George F. Howe, "Northwest Africa: Seizing the Initiative in the West," *United States Army in World War II: The Mediterranean Theater of Operations* (Washington, DC: Department of the Army Center of Military History, 1993), 753.

The 38th Evacuation Hospital (750-bed) landed on D+1 without equipment. Their equipment began arriving on the morning of D+2 and was transferred to the 48th Surgical Hospital for immediate use. The 77th Evacuation Hospital (750-bed) arrived D+3, and by D+5, the three hospitals had a total bed capacity of 1,900. The equipment of the 77th Evacuation Hospital had not come ashore. The lack of equipment forced them to operate with equipment borrowed from other units and the Oran civilian hospitals.[24] The 9th Evacuation Hospital (750-bed) and the 1st Battalion, 16th Medical Regiment arrived on 21 November; however, the equipment of the 1-16th Medical Regiment was lost at sea, and they operated a staging area until February 1943.[25] Based on these challenges, the executive officer of an evacuation hospital in support of II Corps, Lieutenant Colonel Edward Hashinger, observed that medical personnel and equipment should deploy together and essential items needed to be hand-carried. This practice

[24] Arnest, "Annual Report."

[25] Wiltse, *The Medical Department*, 120.

would allow the ability to maintain accountability and decrease the time between the arrival of personnel and operating capability of the hospital to receive and treat casualties.[26] The contemporary Role 3 hospital center is 35 percent self-mobile in a single lift for one field hospital to ensure emergency medical treatment is fully operational within twenty-four hours of arrival and initial surgical capability within seventy-two hours.[27] The ability to organically move and transport equipment in present-day LSCO is important because the delay of equipment arrival in the fluid nature of operations costs lives if hospitalization is unavailable.

The mobile units of II Corps began staging for the next phase after the activation of the Mediterranean Base Section on 8 December 1942 and the subsequent arrival of fixed hospitals.[28] The arrival of fixed hospitals in January increased the hospitalization capability with two general hospitals, one station hospital (750-beds), two station hospitals (500-beds each), and four station hospitals (250-beds each), totaling 7,400 fixed hospital beds in the communications zone in addition to the already existing mobile capability of 1,900 beds, totaling 9,300 hospital beds.[29] Despite the increased capability, the number of hospital beds was insufficient for the corps and limited the patient rehabilitation timeline and evacuation throughput of casualties from the combat zone.

[26] Edward H. Hashinger, "An Evacuation Hospital at the Front," *Military Review* 24, no. 3 (June 1944): 68-71.

[27] United States Army Medical Department Center and School, "Field Hospital Staff Book" (August 2017): 71.

[28] Wiltse, *The Medical Department*, 120. Base Sections were US Army logistical support groups located in the communications zones as stated in *Logistical History of NATOUSA-MTOUSA: 11 August 1942 to 30 November 1945*, 23.

[29] Arnest, "Annual Report."

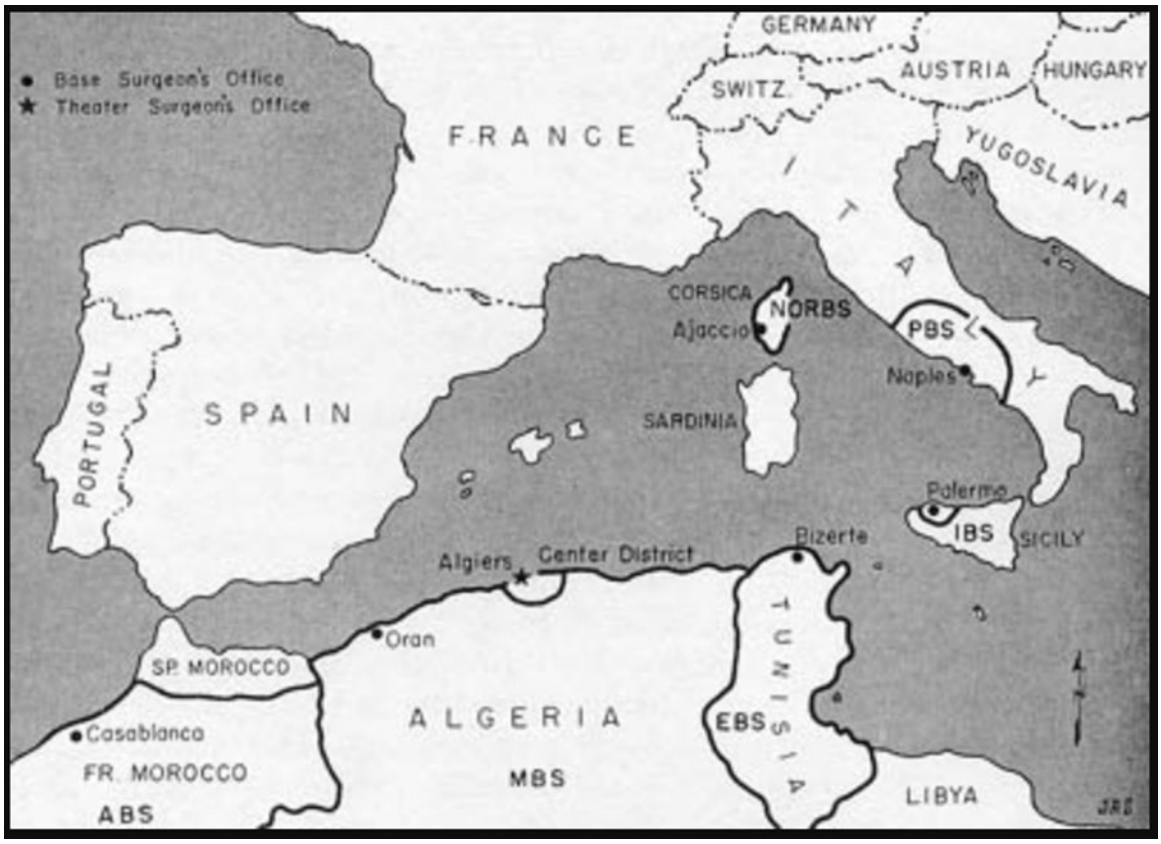

Figure 3. Theater Organization of North Africa. Blanche B. Armfield, *Organization and Administration in World War II*, ed. John Boyd Coates and Charles M. Wiltse (Washington DC: Office of the Surgeon General, Department of the Army, 1963), accessed 22 January 2020, https://history.amedd.army.mil/booksdocs/wwii/orgadmin/map2.jpg.

Upon arrival in the Tébessa, Algeria, area with the II Corps headquarters, the 9th Evacuation Hospital established in the vicinity of twelve miles south of Tébessa. The 48th Surgical Hospital established one hospitalization section (200-beds) at Feriana and the other in the vicinity of Thala. Each section was more than fifty miles from the forward line of troops, which increased the challenges of medical evacuation regarding time-distance to reach hospitalization and turn-around time for ambulances to provide desired evacuation throughput. The 77th Evacuation Hospital remained in reserve until 14 February when it established operations twelve miles south of Tébessa. From 16-20 February 1943, all medical treatment facilities withdrew to the vicinity of Aine Beida, paralleling the Axis advance in the Battle of Kasserine Pass. During the withdrawal, approximately 700 patients moved with the hospitals due

to a lack of evacuation facilities to the rear.[30] Based upon II Corps' hospital admissions during this phase, in relation to the current hospitalization capability, they would require thirty-four thirty-two-bed field hospitals or five 240-bed hospital centers, which is 29 percent of the total Army inventory. Contemporary hospital centers lack organic patient movement capability and therefore rely on the availability of evacuation assets to support the movement of patients prior to and during hospital relocation on the battlefield.[31]

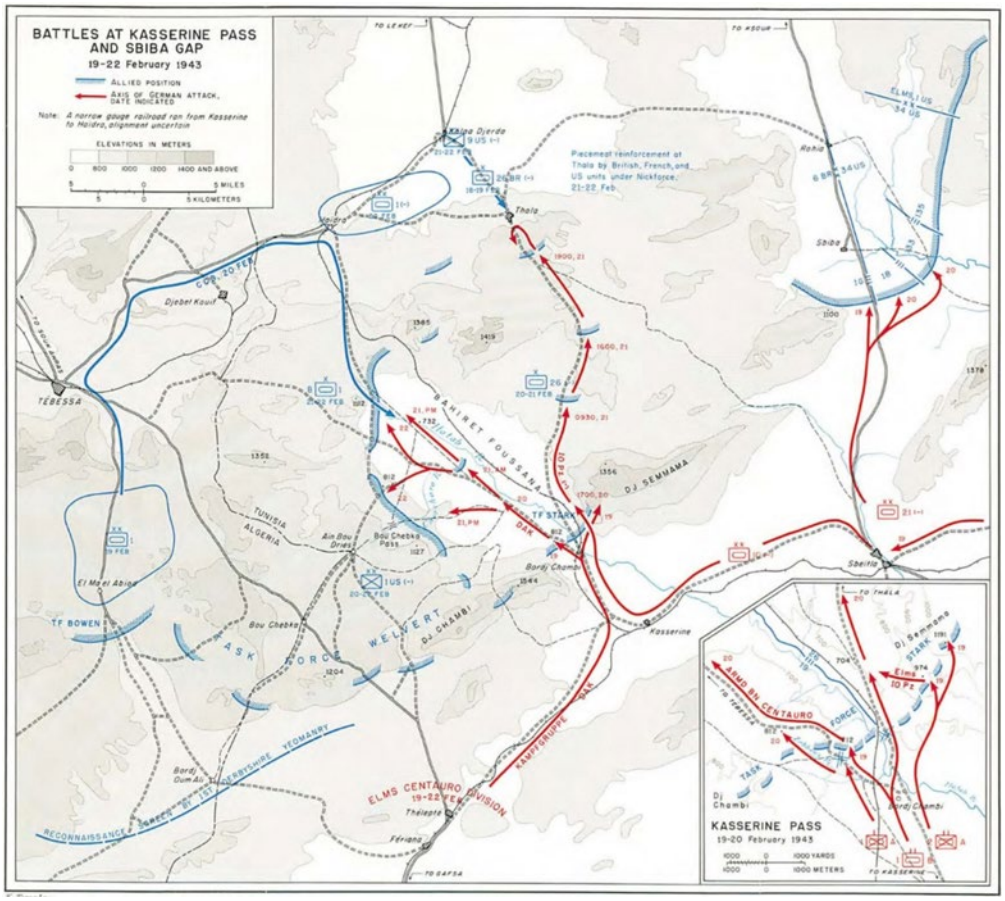

Figure 4. II Corps in Kasserine Pass. George F. Howe, "Northwest Africa: Seizing the Initiative in the West," *United States Army in World War II: The Mediterranean Theater of Operations.* Washington, DC: Department of the Army Center of Military History, 1993, 757.

The ability of the 48th Surgical Hospital to self-transport with its organic transportation assets allowed them to move independently of corps-level transportation and leapfrog units to the

[30] Arnest, "Report of Medical Activities."

[31] US Department of the Army, *Army Health System Doctrine Smart Book*, 86.

rear to maintain patient care and move to a safer location. On 17 February, the 48th Surgical Hospital moved again to Youks-les-Bains and began receiving patients from both evacuation hospitals within six hours of arriving.[32] The 750-bed evacuation hospitals had no organic vehicles, thus relied on transportation assets from corps to move them. In the disintegrating situation, their priority of movement was low, and the danger of enemy engagement was great. The inability to self-move by the larger hospital units kept them so far behind the forward line of troops that lines of communication over 100 miles between clearing stations and the hospital were common, over three times the distance recommended by field manuals of the time. To mitigate the absence of hospitals closer to the forward line of troops, teams from the 2nd Auxiliary Surgical Group augmented the clearing stations and provided critical surgical capability.[33] Pushing surgical assets forward is critical in saving patients' lives in LSCO because transporting wounded to a surgical capability plays a vital role in survivability. The availability of bed space for hospitalization and holding is critical to prevent overwhelming military treatment facilities at all levels. Forward treatment and all echelons of care is necessary for patient stabilization and provides the hospitals time to clear beds prior to the receipt of more patients.

Following the Allied tactical defeat at the Battle of Kasserine Pass, the corps increased combat power by bringing additional divisions to take the offensive tactically. II Corps' major units included three infantry divisions and one armored division, plus corps support units, totaling 90,000 troops. A request for additional medical forces included one field hospital, one 400-bed evacuation hospital, and additional ambulances; however, nothing arrived until after the peak load of casualties passed. The corps lines of communication extended approximately 100 miles from

[32] Wiltse, *The Medical Department*, 126.

[33] Wiltse, *The Medical Department*, 127. Auxiliary surgical groups were composed of small administrative units plus other various types of teams, such as surgical, orthopedic, shock, gas, maxillofacial, neurosurgical, thoracic surgical, dental prosthetic, and miscellaneous teams. The teams reinforced other medical units as stated in FM 100-10, 103-104.

Maktar to the east of Gafsa. An additional six surgical teams, four shock teams, and one orthopedic team attached to the corps and augmented the clearing stations, surgical hospital, and 400-bed evacuation hospitals.[34]

The two 750-bed evacuation hospitals and the 400-bed surgical hospital were adequate for the troops initially involved in the Battle of Kasserine Pass. The evacuation hospitals were under a fifteen-day evacuation policy to facilitate the return to duty of as many soldiers as possible to forward areas and maintain combat power. Surgical teams attached to clearing platoons and corps medical battalions to fill the gap between divisional units and the rear hospitals.[35] The attached surgical teams also mitigated the challenge of the evacuation distances of 100 miles to the corps hospitals. They demonstrated the resilience of the AHS to provide health service support despite the Allied defeat. Today's AHS has forward resuscitation and damage control surgery capability with the forward resuscitative surgical teams (FRST). The FRST does not provide hospitalization or bed-hold capability beyond the twenty or fourty-bed patient hold of the attached Role 2 and can easily become overwhelmed by mass casualties when evacuation to the field hospital is slow or unavailable.[36] The high number of casualties in modern LSCO requires the large-capacity bed space of WWII mobile hospitals.

In mid-March, the II Corps front line covered 250 miles between Gafsa and Fondouk in the first major operation by II Corps in Tunisia. The 9th Evacuation Hospital (750-bed), 77th Evacuation Hospital (750-bed), and the 48th Surgical Hospital (400-bed) supported the four-division attack. The two evacuation hospitals were insufficient to manage the patient load during the peak influx of casualties. The 48th Surgical Hospital split its sections to support casualties from the Gafsa-El Guettar and Maknassay-El Guattar areas on 22 March. A platoon of the 51st

[34] Arnest, "Report of Medical Activities."

[35] Arnest, "Report of Medical Activities."

[36] US Department of the Army, *Army Health System Doctrine Smart Book*, 109.

Medical Battalion set up in the French Hospital at Gafsa with two surgical teams and two shock teams attached to provide far-forward surgical intervention and hospitalization until the 48th Surgical Hospital established in Gafsa.[37]

Surgical and shock teams augmented the clearing platoons of the 2nd Battalion, 16th Medical Regiment established at Sbeitla and Maknassy in support of the 34th Infantry Division and 1st Armored Division until the newly arrived 15th Evacuation Hospital established operations on 10 April.[38] The evacuation distance was fifty miles from Maknassy and 100 miles from Sbeitla to the 48th Surgical Hospital. With the surgical augmentation, the clearing platoons were able to provide surgical capability and hold non-transferrable patients due to their condition and the distance.[39] Sustaining combat power and patient survivability in contemporary LSCO is necessary for mission success. It requires a large-capacity of hospital beds to prevent overwhelming the medical treatment facilities with mass casualties.

The II Corps forces built up a concentration in the North Sector during the period of mid-April in preparation for the North Sector Campaign. The primary focus of the health service support plan included the closure of corps medical facilities in the Tébessa area, evacuation of patients to the communications zone, and the movement and re-establishment of medical units in the North Sector to support the tactical units.[40] The movement of the II Corps medical support units for the concentration of troops in the North Sector established lines of communication approximately seventy miles to the objective of Bizerte, Tunisia, to maintain manageable medical evacuation timelines and survivability of casualties.

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[37] Arnest, "Report of Medical Activities."

[38] Arnest, "Report of Medical Activities."

[39] Wiltse, *The Medical Department*, 129.

[40] Arnest, "Report of Medical Activities."

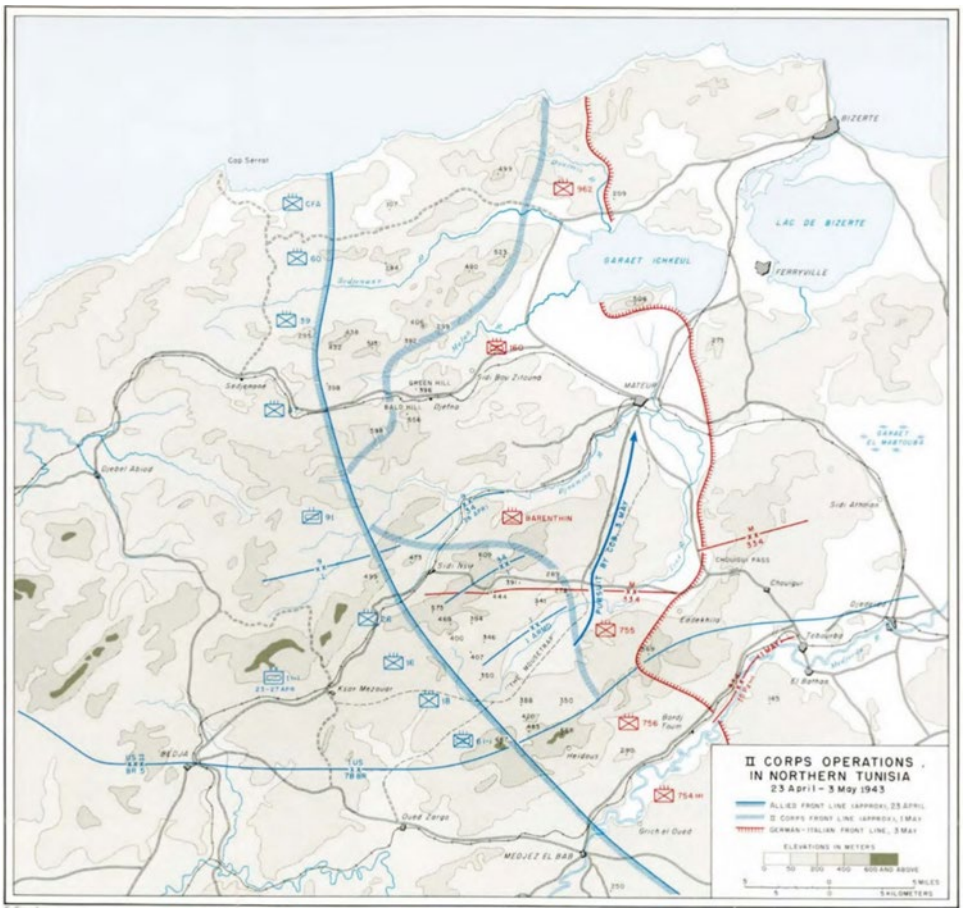

Figure 5. II Corps in Northern Tunisia. George F. Howe, "Northwest Africa: Seizing the Initiative in the West." *United States Army in World War II: The Mediterranean Theater of Operations*, Washington, DC: Department of the Army Center of Military History, 1993, 760.

Units remained in place at the initiation of the North Sector Campaign on 23 April. The 48th Surgical Hospital reorganized on 1 May as the 128th Evacuation Hospital (400-bed) and established operations twenty miles northeast of Beja on 4 May. The 2nd Auxiliary Surgical Group attached four surgical teams and three shock teams to the 15th Evacuation Hospital and two surgical teams and two shock teams to the 128th Evacuation Hospital. The augmented surgical and shock teams were vital to unit success during heavy periods of casualties.[41]

The 15th Evacuation Hospital closed on 4 May and established operations 6 May twelve miles northeast of Mateur. The 9th Evacuation Hospital closed 7 May and moved to the French

[41] Arnest, "Report of Medical Activities."

hospital at Michaud, two miles west of Mateur. At the close of the campaign, all four corps hospitals were functioning with a total of 465 patients in the hospital on 9 May. From 9-15 May, the 400-bed evacuation hospitals closed for admissions, and all patients moved to the 9th Evacuation Hospital. On 12 May, II Corps hospitals had 1,045 patients, 745 of whom were enemy. During the period of 1 January to 15 May, hospital admissions for II Corps totaled 19,688. There were 4,820 casualties returned to duty, and 13,911 casualties evacuated to the communications zone.[42] Bed space in II Corps mobile hospitals in the Tunisia campaign was adequate with the appropriate adjustment of the evacuation policy, but the equipment was again a challenge.[43] The 1,900 mobile hospital beds of II Corps admitted 19,688 patients of the 90,000 corps population by adjusting the evacuation policy to facilitate patient throughput as necessary to clear beds for additional casualties. Mission success in modern LSCO requires adequate hospitalization to support the large numbers of casualties.

The unexpected difficult nature of the terrain and long lines of communication in the Tunisia campaign led to challenges in medical evacuation. Poor traction for ambulances in the sand led to the improvised use of Jeeps for evacuation over difficult terrain.[44] Lines of evacuation were long and indirect, and over roads that could be traveled safely only at night. Ambulances were insufficient in number and augmented by trucks and litter-Jeeps.[45] Following the Allied defeat at the Battle of Kasserine Pass, II Corps executed evacuation from the forward units by the 51st Medical Battalion and the 2nd Battalion, 16th Medical Regiment. The 51st Medical Battalion conducted evacuation from clearing platoons to the hospitals. Until 16 February, evacuation to the communications zone was by air, when operations ceased due to flying

[42] Arnest, "Report of Medical Activities."

[43] Wiltse, *The Medical Department*, 121.

[44] Wiltse, *The Medical Department*, 121.

[45] Wiltse, *The Medical Department*, 126.

conditions. The British 6th Motor Ambulance Corps then executed ground evacuation to the communications zone for the corps to provide evacuation redundancy and mitigate the loss of air evacuation.[46]

In mid-March, during the first major operation by II Corps in Tunisia, the evacuation policy to the communications zone was lowered in all units to clear beds and maintain patient throughput to treat the high number of casualties. The 51st Medical Battalion and 2nd Battalion, 16th Medical Regiment had difficulty evacuating from four divisions due to long lines of communication and rough terrain. Tactical vehicles augmented ambulances extensively for casualty evacuation. A company of the 1st Battalion, 16th Medical Regiment, moved to the vicinity of Youks-les-Sains and conducted evacuation by road to the communications zone. 1-16 Medical Regiment also evacuated patients from the two 750-bed evacuation hospitals to the airport and railroad station in Tébessa.[47] The availability of evacuation by railroad and air allowed wheeled ambulances and tactical vehicles to execute frequent turns within the combat zone and assisted in maintaining open beds available for patient throughput. Adequate capability and redundancy in evacuation capability is key to success in contemporary LSCO when air superiority is not guaranteed.

The evacuation capability was sufficient from the division clearing stations. The tactical situation was such that the 400-bed evacuation hospitals established operations within twelve to fifteen miles from the clearing stations, thus maintaining short ambulance turn-around times to the 750-bed evacuation hospitals. No air evacuation was initially available in the area. The closest hospital to accept patients was the 77th Evacuation Hospital located eighty-five to 110 miles away over rough terrain and roads near Bone. The distance was too great for seriously wounded patients, particularly chest and abdominal wounds. With the establishment of the 128th

[46] Arnest, "Report of Medical Activities."

[47] Arnest, "Report of Medical Activities."

Evacuation Hospital six miles south of Baja on 8 May, the evacuation problem significantly improved with the decreased evacuation distance and availability of both air and rail evacuation from this point. Three 400-bed evacuation hospitals conducted operations during the campaign without a fixed hospitalization policy; therefore, patients were evacuated to the rear as quickly as their condition permitted to maintain patient throughput and available hospital beds. After 3 May, evacuation of all patients out of the area was to the 38th Evacuation Hospital, another Eastern Base Section unit.[48]

The II Corps chain of evacuation started at forward evacuation hospitals by ground ambulance and rail to Eastern Base Section hospitals in the communications zone. Evacuation by air went directly to fixed hospitals in the vicinity of Algiers and Oran. The airfields in Tébessa and Youks-les-Bains served as the starting points for evacuation to the communications zone during the Kasserine and southern Tunisian battles. In the final phase of the campaign, the evacuation of patients was from Tabarka to Bone, the railhead at Souk el Khemis to Constantine, and from airfields at Souk el Arba and Sidi Smail to Oran, maximizing all three evacuation platforms.[49] Between 1 January and 15 May 1943, II Corps evacuated 13,911 casualties to the communications zone, of which ambulances and tactical vehicles evacuated 9,110 by road, 1,488 by rail, and 3,313 by air.[50] Inadequate medical evacuation capability in modern LSCO risks threatening the operational mission by draining combat power to secure and treat casualties at the forward line of troops and overwhelming forward medical treatment capabilities of medical providers and available equipment.

[48] Arnest, "Report of Medical Activities."

[49] Wiltse, *The Medical Department*, 137.

[50] Arnest, "Report of Medical Activities."

Analysis

The II Corps AHS provided health service support to the 90,000 soldiers of II Corps, admitted 19,688 casualties to corps hospitals in the combat zone, and evacuated 13,911 to the communications zone for further care. The theater evacuation policy dictated by Field Manual 8-55 of ninety days to 120 days, depending on the mechanism of injury, led to a hospital bed planning factor for a population of one million soldiers of 68,915 in sixty days and 75,281 in 120 days. At the height of casualties during the Tunisia Campaign, II Corps had a mobile hospital capability of 1,900 beds in the combat zone and 7,400 fixed hospital beds in the communications zone. II Corps adjusted the theater evacuation policy frequently, based on the hospitals' bed status, to maintain movement of casualties to the rear and sustain the capability to receive new casualties from the division clearing stations. Due to the inadequate hospital bed capability during the latter campaign, many casualties required evacuation to the communications zone and zone of the interior who otherwise may have returned to duty under the doctrinal evacuation policy.

Equipment was a challenge for the medical units of II Corps, particularly early in the campaign. Personnel and equipment deployed in separate convoys and personnel arrived ahead of their units' equipment. Equipment often arrived with missing or broken parts due to a lack of functional packing before movement. Medical personnel borrowed equipment from other units and civilian hospitals to mitigate the lack of capability. The transportation of personnel and equipment together and hand-carrying essential items mitigate the lack of accountability and decrease the time between the arrival of personnel and operating capability of the hospital to receive and treat casualties. The ability for hospitals to self-transport personnel and equipment together rather than rely on outside transportation assets and compete for the priority of movement on the fluid LSCO battlefield is essential for timely movement and establishment of hospital operations and patient care.

Surgical hospitals were the only mobile hospital capability that maintained organic transportation assets, and therefore a self-lift capability. The mobile surgical unit and hospitalization units of the surgical hospital were independently self-sustaining, self-mobile, and operational, thus permitting increased hospital mobility throughout the combat zone as the operational environment dictated. The evacuation hospitals relied on corps transportation assets for movement. This consequently required them to fight for the priority of movement of shared division assets as dictated by the division timelines. The result was extended evacuation lines of communication as the units continued forward movement.

Medical evacuation faced unexpected challenges in the Tunisia campaign due to the difficult terrain and long lines of communication exceeding 100 miles at times. Ambulances were insufficient in number and augmented by tactical vehicles. II Corps lowered the evacuation policy to the communications zone in all units throughout the campaign to clear beds and maintain the capacity to treat the high number of casualties. The availability of air evacuation was inconsistent due to the changing operational environment. The redundancy of the hospital trains' capability to evacuate to the communications zone mitigated the loss of air evacuation and road distances of up to 500 miles. LSCO challenges air superiority, and redundant evacuation capability prevents the culmination of forward medical treatment facilities in support of the operational mission.

Contemporary Large-Scale Combat Operations and Army Health System

Large-Scale Combat Operations

LSCO against a capable peer or near-peer enemy will be more demanding in operational tempo and lethality than limited contingency operations of Iraq and Afghanistan. Battlefields in LSCO have historically been more chaotic, intense, and highly destructive than those the US has experienced in counterinsurgency operations.[51] Adversaries will challenge the US in multiple domains, including air, maritime, land, space, and cyberspace. Enemies are likely to prevent US forces from projecting and sustaining combat power into a region by employing anti-access strategies.[52] The increased lethality of LSCO results in an increased probability of casualties and places a burden on medical resources due to the magnitude of the forces involved.[53] The AHS capability should evolve to be ready to manage the burden and save lives.

The Army Health System

The AHS is a system of systems responsible for the operational management of Health Service Support (HSS) and Force Health Protection (FHP). These are each part of the sustainment and protection warfighting functions, respectively. The AHS includes all mission support services performed, provided, or arranged by the Army Medical Department to support HSS and FHP mission requirements.[54] In the counterinsurgency operating environment, HSS has allowed for medical capabilities to overmatch casualty estimates.

Today's Army Health System distributes medical resources and capabilities into roles of care at various levels of command to provide Health Service Support and Force Health Protection

[51] US Army, FM 3-0, 1-2-1-3.

[52] US Army, FM 3-0, 5-6.

[53] US Army, FM 3-0, 2-49.

[54] US Department of the Army, Field Manual (FM) 4-02, *Army Health System* (Washington, DC: Government Printing Office, 2013), 1-2.

at the tactical and operational levels. Role 1 and 2 capabilities are those that provide immediate lifesaving measures and advanced trauma management. The medical platoon provides Role 1 care, which includes immediate life-saving measures and collection of casualties from the point of injury or supported units.[55] The medical platoon resides in each maneuver and fires battalion in the brigade combat team.

The brigade support medical company provides Role 1 and Role 2 care and resides in the brigade combat team (Armor, Infantry, Stryker, and Airborne) and can hold twenty patients for up to seventy-two hours. The evacuation platoon executes ground MEDEVAC within the brigade area of operations. It is 100 percent mobile and capable of moving all personnel and equipment in a single lift.[56] The medical company (area support) resides in the multifunctional medical battalion within the medical brigade (support). It provides the same capability of the brigade support medical company on an area support basis, with the exception that it provides patient hold for forty patients for up to seventy-two hours.[57]

[55] US Army, FM 4-02, 1-8.

[56] US Army, *Army Health System Doctrine Smart Book* 120-122.

[57] US Army, *Army Health System Doctrine Smart Book*, 116-118.

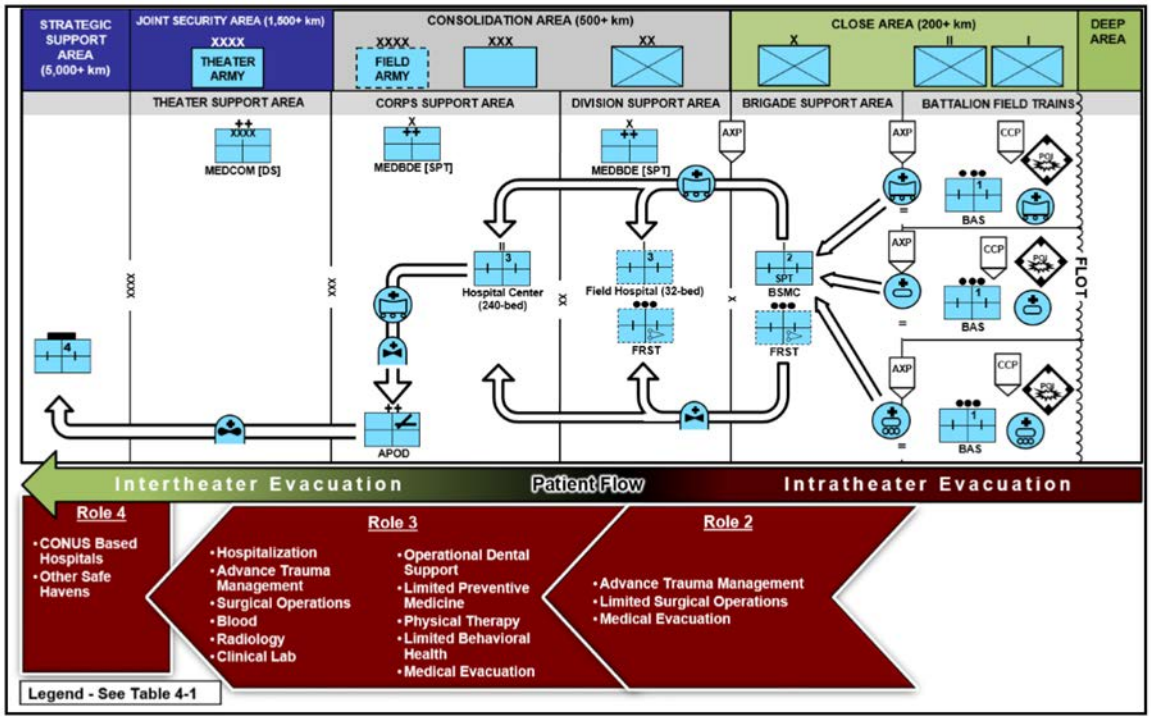

Figure 6. Hospitalization in LSCO. US Department of the Army, *Army Health System Doctrine Smart Book* (Washington, DC: Government Printing Office, 2019), 179.

The forward resuscitative surgical team (FRST) belongs to the medical brigade (support). It provides resuscitation and damage control surgery while attached to a hospital center or Role 2 medical treatment facility. The FRST can execute thirty surgeries in seventy-two hours and hold eight patients for up to six hours post-surgery. It is fully self-mobile and self-transportable using organic transportation assets to reach initial operating capability within ninety minutes of arrival. The basis of allocation is one per committed armor or infantry (less airborne) brigade combat team.[58] The current army force structure includes thirty-seven FRSTs, sixteen armor, and twenty-eight infantry brigade combat teams (less airborne). There are three airborne FRSTs and five infantry brigade combat teams (airborne).[59] If every brigade combat team simultaneously commits to the battle, there is a shortage of seven FRSTs and two airborne FRSTs in the Army

[58] US Army, *Army Health System Doctrine Smart Book*, 109-110.

[59] US Army Directorate of Force Management, "FMSWeb," 2019, accessed 17 October 2019, https://fmsweb.fms.army.mil.

force structure. The auxiliary surgical groups of WWII similarly augmented the infantry divisions' clearing stations and provided critical surgical capability in the absence of hospitals close to the forward line of troops.

Hospitalization

The Army is currently executing the field hospital force design update, which converts the combat support hospital (248-bed) to the hospital center and field hospital Role 3 structure. Role 3 provides care to all categories of patients, including resuscitation, initial wound surgery, damage control surgery, and postoperative treatment.[60] The modular and scalable force structure of the hospital center and field hospital provides the commander options depending on the operational environment and population at risk. The headquarters and headquarters detachment (HHD), hospital center, and field hospital (thirty-two-bed) comprise the core and lowest denominator of the hospital center and reside in the medical brigade (support). The HHD, hospital center can command and control up to two field hospitals (thirty-two -bed) with hospital augmentation detachments, totaling up to a 240-bed hospital configuration. Augmentation detachments include the hospital augmentation detachment (medical thirty-two-bed), hospital augmentation detachment (surgical twenty-four-bed), and hospital augmentation detachment (ICW sixty-bed).[61]

[60] US Army, FM 4-02, 1-9.

[61] US Department of the Army, *Army Health System Doctrine and Smart Book* (Washington, DC: Government Printing Office, 2019), 78.

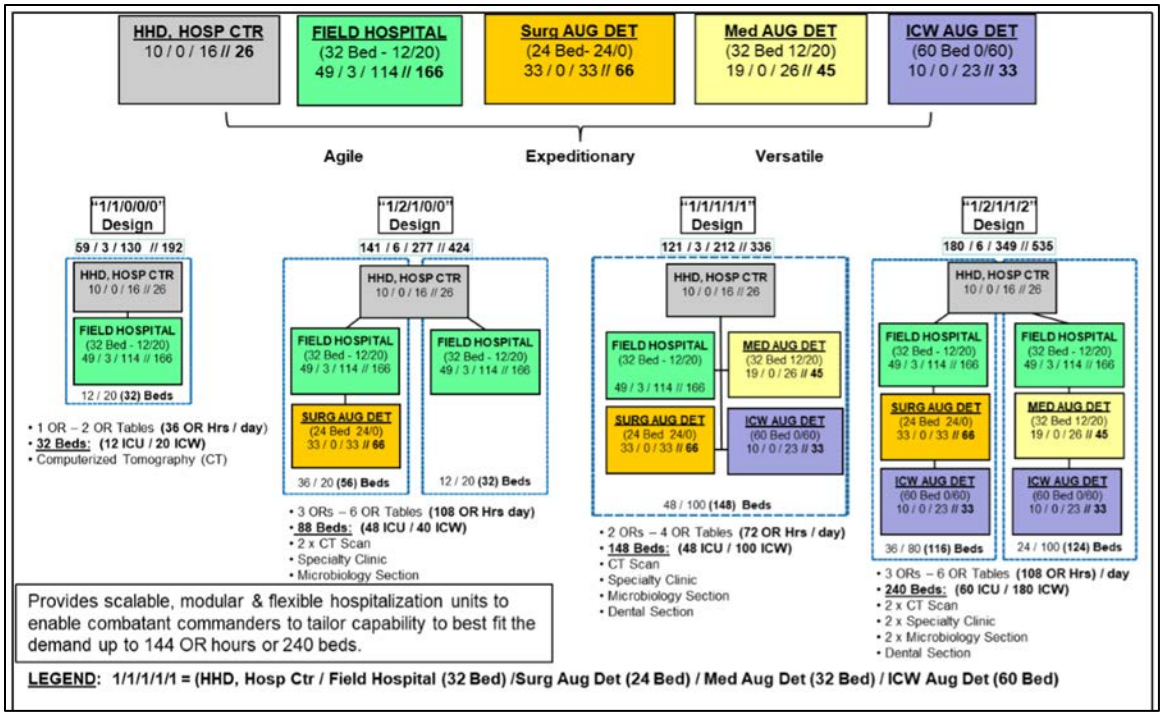

Figure 7. Possible Hospital Center Configurations. US Department of the Army, *Army Health System Doctrine Smart Book* (Washington, DC: Government Printing Office, 2019), 83.

The field hospital basis of allocation is 1.11 field hospitals per 100 wounded in action and 0.66 field hospitals per 100 disease and non-battle injury casualties. The field hospital (thirty-two-beds) provides hospitalization of up to thirty-two patients and surgical capability on two operating room tables capable of providing thirty-six operating room hours per day. This capability increases when augmented by the medical, surgical, and intermediate care ward (ICW) detachments. The hospital augmentation detachment (surgical) provides two operating room tables. A 240-bed hospital center provides six operating tables and 108 operating hours per day.[62] WWII mobile hospitals in the combat zone included evacuation hospitals with a 400 or 750-bed capability, surgical hospitals with a 400-bed capability, and field hospitals with a 450-bed capability. II Corps in the Tunisia Campaign had a mobile hospital capability totaling 1,900 beds, which is 46 percent of the total Role 3 hospitalization capability in the AHS today.

[62] US Department of the Army, *Army Health System Doctrine Smart Book*, 83.

The HHD, hospital center employs the field hospital (thirty-two-beds). An individual field hospital does not split. To provide Role 3 hospitalization in two locations, the HHD, hospital center provides command and control to two field hospitals in two different locations. The HHD, hospital center will collocate with one field hospital.[63] The hospital augmentation detachments are dependent on the field hospital and hospital center and cannot operate independently.[64] The surgical hospitals of WWII consisted of one mobile surgical unit and two hospitalization units, each independently capable. This permitted echeloning of hospitalization units and increased hospital mobility. The hospitalization units' ability to operate independently increased flexibility and mobility in support of the fluid nature of the battlefield and movement of troops.

Assuming thirty-five hospital admissions per day, including wounded in action and disease and non-battle injury as dictated in the *Field Hospital Operations*, Special Text 4-02.10, the expected bed occupancy at thirty days is 900 wounded in action, 870 disease and non-battle injuries, fifteen nerve, and twenty blister patients.[65] To support this bed occupancy workload, the area of operations requires nine hospital centers, eighteen field hospitals (thirty-two-beds), twelve hospital augmentation detachments (surgical, tewnty-four-beds), sixteen hospital augmentation detachments (medical, thirty-two-beds), and fifteen hospital augmentation detachments (ICW, sixty-beds). The Role 3 capability results in 2,640 beds with 1,805 occupied.[66] Additional beds account for a 20 percent dispersion allowance to accommodate shut-down and movement of hospitals and separation of enemy prisoner of war patients and isolation of patients with

[63] US Army, *Army Health System Doctrine Smart Book*, 86.

[64] US Army, *Army Health System Doctrine Smart Book*, 93.

[65] US Department of the Army, Special Text (ST) 4-02.10, *Field Hospital Operations*. (Washington, DC: Government Printing Office, 2017), 3-8.

[66] US Army, ST 4-02.10, 3-10.

communicable diseases.[67] The admission of thirty-five patients per day requires 64 percent of the total hospitalization capability in the army inventory.

The field hospital (thirty-two-beds) is 35 percent mobile with organic transportation assets organic to the HHD, hospital center. It can establish full-operating capability in seventy-two hours, assuming timely arrival of personnel and the remaining 65 percent of the equipment. An additional forty-eight to seventy-two hours are required to reach full operating capability for the 240-bed hospital center.[68] Self-mobility is significantly reduced when the hospital center commands and controls more than one field hospital due to the transportation assets residing in the HHD, hospital center.[69] The evacuation hospitals of WWII possessed no organic transportation assets and relied on the corps to move them. The priority of movement for the evacuation hospitals was low, which left them over 100 miles from clearing stations during disintegrating situations. The surgical hospitals' mobility allowed them to move independently and maintain patient care as the divisions moved forward.

The Army Role 3 operating force globally available will be 4,104 beds and 112 operating tables in the fiscal year 2022 upon completion of all hospital force design updates. The force design update reflects the degradation of 2,344 beds and forty-four operating room tables from the previous combat support hospital employed post-Cold War through limited contingency operations. The degradation is a concerning risk to force and mission in a LSCO environment that expects increased casualties. II Corps had nearly double the hospital bed capability at 9,300 in North Africa during WWII.[70]

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[67] US Army, ST 4-02.10, 3-6.

[68] US Department of the Army, *Army Health System Doctrine Smart Book*, 86, 90. Set-up data for the 240-bed hospital center is approximate due to limited training and execution of the 240-bed hospital at time of publication.

[69] United States Army Medical Department Center and School, "Field Hospital Staff Book" (August 2017): 71.

[70] US Army, FM 4-02, 3-3, 3-11. The Law of Land Warfare outlines AHS obligation in the treatment of enemy sick and wounded, civilian sick and wounded, and detainees. Consideration of the

Medical Evacuation

Medical evacuation (MEDEVAC) involves a dedicated platform by ground or air via rotary-wing or fixed-wing with medical personnel and equipment to provide en route care to a medical treatment facility. Casualty evacuation (CASEVAC) is the unregulated movement of casualties without en route care or medical personnel and equipment.[71] The medical company (ground ambulance) provides MEDEVAC with twenty-four ambulances. It has a single-lift capability for the evacuation of ninety-six litter patients or 192 ambulatory patients. It resides in the medical brigade (support) with the mission to provide direct support to brigade combat teams and area support to functional brigades. The basis of allocation for the medical company (ground ambulance) is 0.33 per brigade combat team, 0.5 per division headquarters, and two per senior Army headquarters.[72] In the Tunisia Campaign, II Corps used ground ambulances and tactical vehicles for MEDEVAC and CASEVAC between all levels of care and between the combat zone and communications zone. Hospital trains transported patients between evacuation hospitals in the combat zone and general hospitals in the communications zone, and airplane ambulances conducted MEDEVAC between the combat zone and communications zone.

additional resources required to evacuate and medically treat these populations is necessary to prevent overwhelming capabilities available.

[71] US Army, FM 4-02, 1-4, 1-5.

[72] US Department of the Army, *Army Health System Doctrine and Smart Book* (Washington, DC: Government Printing Office, 2019), 126.

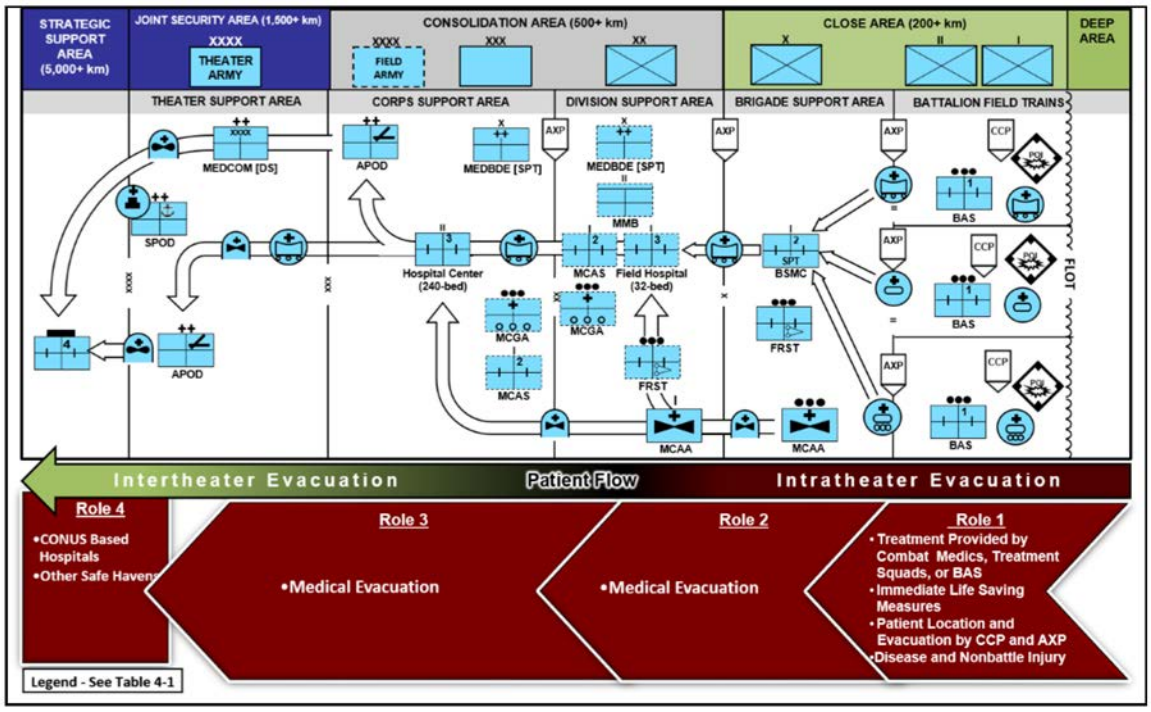

Figure 8. Medical Evacuation in LSCO. US Department of the Army, *Health System Doctrine Smart Book* (Washington, DC: Government Printing Office, 2019), 180.

The current army inventory includes twenty-seven ground ambulance companies.[73] The eighteen divisions and fifty-four brigade combat teams in the army require twenty-seven medical companies (ground ambulance). Multiple factors may influence the necessary number of medical companies (ground ambulance) to support operations. Long ground lines of communication decrease ambulance turn-around times and evacuation throughput. Area support in the area of operations influences the number of ambulances available to provide direct support to brigade combat teams. Loss of air superiority leaves ground MEDEVAC as the only means to transport patients with en route care.

The medical company (air ambulance) provides fifteen helicopter ambulances with a single-lift capability of ninety litter patients, or 105 ambulatory patients belongs to the general support aviation battalion, division combat aviation brigade. The medical company (air ambulance) executes its patient evacuation mission from the point of injury or Roles 1 and 2 to

[73] US Army Directorate of Force Management, "FMSWeb."

Role 3 medical treatment facilities.[74] The medical company (air ambulance) basis of allocation is one per general support aviation battalion, with twenty-six in the current army inventory.[75]

In current doctrine, the Secretary of Defense determines the theater evacuation policy based on the recommendation of the combatant commander and advice of the Joint Chiefs of Staff. The policy establishes the maximum number of days a casualty may be hospitalized and convalesce in the area of operations before returning to duty or inter-theater evacuation. Once a treating physician determines that a patient cannot return to duty within the evacuation policy, the patient moves out of the theater as soon as possible.[76] The combatant commander's recommendation to the Secretary of Defense can vary and depends upon the operational environment and tactical situation. Inadequate bed space necessitates a shorter theater evacuation policy to make beds available. It reduces the number of patients able to recover in theater and return to duty to maintain combat power. II Corps adjusted the evacuation policy to the communications zone in Tunisia to quickly clear beds and maintain patient throughput. Combat power decreased because patients that may have rehabilitated in theater and returned to duty evacuated to the communications zone due to the lowered evacuation policy.

[74] US Department of the Army, *Army Health System Doctrine and Smart Book* (Washington, DC: Government Printing Office, 2019), 124.

[75] US Army Directorate of Force Management, "FMSWeb."

[76] US Army, FM 4-02, 8-1.

Analysis and Conclusion

Analysis

The II Corps AHS provided health service support to 90,000 soldiers, admitted 19,688 casualties to corps hospitals in the combat zone, and evacuated 13,911 to the communications zone for further care. II Corps had a mobile hospital capability of 1,900 beds in the combat zone and 7,400 fixed hospital beds in the communications zone. A corps today, including four divisions and enablers, totals approximately 30,000-50,000 soldiers.[77] Casualty estimates used for LSCO planning average 1,000 casualties per division, per day.[78] Thirty-five patients admitted per day result in expected bed occupancy at thirty days of 1,805 patients. To support this bed occupancy workload, the area of operations requires a Role 3 capability of 2,640 beds. II Corps daily hospital admissions was four times higher than the planning factor of thirty-five per day.

The strength of II Corps in the Tunisia Campaign was approximately twice that of a corps today. Between 1 January and 16 March 1943, the II Corps AHS admitted 4,689 patients, an average of 146 hospital admissions per day. The patient load for thirty-five admissions per day requires 64 percent of the operating force globally available in the fiscal year 2022. The AHS today cannot support adequate Role 3 hospitalization for the estimated 1,000 casualties for four divisions simultaneously. Inadequate bed capacity leads to prolonged field care and the overwhelming of medical treatment capabilities at the Role 1 and Role 2. Prolonged field care does not commensurate with maneuver on the battlefield. This will result in an increase in the rate of death from wounds.

The individual capability of the surgical hospitals of WWII permitted leapfrogging of hospitalization units and increased hospital mobility. Today's hospital augmentation detachments

[77] US Army Directorate of Force Management, "FMSWeb."

[78] Seana M. Jardin, "Corps Level Human Resources Operations – A Team of Teams Approach to Large Scale Combat Operations." Accessed February 9, 2020. https://www.agcra.com/corps-level-human-resources-operations-a-team-of-teams-approach-to-large-scale-combat-operations/.

cannot operate independently of the field hospital and do not have organic transportation assets. These constraints in the interest of the modular structure degrade mobility and flexibility and thus decrease the field hospital's capability to operate in a LSCO environment.

The WWII surgical hospital's robust organic transportation assets allowed them to move independently of corps-level transportation and leapfrog units to maintain patient care. The 750-bed evacuation hospitals had no organic vehicles, and their inability to self-move led to lines of communication over 100 miles between clearing stations and the hospital. Today's field hospital is 35 percent mobile, and the vehicles reside in the HHD, hospital center. A hospital center that employs two field hospitals plus hospital augmentation detachments faces significant transportation challenges and cannot echelon hospitals with organic assets alone.

Difficult terrain and long lines of communication in the Tunisia campaign led to challenges in MEDEVAC. The II Corps chain of evacuation started at forward evacuation hospitals by ground ambulance and rail to fixed hospitals in the communications zone. Evacuation by air went directly to fixed hospitals. II Corps utilized tactical vehicles extensively for CASEVAC to overcome the difficult terrain and the inadequate number of ground ambulances to handle the high number of casualties. Long lines of communication often exceeding 100 miles necessitated the augmentation of ground MEDEVAC with the tactical vehicles.

Air MEDEVAC today prioritizes urgent casualties and can collect from the point of injury or at any level of care to transport to a forward resuscitation surgical team (FRST) or Role 3 hospital. Routine or priority casualties move via ground MEDEVAC when conditions do not permit flying. In an environment of challenged air superiority, urgent casualties will move via ground, thus a heavier reliance and workload for ground MEDEVAC and CASEVAC capabilities. II Corps lowered the evacuation policy to the communications zone, resulting in patients that may have rehabilitated in theater and returned to duty were evacuated out of the theater. The lower returned to duty rate reduced combat power.

Between 1 January and 15 May 1943, II Corps evacuated 13,911 casualties to the communications zone, of which ambulances and tactical vehicles evacuated 9,110 by road, 1,488 by rail, and 3,313 by air. Evacuating 10,598 casualties by ground today, the same number evacuated by II Corps via ground and rail requires one medical company (ground ambulance) to execute fifty-six to 111 turns, dependent upon patient disposition. Evacuating 3,313 casualties by air today requires one medical company (air ambulance) to execute thirty-two to thirty-seven turns. Terrain, distance, weather, and enemy situation play a factor in how frequently the ambulances can complete turns between levels of care. Loss of air superiority constrains the availability of air MEDEVAC and relies more heavily on ground MEDEVAC.

Conclusion

The limited contingency operations of Iraq and Afghanistan during the last two decades feature a robust sustainment infrastructure and nearly pervasive, uncontested medical treatment and evacuation. The Army is now confronting the challenge of how to provide and sustain combat power in the remote and contested environments of LSCO. The II Corps experience in the Tunisia Campaign offers opportunities to improve the AHS to support hospitalization and evacuation of casualties in LSCO.

The independently capable and self-transportable mobile surgical unit and hospitalization units of the WWII surgical hospitals were essential to support the fluid and non-pervasive operational environment. Similar capabilities will again prove critical in a future LSCO. The table of organization and equipment of the contemporary field hospital requires updating to reflect transportation assets organic to the field hospital, rather than the headquarters and headquarters detachment (HHD), hospital center. Transportation assets organic to the field hospital negate the problem of the HHD, hospital center sharing assets between two field hospitals, and the time-distance factor when both field hospitals do not collocate with the HHD, hospital center. Increasing the field hospital's mobility above the current 35 percent allows for the field hospital

to establish full operating capacity in a shorter amount of time. Increasing organic transportation assets and the ability for hospitals to self-transport personnel and equipment together rather than rely on outside transportation assets and compete for the priority of movement alleviates the equipment challenge experienced by II Corps in the Tunisia Campaign. This is essential for timely movement and establishment of hospital operations and patient care.

The medical company (ground ambulance) basis of allocation in doctrine requires updating. Considering an estimated one thousand casualties per division per day in an operating environment that does not guarantee air superiority, the current 0.33 companies per brigade combat team, 0.5 per division headquarters, and two per senior Army headquarters are grossly inadequate. Division headquarters should be allocated additional medical companies (ground ambulance) to task organize to its subordinate brigades as the concept of the operation requires. The current basis of allocation provides ground MEDEVAC assets for 144 litter and 288 ambulatory patients in a single lift for a division expected to receive 1,000 casualties per day. Changing the basis of allocation increases the redundancy of MEDEVAC capability when air MEDEVAC is not an option and provides the en route care that CASEVAC does not.

II Corps' deviation from the theater evacuation policy dictated by Field Manual 8-55, based on the hospitals' bed status and casualty rates, maintained movement of casualties to the rear and sustained the capability to receive new patients. In LSCO, the Combatant Commander's recommendation to the Secretary of Defense for the theater evacuation policy must change as the operational environment, and tactical situation changes. Tailoring the evacuation policy balances patient throughput and the number of casualties able to recover in theater and return to duty to maintain combat power.

Training opportunities in which hospital centers and field hospitals exercise with divisions is vital to create relationships and shared understanding of coordination for health service support with corps-level medical assets. Currently, training exercises for field hospitals are executed independently of divisions and brigade combat teams. The Army can achieve

concurrent training through combat training center rotations and Warfighter Exercises in which field hospitals, ground medical evacuation companies, and air medical evacuation companies serve as training audiences along with corps headquarters, division headquarters, and brigade combat teams. Training objectives for the field hospitals and MEDEVAC companies would nest with the training objectives of the corps and division to create realistic LSCO training scenarios resulting in shared understanding and muscle memory in coordinating and providing health service support by the field hospital. The shared, realistic training scenarios will identify additional potential problems to mitigate before a LSCO conflict with a peer or near-peer adversary. These training opportunities already exist for division and brigade combat teams as training audiences. Incorporation of the field hospitals and medical companies as training audiences supports the army in fielding capable forces to maintain combat power and defeat its enemies in LSCO.

The II Corps experience in the Tunisia Campaign demonstrates the critical requirement of organic transportation assets for timely arrival of equipment and personnel, and independent mobility to relocate the hospital. Sustaining combat power and patient survivability in LSCO requires large-capacity hospital beds to prevent overwhelming the medical treatment facilities with mass casualties and support rehabilitation in theater to return to duty. Divisions today can hold for seventy-two hours and require the capability to evacuate patients to Role 3 to maintain patient care of incoming casualties and support the concept of maneuver. Redundancy in evacuation capabilities is essential in LSCO when air or ground superiority is challenged.

The increased lethality of LSCO results in an increased probability of casualties and places an incredible burden on medical resources due to the magnitude of the forces involved. Hospital and evacuation capabilities necessitate the capability to support thousands of casualties daily. Changing the current organizational structure to include increased organic transportation assets, updating the basis of allocation in doctrine, maintaining a flexible theater evacuation policy, and creating shared training opportunities provides the AHS opportunities to sustain

combat power in large- scale combat operations. Without the evolution of the current AHS, the Department of Defense will not retain overmatch of combat power to win in an operational environment without assured dominance.

Appendix

Role 1 military treatment facilities (MTFs) provided by the medical platoon conduct immediate lifesaving measures, advanced trauma management, and collection of casualties from the point of injury or supported units. The medical platoon resides in each maneuver and fires battalion in the brigade combat team.

Role 2 MTFs provided by the brigade support medical company conduct immediate lifesaving measures, advanced trauma management, auxiliary medical services, and can hold twenty patients for up to seventy-two hours. The brigade support medical company resides in the brigade combat team. The evacuation platoon executes ground MEDEVAC within the brigade area of operations. The medical company (area support) is assigned to the multifunctional medical battalion within the medical brigade (support). It provides the same capability of the brigade support medical company on an area support basis, with the exception that it provides patient hold for forty patients for up to seventy-two hours.

Role 3 MTFs provided by the field hospital administer care to all categories of patients, including resuscitation, initial wound surgery, damage control surgery, and postoperative treatment. The HHD, hospital center executes command and control of the field hospital. The modular and scalable force structure provides the commander options depending on the operational environment and population at risk. The HHD, hospital center, and field hospital (thirty-two-beds) comprise the core and lowest denominator of the hospital center and reside in the medical brigade (support). The HHD, hospital center can command and control up to two field hospitals (thirty-two-beds) with hospital augmentation detachments, totaling up to a 240-bed hospital configuration. Augmentation detachments include the hospital augmentation detachment (medical thirty-two-beds), hospital augmentation detachment (surgical twenty-four-beds), and hospital augmentation detachment (ICW sixty-beds).

Role 4 medical care is in Continental US-based hospitals and other safe havens.

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