HOSPITALIZATION IN SMALL-SCALE CONTINGENCY OPERATIONS

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DEREK C. COOPER, MAJ, USA
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THESIS APPROVAL PAGE

Name of Candidate: MAJ Derek C. Cooper

Thesis Title: Hospitalization in Small-Scale Contingency Operations

Approved by:

_____, Thesis Committee Chair
LTC Joyce P. Dimarco, M.A.

_____, Member
LTC Daniel J. Jones, M.B.A.

_____, Member, Consulting Faculty
COL Judith A. Bowers, Ph.D,

Accepted this 6th day of June 2003 by:

_____, Director, Graduate Degree Programs
Philip J. Brookes, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

HOSPITALIZATION IN SMALL-SCALE CONTINGENCY OPERATIONS
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This thesis examines the US Army Interim Force needs with regard to deployable hospitalization during small-scale contingency (SSC) operations and the Army Medical Department's (AMEDD) ability to adequately meet the requirements. Under the current medical reengineering (MRI) plan the AMEDD appears to be postured well for supporting major theater wars (MTW). Some will argue that if an MRI structure can support the worst-case scenario--two nearly simultaneous MTWs--then clearly it could adequately support a number of SSCs. In analyzing this argument, this thesis focuses primarily on the characteristics and capabilities that echelon-III hospital units need in order to deploy and support SSCs under present and emerging conditions.

The study analyzes relevant doctrine, historical examples, and future concepts and selects the most critical characteristics required of an echelon-III hospital to be relevant in support of SSC operations. The study then evaluates four different hospital platforms and their ability to meet the desired goals of the critical characteristics. Finally, based on the assessment, the study provides recommendations for the Army's development of echelon-III hospitals in the future.

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ACRONYMS

ACC	Air Combat Command
AFTH	Air Force Theater Hospital
AMEDD	Army Medical Department
APOD	Aerial Port of Debarkation
ARTEP	Army Training and Evaluation Program
CASCOM	Combined Arms Support Command
CHS	Combat Health Support
CONOPS	Concept of Operations
CONUS	Continental United States
CSH	Combat Support Hospital
CSS	Combat Service Support
DEPMEDS	Deployable Medical Systems
DS/DS	Desert Shield/Desert Storm
EAC	Echelon Above Corps
EMEDS	Expeditionary Medical Support
ERMC	European Regional Medical Command
FM	Field Manual
FST	Forward Surgical Team
GAO	General Accounting Office
HHD	Headquarters and Headquarters Detachment
HSS	Health Service Support
HUSF	Hospital Unit Surgical, Forward
HUSM	Hospital Unit Surgical, Main

ICU	Intensive Care Bed
ICW	Intermediate Care Ward
JHSS	Joint Health Service Support
JP	Joint Publication
JV	Joint Vision
LSTAT	Life Support for Trauma and Transport
MASH	Mobile Army Surgical Hospital
MF2K	Medical Force 2000
MRI	Medical Reengineering Initiative
MSRP	Medical Readiness Strategic Plan
MTOE	Modified Table of Organization and Equipment
MTP	Mission Training Plan
MTW	Major Theater War
NMS	National Military Strategy
OF	Objective Force
OOTW	Operations Other Than War
OR	Operating Room
POD	Port of Debarkation
POE	Port of Embarkation
SOP	Standard Operating Procedure
SSC	Small-Scale Contingency
STX	Situational Training Exercise
TF	Task Force
TOE	Table of Organization and Equipment
TRADOC	Training and Doctrine Command

US	United States
USAFMSA	United States Army Force Management Support Activity
USNS	United States Naval Ship
UTC	Unit Type Code

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CHAPTER 1

INTRODUCTION

The United States Army has embarked on a very ambitious and aggressive plan to transform itself over the next twenty to twenty-five years to what is being called the Objective Force (OF). OF units will be capable of operating across the full spectrum of military operations and will be distinguishable from today's units by being more strategically responsive, deployable, agile, versatile, lethal, survivable, and sustainable (White Paper 2001d, iv). “The Army goal is to deploy a brigade combat team anywhere in the world in 96 hours after liftoff, a division on the ground in 120 hours, and five divisions in theater in 30 days” all capable of fighting immediately upon arrival (White Paper 2001d, 9). Although OF technologies and structures are not expected to materialize for the next ten to fifteen years, OF characteristics and concepts are driving operational requirements today. The Chief of Staff of the Army General Eric Shinseki has emphasized the need for the Army to develop interim solutions in order to remain “relevant” and capable of providing the right forces in a timely manner for military operations now and in the future. This emphasis is evident in many facets of the Army today: doctrinal manuals, organizational structures (Stryker Brigade Combat Teams), and equipment (interim fighting vehicle).

The Army Medical Department (AMEDD) too has recognized the requirement to transform in order to remain relevant and capable of supporting full-spectrum operations. Consequently, today the AMEDD is investing nearly all of its force management assets on OF requirements. However, it was eight years ago--before the Army released OF concepts and was still focused on Army After Next concepts--that the AMEDD

developed the Medical Reengineering Initiative (MRI) that has evolved into the solution for providing support to the Interim Force. One of the most significant factors of the MRI plan is the change to deployable hospitals. In general terms, MRI will reorganize all echelon-III and IV deployable hospitals to a 248-bed Combat Support Hospital (CSH) structure. Mobile Army Surgical Hospitals (MASHs), Field Hospitals, and General Hospitals will be eliminated from the force mix under the MRI plan. In the last three years many units have converted under MRI; the remainder of the conversions, to include all but one hospital, is scheduled to occur over the next seven to eight years. Upon completion of the MRI conversions the AMEDD will have thirty-seven CSHs, twelve in the Active Army (COMPO 1) and twenty-five in the Army Reserve (COMPO 3). The MRI hospitals will be organized in two variants: Corps CSH and echelon above corps (EAC) CSH. Both are very similar 248-bed facilities, but the Corps MRI CSH is designed, doctrinally, to have a 44-bed slice that is 100 percent mobile with organic assets (FM 4-02.10 2000b).

At issue is whether or not the MRI CSH--the only echelon-III deployable hospital platform--will be relevant and capable of supporting Interim Force operations where a full 248-bed hospital is not required. This question must be viewed in light of today's deployment and employment conditions, considerations, and realities. A quick review of the echelon-III support to all the US military operations since Desert Shield/Desert Storm (DS/DS) reveals that no complete CSH has deployed for any of the smaller scale contingency (SSC) operations during that time. When a CSH unit has received a mission to deploy and provide echelon-III support, it has spent weeks or months developing a viable task organization that ultimately resulted in the deployment of only a slice of the

hospital's organic assets. When considering recent history and the present constraints, requirements, and employment considerations, a logical question is whether the AMEDD's MRI hospitalization plan establishes a viable force mix for supporting the Interim Force in SSC operations.

Research Question

The primary research question is: Does the United States Army Interim Force need a strategically deployable, 100 percent mobile hospital that is smaller than the 248-bed combat support hospital to provide echelon-III combat health support for military operations short of a major theater war?

Four secondary questions are relevant to this study. Each has five subordinate questions concerning the characteristic required to support SSC operations: flexibility, deployability, mobility, full-spectrum capability, and reduced footprint/economy.

1. How well does the 248-bed MRI CSH (Corps) (TOE 08955A000) provide echelon-III CHS for SSC operations?

1a. Is the CSH flexible enough to provide echelon-III CHS for SSC operations?

1b. Is the CSH deployable enough to provide echelon-III CHS for SSC operations?

1c. Does the CSH have enough mobility to provide echelon-III CHS for SSC operations?

1d. Does the CSH have enough full-spectrum capability to provide echelon-III CHS for SSC operations?

1e. Does the CSH have an appropriately reduced footprint/ economy to provide echelon-III CHS for SSC operations?

2. How well does the 84-bed hospital company (TOE 08958A000) provide echelon-III CHS for SSC operations?

2a. Is the hospital company flexible enough to provide echelon-III CHS for SSC operations?

2b. Is the hospital company deployable enough to provide echelon-III CHS for SSC operations?

2c. Does the hospital company have enough mobility to provide echelon-III CHS for SSC operations?

2d. Does the hospital company have enough full-spectrum capability to provide echelon-III CHS for SSC operations?

2e. Does the hospital company have an appropriately reduced footprint/ economy to provide echelon-III CHS for SSC operations?

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3b. Is the MASH deployable enough to provide echelon-III CHS for SSC operations?

3c. Does the MASH have enough mobility to provide echelon-III CHS for SSC operations?

3d. Does the MASH have enough full-spectrum capability to provide echelon-III CHS for SSC operations?

3e. Does the MASH have an appropriately reduced footprint/ economy to provide echelon-III CHS for SSC operations?

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4a. Is the EMEDS+25 flexible enough to provide echelon-III CHS for SSC operations?

4b. Is the EMEDS+25 deployable enough to provide echelon-III CHS for SSC operations?

4c. Does the EMEDS+25 have enough mobility to provide echelon-III CHS for SSC operations?

4d. Does the EMEDS+25 have enough full-spectrum capability to provide echelon-III CHS for SSC operations?

4e. Does the EMEDS+25 have an appropriately reduced footprint/ economy to provide echelon-III CHS for SSC operations?

Context of the Problem

The medical care and evacuation system in place today still resembles the system envisioned and developed by Jonathan Letterman nearly 150 years ago. However, deployable hospital structures have evolved over the years to reflect the strategy required of the time. Today, the AMEDD's deployable hospital structure is fashioned largely on static warfare concepts blended with the requirements associated with the post-Cold War National Military Strategy (NMS) of maintaining the capability to fight two major theater wars (MTWs). For the AMEDD, static warfare and MTW are translated: large-scale war, developed over several months or years resulting in huge numbers of casualties. The CHS emphasis, therefore, is one of treatment, hospitalization, rehabilitation of patients in theater, and return to duty as far forward as possible. Consequently, deployable Army

hospitals of the 1990s range in size from 1,000-bed general hospitals through 504-bed field hospitals and 296-bed CSHs to 60-bed MASHs.

In 1994, the AMEDD took lessons learned from DS/DS and developed the MRI plan to strengthen its ability to support two MTWs. Arguably the MRI establishes a viable hospitalization structure for supporting a two MTW NMS. However, recent history shows national strategy shifting toward that of global engagement (White House 1998). For the Army, global engagement has resulted in frequent SSC deployments. Recent history is likely a good predictor of the environment the Army and AMEDD can expect to operate in during the foreseeable future. This change in strategy and environment is not a surprise or a secret that has been kept from the AMEDD. In fact, as a result of changes, the AMEDD has focused much of its attention and resources today toward developing OF capabilities for the future. In the AMEDD's effort to support the Interim Force it is relying largely on the MRI plan developed over eight years ago with two MTW conditions as the planning baseline.

The AMEDD modified the original MRI plan in an attempt to address the dynamic operational framework of an Army now focused on force projection, full-spectrum operations. A close look at MRI reveals two unit types emerging in terms of battlefield surgical support and hospitalization. The intent, of course, is for these two unit types to support the full-spectrum of possible operations. For hospitalization the primary change from the Cold War era is that all small (MASH) and all large (general and field) hospitals are eliminated. The only hospital structure that will remain in the inventory is a 248-bed CSH. The second unit to emerge is the echelon-II Forward Surgical Team (FST). An FST is not an echelon-III facility for multiple reasons: it is not self-supporting, it has

no holding capability, and it does not provide full echelon-III medical services (pharmacy, radiology, lab, nutrition care, etc.). However, it is doctrinally 100 percent mobile with organic assets and can operate in relatively close proximity to front line troops. Although with only twenty personnel authorized--all medical and surgical focused--and no holding capability, it cannot function alone or serve as the hospitalization support in a theater of operation (FM 8-10-25 1997a). Remarkably, under the MRI plan there is no unit structure between the 248-bed CSH and the FST with regard to surgical capability and/or hospitalization. This medical force distribution may provide the best support and be the most logical in terms of supporting a forward-deployed Cold War or MTW focused Army. However, recent history shows that the AMEDD will be employed and required to support full-spectrum operations well before OF capabilities are fielded.

In 1999 General Shinseki told the Army it would transform. He indicated that the new force would no longer be a forward-deployed, static warfare focused Army. His intent was clear and he has continued to work toward setting conditions for the Army to reach the OF as rapidly as possible. However, he realizes the Army cannot transform overnight. At a conference in 2000 he said, “The legacy force, that magnificent Army we see busily deployed abroad today, will remain the force of choice should this Nation go to war anytime in the next 15 years.” Though the Army does not expect to field the first OF units for another eight to ten years, it is making interim changes today in order to become more strategically responsive, deployable, agile, versatile, lethal, survivable, and sustainable. The Army is converting several units (Stryker Brigade Combat Teams) today that partially employ these seven characteristics in order to better position the Interim

Force and provide the capability to rapidly conduct full-spectrum operations. The AMEDD's reliance, however, upon the MRI plan and resulting organization structure for echelon-III hospital units may need further review and modification to adequately address the Interim Force requirements. “While The Army [and AMEDD] must remain optimized for major theater war, it must be sufficiently versatile and agile to handle smaller-scale contingencies which will occur more often, presenting unique challenges” (White Paper 2001d, 3). Certainly new technologies, doctrinal solutions, and organizational developments discovered from additional research aimed at OF capabilities will result in viable long-term solutions for the AMEDD. Until those discoveries are available and affordable, the AMEDD must ensure it is adequately postured to provide echelon-III support to an Army that is today conducting and preparing for full-spectrum operations, to include SSCs.

This thesis examines the Army's Interim Force needs with regard to deployable hospitalization and the AMEDD's ability to adequately meet the requirements. Currently, the MRI plan appears to posture the AMEDD well for supporting an MTW or two. Some will argue that if a MRI structure can support the worst-case scenario--two nearly simultaneous MTWs--then clearly it could adequately support a number of SSCs. In an attempt to analyze this argument, this thesis focuses primarily on the characteristics and capabilities that echelon-III hospital units need in order to deploy and support SSCs under present and emerging conditions.

Assumptions

Several assumptions are necessary and appropriate in order to address the questions of this research project. These assumptions are based primarily on realities

within the Army and AMEDD with regard to short-term financial constraints, personnel constraints and the length of time necessary to effect force modernization or even minor adjustments. First, near-term adjustment to the physical size or structure of the Army's deployable hospitals will still require the use of the same type of tents, containers and vehicles used today in the AMEDD's Deployable Medical Systems (DEPMEDS). It is appropriate that the AMEDD's investments with regard to time and research money be primarily focused on OF capabilities, technology, and structures. Consequently, the Army's echelon-III deployable hospital structure will likely center around DEPMEDS for the next decade or two. Second, the current number of medical personnel authorizations can be justified without necessarily having the same deployable hospital force structure planned under MRI. In other words, it is assumed that medical personnel authorizations are not tied directly to the requirements or authorizations of field units. Third, the quality of medical care provided in a MRI CSH can also be provided in a smaller (fewer beds) deployable hospital. Given that the medical personnel staffing either organization would be the same people, then the level of care should remain constant and not dependent of the number of beds in the structure. This assumption provides that the equipment in a MRI CSH would be available in a smaller facility in a quantity proportional to the facility size or to the types of patient the facility is designed to service. Last, the type of casualties expected on the battlefield in the future will remain relatively consistent with those experienced in the past. This assumption appears consistent with assumptions the AMEDD must have made when developing the MRI.

Key Terms

For the purposes of this research and in order to facilitate common understanding, it is necessary to define several terms that often carry different meanings depending on the context in which they are used. The terms defined here and used throughout the study remain consistent with the definition provided unless specifically noted otherwise.

Echelon-III. The term echelon of care is often used interchangeably with level of care. Echelon-III is characterized by medical care typically provided in a deployable hospital, regardless of the size. In the US Army, echelon-III is the first place on the battlefield where general and specialized medical and surgical care; long term and critical care patient holding capability; and pharmacy, clinical laboratory, radiology, and nutrition care services are located in one unit (FM 4-02.10 2000b,1-4).

Full-Spectrum Operations. Full-spectrum operations as defined by FM 3-0 "are the range of operations Army forces conduct in war and military operations other than war (MOOTW)" (2001b, 1-4). Providing CHS for full-spectrum operations means possessing a unit or combination of units capable of supporting missions ranging from a MTW through peacekeeping and peacemaking operations to support in domestic disaster relief operations. It includes providing support in the Continental United States (CONUS) or abroad to military or civilians alike.

Interim Force. The interim force is the Army's transitional force structure between the Legacy Force and the OF. It represents a mix of units equipped with Legacy systems, interim systems, and OF systems (Steele 2001). More importantly, for this research, it represents the time period between now and the next fifteen to twenty years.

Medical Reengineering Initiative (MRI). MRI as defined on MRI homepage is the "redesign process for converting the entire Combat Health System force in order to provide adequate support to Army Force XXI and to meet the medical care provisions outlined in Joint Vision 2010" (2002, 1). MRI is a reorganization of all field units in the AMEDD inventory.

MRI CSH. In general terms, when MRI CSH is used within text, it is referring to the AMEDD's 248-bed, echelon-III, deployable hospital. Many Medical Force 2000 and earlier CSHs were 296-bed or larger facilities (FM 8-10-14 1994a). This research examines the plan and capabilities of the two MRI CSH variants.

Objective Force (OF). The OF is the expected Army force structure in the future (Steele 2001). What exactly the OF structure will entail is not as important to this research as is the time before it becomes a reality. Therefore, to establish a definitive time line for this research, the OF is considered the Army's force structure after year 2020.

Recent History. For this research, recent history is defined as the time period following DS/DS through the present--fall 2002. This phrase is used primarily when referring to US Army military operations that occurred during this time period.

Small-Scale Contingency (SSC). For the purposes of this research, a SSC is any military operation short of MTW.

Limitations

This research is limited by several factors. First, the AMEDD has shifted most of its resources toward the investigation and discussion OF capabilities, technologies, and structure. Therefore, much of the materiel available for analyzing the question posed by this research is either dated, derived from lessons learned (or opinions) of various

secondary sources, or from subjective comparisons instead of statistical analysis. Secondly, time, financial resources, and the investigator's experience significantly limits the breath and depth of research conducted, the ability to conduct experiments, and the feasibility of conducting complete statistical analysis. Lastly, the research is constrained by the subjective nature of the research model and its use of the author's judgment when comparing various hospital structures (the subjects) against the evaluation criteria.

Delimitations

This study is focused on hospitalization requirements to support operations short of a MTW. It focuses specifically on providing echelon-III hospitalization capabilities in SSC. Though other medical functions' capabilities, requirements, shortfalls, technologies, and joint aspects are referenced and discussed as enablers for echelon-III CHS, this study does not analyze the other medical functions' requirements for supporting the current force and Interim Force. Further, this study does not attempt to develop a new deployable hospital structure. It does not attempt to conduct a complete technology review or to suggest a new philosophy for providing CHS. However, there may be new technological advances today that the AMEDD is working on or procuring that could directly impact on the size of a deployable hospital. Therefore, it is appropriate to briefly review the relevant medical and non medical technology that may support the research of this study. Where practical, this study addresses shortfalls and makes general recommendations to provide the AMEDD force management elements a focus and potential starting point to work issues. Additionally, this study does not address the impact (if any) of a change to the structure of deployable hospitals on the AMEDD's overall medical personnel requirements and or authorizations. Further, it is beyond the scope of this study to

analyze the methodology that the AMEDD applies to determine the facility size (number of beds) needed to support a particular SSC. In general, factors such as casualty estimates and joint or coalition medical support are considered by planners when developing a package to support a SSC; these factors are not necessarily significant in developing the structural size of deployable hospitals in general. Lastly, the end of January 2003 was established as the cutoff date for collecting materiel relevant to this thesis.

Significance of the Study

The significance of this topic should be apparent. Because “soldiers remain the centerpiece of our formations”(FM 1 2001a, 35), the inseparable relationship between echelon-III hospitalization and the ability of the AMEDD to provide world-class health care on the battlefield cannot be understated. AMEDD leaders indicate, “MRI is the AMEDD's Interim Force” (AMEDD 2002a). If held to schedule, all echelon-III deployable hospitals will be converted to the 248-bed CSH by 2008. Taking the 2008 end-state together with budget and force development time lines, the AMEDD is committed for the next twelve to fifteen years without a deployable hospital smaller than 248 beds. However, AMEDD leaders may not fully appreciate the significance and extensive nature of the changing conditions and environment requiring support. Given that the AMEDD's Director of Combat and Doctrine Development (DCDD) has changed its focus to OF issues and that it is unlikely that OF structures will materialize for at least another fifteen years, it is important now to determine if MRI plans leave unsatisfied hospitalization requirements. If capability shortfalls exist, then it is imperative to make timely, low cost adjustments where possible or at least recognize the risks and plan accordingly. By the Army being more responsive, agile, deployable, and shrinking its

“logistics footprint” on the battlefield, it directly impacts the AMEDD and its ability to deploy and then provide world-class CHS. Certainly, the world will not wait and remain without conflict or disaster until the AMEDD can transform to OF structures. Therefore, this study attempts to address the significant question of whether the US Army's Interim Force needs a strategically deployable, 100 percent mobile hospital that is smaller than the 248-bed CSH to provide echelon-III CHS for military operations short of a MTW.

CHAPTER 2

LITERATURE REVIEW

American civilian and military leadership is not just planning to develop a military instrument of power capable of conducting full-spectrum operations in the future. Rather, it demands and expects today's US armed forces to be strategically responsive and dominant now at every point along the spectrum of conflict (Joint Vision 2010 1996). Figure 1 represents the type of operations encompassed by the term “full-spectrum operations.” The majority of the operations depicted on figure 1 and all of the operations that the US Army has conducted in that last ten years are generally classified as small-scale contingency (SSC) operations (FM 3-0 2001b). In conducting SSCs the Army has deployed between a few hundred soldiers (East Timor and Rwanda) to several thousand soldiers (Haiti, Bosnia, and Kosovo). All of these SSCs required some level of echelon-III hospitalization support.

Figure 1. Spectrum of Military Operations

Source: Command and General Staff College, C500 - Fundamentals of Operational Warfighting course material, Course Author John N. Cary (2002)

To design hospital structures to adequately respond to the multitude of SSCs expected in the future, one could assume that the optimal size of an echelon-III hospital is in some way proportional to the number of soldiers deployed for the specific operation. That assumption would lead one to conclude that the AMEDD, in order to support the full-spectrum of operations, needs several different sized hospitals. However, “think tanks” like RAND (Davis et al. 1996) and the Center for Strategic and International Studies (Macgregor 1997) contend that developing units around specific SSCs is ill advised. Among other factors, possessing several variants of functionally similar organizations become impractical to maintain for reasons such as cost, training, and maintenance.

Another view, the AMEDD's (2002a) prevailing view, of the optimal hospital structure is that of a single, large hospital structure that can be “tailored” or “task organized” to meet the requirements of any specific operation. This technique may work but the obvious issue is then whether or not tailoring provides the flexibility to meet the deployment constraints present today.

This thesis examines the US Army Interim Force field hospitalization requirements in SSCs and the AMEDD's ability to adequately fulfill the requirements under present and emerging conditions. The primary research question asked is: Does the US Army Interim Force need a strategically deployable, 100 percent mobile hospital that is smaller than the 248-bed CSH to provide echelon-III CHS for military operations short of a MTW? In examining this question the literature review comprehensively summarizes exiting literature with regard to general lessons learned, tenets, and doctrine and explores

the characteristics and capabilities required to provide echelon-III CHS under present and emerging conditions. In doing so, it examines the following five areas:

1. What type of military operations will the AMEDD be expected to support with echelon-III hospitalization?

2. What factors influence an echelon-III hospital's strategic deployability?

3. What factors influence an echelon-III hospital's mobility?

4. What factors influence the nature of support that an echelon-III hospital is required/expected to provide?

5. What are the capabilities of the MRI echelon-III hospital and surgical units?

Lastly, it considers what changes (if any) can be made now with existing resources that would enable the AMEDD to meet short term obligations and remain a relevant, combat multiplier for the Interim Force.

General Lessons Learned, Tenets, and Doctrine

Casualties will occur in future wars and SSCs. American military operations in recent history have not received a lot of national press coverage. Generally, as troops deploy, there is a “debate” in the media, but within a few days or weeks interest wanes and there is little in the way of lasting coverage. For example, one would be hard pressed to remember when operations in Bosnia or Kosovo last made the front page of a newspaper. This phenomenon in general is due to the lack of fatalities that occur in SSCs. Military planners and force developers would like to keep it that way by developing technologies that enable operations to be conducted at greater standoff distances and by remote means. However, the literature reviewed indicates that “the essence of war will remain the same. There will be casualties, carnage, and death; it will not be like a video

game" (US Commission on National Security 1999, 6). Further, Charles Dunlap in his article, "21st-Century Land Warfare: Four Dangerous Myths" (1997), refutes the myth that modern technology will make war bloodless. He concludes, as did Brigadier General Rupert Smith, "The only certain result of your battle plan will be casualties--mainly the enemy's if it's a good plan, your's (sic) if it's not. Either way, foremost in your supporting plans must be your medical plan" (Henthorne 1998, 39).

The Army can expect to conduct SSC operations in the future. There is an abundance of complementary literature that indicates the probability of future SSCs for the Army is high. Every national or military strategy document; to include the 2002 *National Security Strategy*, 2002 *National Military Strategy*, 2001 *Quadrennial Defense Review*, *Joint Vision 2010*, the *Army Vision*, joint publications, and Army field manuals; indicate that the Army must not only prepare for the worst case scenario but must also prepare to conduct SSC operations. Futuristic works, such as *The Coming Anarchy* (Kaplan 2000), *War and Anti-War* (Toffler and Toffler 1993), and *The Clash of Civilizations and the Remaking of World Order* (Huntington 1997) describe a future where technology, environmental scarcity, terrorism, globalism, and other factors jeopardize US interests that can ultimately lead to a proliferation of SSCs operations. Several RAND studies further support the notion of continued SSC requirements. The RAND study *Bettering the Balance: Large Wars and Small Contingencies* specifically states, "Neither smaller-scale contingencies nor preparation for major theater wars will disappear from the Army's agenda. Both are in the nation's interest, and the Army has no choice but to prepare itself for both" (Hosmer et al. 1997, 9).

AMEDD lessons learned in DS/DS and subsequent SSCs. It is challenging to determine the optimal hospital structure for best supporting major theater wars (MTWs) and SSCs. However, most acknowledge that the current medical force in the Army is structured to meet the worst-case wartime scenarios envisioned during the Cold War (Beaty 1997). Echelon-III care is built around a large, rigidly structured, and redundant deployable hospital system. In DS/DS the AMEDD experienced the challenges of such a system and has based much of its MRI on those lessons learned. MRI slide packages from 1999 and 2000 provide DS/DS lessons learned on a "Why Change?" slide. The lessons cited in the briefing include: (1) inability to keep up with combat forces, (2) inability to get units on the time-phased force deployment list, (3) lack of true early entry units, (4) medical sets not designed for stability and support operations, and (5) AMEDD command and control inadequate for 24 hour and split-based operations (AMEDD 1999, slide 3). Interestingly, with the addition of "reduce theater medical footprint," these lessons are generally the same factors indicated in the 2002 briefing that outlines how MRI supports Army Transformation (AMEDD 2002a).

AMEDD lessons learned did not end with DS/DS. SSC operations of the last decade have also resulted in a collection of lessons learned. The AMEDD Lessons Learned web page has hundreds of lessons from nearly every deployment AMEDD forces have participated in since Operation Just Cause in 1989. A paragraph from an article titled, "The Contingency Medical Force: Chronic Challenge, New Solution" captures the essence of many of the AMEDD's SSC lessons learned. It says,

> For short-notice or no-notice contingency operations, the Army must rapidly deploy brigade-size, tailored task forces (TFs) to austere locations under ambiguous conditions. In such situations, the forward surgical team lacks the

> requisite capabilities and the CSH (even the 86-bed 100 percent mobile module) does not have the desired deployability. (Moloff 2001, 199)

Three other lessons learned (or trends) appear to be indicative of recent operations and/or literature describing future operations. First, the military expects to conduct future operations rapidly, in a brief period of time, and often involving very lethal engagements (JV 2010 1996). Second, recent history, future concepts, and the *Joint Health Service Support (JHSS) Vision 2010* (1997) indicate that theater hospitalization will not likely provide definitive care in theater. Rather, hospitals in theater will provide only the "essential care" necessary to stabilize patients for evacuation out of theater. This lesson (trend) seems to support the requirement to minimize the medical footprint in theater. Lastly, theater evacuation policies in SSCs have all been seven days or less since DS/DS. These lessons combined with the DS/DS lessons were certainly relevant factors for the Department of Defense when it drafted the latest version of the *Medical Readiness Strategic Plan* (MRSP). The MRSP directs the services to develop lighter, more mobile, and strategically deployable medical forces capable of "sustained medical support for any mission within the operational spectrum" (1998, 24).

Tenets and doctrine for the Interim Force. The most common theme in nearly all current literature is Objective Force (OF) focused. The tenets and principles for the OF were clearly articulated in the OF white paper released in 2001: responsive, deployable, agile, versatile, lethal, survivable, and sustainable. Although much of the ability to truly achieve these tenets rests on acquiring future technologies, the Army is aggressively rewriting doctrine, promoting OF concepts, and expecting its forces to move toward operating under OF tenets today, even without the technology boost. Consequently, the relevant literature with regard to hospitalization more closely resembles OF themes than

it does current force structure reality. Training and Doctrine Command (TRADOC) Pamphlets 525-50 (1996b) and 525-66 (1997c) emphasize the following tenets for CHS operations: far forward surgical care, reduced evacuation times, strategic and tactical agility, and small footprint. Specifically, TRADOC Pamphlet 525-50 says,

> CHS organizations must be small as possible, yet retain functionality . . . Personnel and equipment must be critically evaluated and drawn down to enhance hospital deployability and mobility . . . Hospital organizations will be redesigned to make them strategically deployable/mobile. (1996b, 15)

Furthermore, the General Accounting Office (GAO) echoes the TRADOC emphasis and indicate that the AMEDD should develop hospital units that are "lighter, smaller, more mobile, and adaptable to different mission requirements" (1996b, 2). The Army's *FM* 7-0 *Training The Force* (2002), also recognizes fundamental changes in the environment by acknowledging the requirement to train for SSC operations. It establishes a new "train-alert-deploy" doctrinal sequence in place of the old alert-train-deploy sequence. All sources seems to embrace the notion in Thomas Friedman's *The Lexus and the Olive Tree* (2000) that the Army is no longer operating in a Cold War environment when the "big ate the small," but rather operating in an environment where the "the fast eat the slow."

The common theme of the AMEDD literature seems to indicate full support of the emerging tenets and doctrine described above. The AMEDD's solution is MRI. All AMEDD (2002a) briefing slides, policy letters, and web sites on the topic state that MRI supports the Interim Force requirements and provides a bridge to the OF. However, some sources, particularly RAND (Davis et al. 1996), wonder if the AMEDD's structure provides the necessary capability to meet the requirements of SSCs (RAND predominately uses the term operations other than war (OOTW)). Many of the RAND studies articulate challenges that potentially suggest altering characteristics of the MRI

medical force structure. The challenge for the AMEDD today remains fielding a medical structure for the Interim Force that is flexible and agile enough to respond to operations along the entire spectrum of conflict. Certainly, waiting on OF technological solutions is not a prudent option, because as one Civil War physician said, “There is no Sunday in the Army” (Baird 1979, 317).

Characteristics and Capabilities For Present and Emerging Conditions

What type of military operations will the AMEDD be expected to support with echelon-III hospitalization? Anticipating future operations is not an exact science and results are not something that can be stated factually. However, planners must proactively attempt to analyze the situation and develop assumptions or predictions in order to continue force modernization programs. In an effort to forecast the type of operations that the AMEDD must support over the next couple of decades this thesis takes note of the predictions in current literature, but also largely weighs recent historical operations as indicative of future operations. As pointed out earlier, virtually all sources agree that SSCs are likely to be prevalent in the future. In general, the literature indicates that medical units must remain as flexible, responsive, and capable as the forces it supports. The Army will be faced with committing forces in potentially hostile environments and unlike the DS/DS scenario will not have the time or resources available to develop a large logistics infrastructure. Forces varying in size, from battalion up to corps, will conduct military operations across the full-spectrum. If planners and futurists are correct and the preceding description is a good forecast of what the future holds then, the SSC operations of recent history are good examples of what future operations will likely resemble.

The US military has conducted numerous SSC operations where an echelon-III hospital unit was part of the force package. Table 1 below provides a summary of historical statistics from several of these operations. It is not intended to be a comprehensive review of all SSC operations. However, it appears to fairly represent what current literature is describing as likely future SSC operations.

Table 1. Hospitalization Support for Small-Scale Contingencies

Operation	Location	U.S. Militray Deployed	# Echelon-III Beds	Source
Joint Task Force Andrew ('92)	Florida	22,800*	20	GAO 1993b / Carroll 1996
Provide Relief/Restore Hope ('92/'93)	Somalia	17,000	42	Stewart 1994
Provide Promise ('92-'96)	Croatia	38,000**	60	Wentz 1999
Uphold/Restore Democracy ('94/'95)	Haiti	20,000	52	Deal 1997
Implementation Force (IFOR) ('96)	Bosnia	20,000	60	Kozaryn 1997/ERMC 2003
Stabalization Force (SFOR) ('97+)	Bosnia	8,500	24-to-16	ERMC 2003***
Task Force Hawk ('98)	Albania	5,500	18	Moloff 2001
*Hospital served both military personnel and civilains affected by the hurricane				
**The U.S. hospital primarily served United Nation forces; only about 2000 of the 38,000 troops were U.S.				
***European Regional Medical Commanc				

Note: The number of US military deployed column represents US Army soldiers or personnel supported by the Army medical facility, rounded off at its peak (except where annotated by asterisks).

Humanitarian assistance and disaster relief operations by nature afford very little time for planning and preparation. Furthermore, medical personnel and units are in high demand during these operations. Deployable hospitals in the force structure today are primarily centered around trauma and emergency care capabilities. An often articulated issue for echelon-III units conducting these type of operations is the requirement to conduct sick-call for deployed service members and provide sick-call and physical examination services for the civilian population. These hospitals are not generally staffed and equipped appropriately to provide these services. Rumbaugh concluded, “Successful military medical support of humanitarian assistance and disaster relief operations is

contingent upon having military units properly equipped, staffed, and trained to accomplish the mission" (1998, 271).

For SSCs the MRSP indicates the medical community needs to "reduce the medical footprint in an area of operations and the consumption of critical non-medical resources such as air and sea lift" (1998, 38). With regard to hospitalization RAND concluded "the size of the hospital required for OOTW also tends to be small….Rarely do OOTW require an entire military hospital unit" (Davis et al. 1996, 94). The RAND statement was made in light of the fact that in the AMEDD's current deployable hospital force structure all but one of the hospitals are 248-beds or larger units.

What factors influence echelon-III hospital's strategic deployability? Historically force developers for support units, particularly echelon-III hospitals, have not been overly concerned with strategic deployability--or strategic mobility as often called. However, current doctrinal, force development, and opinion-based literature all indicate that strategic deployability is a complex challenge facing support units. The challenge for AMEDD units is that "Medical systems must compete with the movement of combat troops and other war-fighting material to the theater" (GAO 1996, 3). This is an age-old problem that is compounded by the Army's aim to deploy a brigade in 96 hours and a division within 120 hours. The Air Force, with the assets available today, in order to meet this time line is pushed to its capacity limits when considering just organic brigade and division element (Hickins 2002). The Navy does not possess the capability to strategically deploy forces from the CONUS to overseas locations in the time frames specified (Owen 2001). To further exacerbate the issue it is commonly believed that future adversaries will not delay their operations and afford the US military a six-month

period to build a sustainment base in theater. This reality has resulted in significant adjustment by the other services' medical components.

The other services are in some ways competing with AMEDD with regard to hospitalization support. The Air Force system generally aligns with what TRADOC Pamphlet 525-50 indicates is needed. TRADOC Pamphlet 525-50 says, “The CHS structure must be strategically and tactically agile to respond to the broad range of worldwide requirements” (1996b, 1). The Air Force system, called Expeditionary Medical Support (EMEDS), is designed on a building block methodology. It has three modules that can deploy in sequence, as needed, or all three can deploy as one unit. The basic module has a four-bed capacity, the second module increases the capacity to ten beds, and the final module increases the capacity to twenty-five beds (ACC 2002). The modules can stand alone and have a separate unit type codes (UTCs) that facilitates rapid deployment with minimum use of strategic lift assets. The EMEDS shortcoming is that once deployed it lacks any mobility and is virtually limited to operating from an airport.

The Navy is developing a system that “focuses wartime medical capability around a core unit with the capacity of 20 to 130 beds” (GAO 1996, 11). The Navy can also contribute two fully staffed and modernized hospitals in a theater of operation without using any strategic lift assets. The USNS *Mercy* and USNS *Comfort* can deploy with up to a 1,000-bed capacity and be in any theater of operation within 24 days (Department of the Navy 2002). The drawback again is its inability to move with forces inland.

There is some indication that the AMEDD recognizes the need to review its force structure from a strategic deployability aspect. In a question and answer format on the MRI web site it says, “MRI was not designed to necessarily decrease the weight and cube

of remaining MRI units" (2002). It later says, "There is a growing realization that even smaller 'building block' units can be derived from the MRI organizations, to further facilitate the deliberate planning process, and insure a tailored force to support the full-spectrum of Army operations in the 21st Century" (MRI 2002). It is evident that as operations become more joint in nature, strategic deployability concerns will require combatant commanders to carefully choose which service will provide echelon-III hospitalization for future SSCs.

What factors influence an echelon-III hospital's mobility? "To be of benefit in war, medical care has to be there. To be there it has to be mobile, not 'movable'" (Porr 1993, 13). Colonel Porr and a host of others examined challenges experienced during DS/DS and concluded that for hospitalization, "The highest priority is getting there, defined as mobility" (Steinweg 1993, 737). If mobility was important to a hospital during DS/DS, it is even more critical for a hospital in the conduct of SSC operation. As doctrine and technology enable more "reach logistics" and a "smaller logistics footprint" in theater, units--to include medical units--will have fewer transportation resources to call upon for movement support. Furthermore, the battle space for all Army formations has increased in the last several years, meaning that a given number of troops, units, or assets are responsible for larger areas on the ground (CASCOM 2002). The MRI web page acknowledges that "the existence of transportation units on the battlefield is not based on unit movements" (2002). Transportation assets are allocated to an operation based on requirements to move supplies. Even when thousands of transportation assets were deployed in the DS/DS theater, the AMEDD experienced difficulty obtaining an adequate number of transportation assets to perform the movement mission. Hospital units were

"too low on priority to get Corps support in a timely manner" (AMEDD Lessons Learned 1992b). To compound the challenges most SSC operations will only warrant the deployment of a single hospital. So as the area of operations becomes larger and fewer transportation vehicles of opportunity are available, the issue of hospital mobility will increase in importance. Planners must prevent overextending evacuation times by ensuring hospitals are moved as necessary and positioned accordingly. Joint publication 4-02 states, "Since contact with supported units must be maintained, HSS (Health Service Support) elements must have mobility comparable to that of the units they support. Mobility is measured by the extent to which a unit can move its personnel and equipment with organic transportation" (2001, II-1).

In general, the literature sited above alludes to the idea that it is unlikely and imprudent for the AMEDD to count on significant amounts of external transportation support during SSC operations. Both AMEDD (1999) and GAO (1996) indicate that deployable hospitals lack sufficient mobility. TRADOC Pamphlet 525-66 (1997c) indicates that hospitals must possess the capability to keep pace. And Arthur Smith in his article "Joint Medical Support: Are We Asleep at the Switch?" says, "The Army [hospitals] needs a considerable amount of tactical mobility since its field hospitals support advancing combat forces" (1995, 104). In general, the literature surveyed indicated that the AMEDD should strive to make hospitals "lighter, smaller, and more mobile." However, the literature did not specifically define the exact capability that an echelon-III hospital should possess with regard to mobility. It was apparent that most sources did not expect that hospitals would or could move every time maneuver forces advance. Scott Beaty, in the article "The Revolution in Military Medical Affairs,"

"acknowledges that hospitals will not follow combat formations around on the battlefield" (1997, 67). However, a common theme in the literature is that where SSC operations are concerned a hospital upon reaching the port of debarkation (POD) will have to rely heavily on its organic transportation assets if it intends on moving. Further, it should have the capability to move, under its own power, every four to five days or before evacuation lines and assets become overextended.

What factors influence the nature of support that an echelon-III hospital is required/expected to provide? Many factors influence the business of providing echelon-III medical care on the battlefield. The literature on this topic is roughly divided along three lines. In broad terms, technology, unit effectiveness, and philosophy are the three areas that have an immediate or short-term influence on the required/expected support of an echelon-III hospital.

Technology, of course, is having an enormous impact on all aspects of military. For the OF new technologies may profoundly change the way health care is provided in the future. For this thesis, only those technologies that are available today or in the very near future are considered relevant for affecting the AMEDD's Interim Force hospitalization issues. Numerous sources describe innovative pieces of equipment that if utilized can reduce the physical size of a deployable hospital. For starters, the joint health services are aggressively pursuing telemedicine (Clyburn et al. 1997). Telemedicine aims to enable certain health care functions in theater without having the specialist or equipment physically deployed. Another technology in the works for over five years is the Life Support for Trauma and Transport (LSTAT) (Blake 2000). The LSTAT is a portable intensive care unit that can travel with the patient. The services are designing it

to facilitate evacuating less stable patients (Siuru 1997). Other promising devises, in various stages of development or use, include hand-held x-rays, digital x-rays, miniature lab test devices (I-STAT), oxygen concentrators, and advanced physiologic monitors (AMEDD 2002a). These devices aim to shrink the medical footprint on the battlefield. Two additional technologies with potential to significantly impact battlefield health care in the near future include fibrin sealant bandages and blood substitutes. Early versions of fibrin sealant bandages are being used in Afghanistan. For blood substitutes the AMEDD is cooperating with industry to field a viable product in the future (AMEDD 2002b).

The intent here is not to conduct a complete analysis of new technology. However, it is enough to say that new technologies can influence the nature of support that an echelon-III hospital provides in the near future. New technologies can play a vital role in shaping hospital support in theater especially in light of philosophical changes that are occurring with regard to theater logistics and health care support.

The philosophy for US Army health care on the battlefield is not dictated by the AMEDD. The philosophical ideas that shape the nature of healthcare belong not only to the Army and AMEDD but also to the American people and the Department of Defense. The nature, extent, quality, and expectation of medical support on the battlefield have rapidly increased in the last twenty years. Perhaps today battlefield health care receives more scrutiny than ever in the past. A common theme in the Army is that, “Soldiers remain the centerpiece of our formations” (FM 1 2001a, 35). The American public demands that when soldiers are sent into battle that the Army provide world-class health care on the battlefield. This idea was actually articulated in 1942, by the Chief Surgeon for the European Theater of Operations, when he said, “Above all else . . . the American

people demand in war . . . that their soldiers be given superior [*sic*] medical service. No one thing can cause such a furor in the United States as the knowledge that adequate and proper hospital facilities are not being provided for their troops" (Cosmas 1992, 43). Though the philosophy is not new, perhaps, technological advancements in mass media have made public will a more significant factor in US military operations (Clark 2001).

Another philosophy adopted by the Army that affects AMEDD hospitalization is the idea already discussed of "reduced footprint" in theater. The idea goes hand in hand with the prevailing joint health services' philosophy to reduce theater evacuation policies and move definitive care out of theater (Department of Defense 2000). These factors, in addition to the possibility of short-notice rapid deployments, greatly influence the nature of support that an echelon-III hospital is required to provide. In a train-alert-deploy environment, where maximum capability with minimum footprint is critical, "early entry" forces must be adequately structured and ready to deploy (McNaugher et al. 2000).

Unit effectiveness is the final area reviewed as having an impact on the nature of support units, to include hospitals units, provide. Unit effectiveness is related to unit integrity and cohesion, esprit, and training. A challenge for AMEDD hospital units in recent history has been the requirement to "task organize" or "tailor" the unit for deployment. Organizational behavior books (Hellriegel 2001), the AMEDD lessons learned web site and the Army lessons learned web site, all provided numerous examples on the disrupting effects of task organizing shortly before a deployment. One lesson indicated that, "A universal problem encountered by medical units was difficulty achieving unit cohesiveness" (AMEDD Lessons Learned 1991b). *Company Command the Bottom Line* --a universally respected book among Army officers--states, "Maintain

unit integrity for every assigned task. It builds teamwork, increases cohesion, and enhances proficiency. The more soldiers work together as a team, the greater the chance for mission success" (Meyer 1996, 101). Aside from impacting unit cohesion, tailoring negatively affects training, standard operating procedures (SOPs), and load plans. Army doctrine and lessons learned emphatically encourage units to train as they fight (FM 7-0 2002). Most sources agree that future operations will afford little time for training prior to deployment. SOPs and load plans take months and sometimes years of training to develop. Much of that work can be jeopardized if units must scale down or task organize. In summary, these unit effectiveness concepts apply to all units. The literature suggest that, "Several inherent problems can arise in creating a 'new' organization for each contingency operation" (Moloff 2001, 199) and that "A single well-drilled organization is likely to fight better than a well-designed, but new team" (Holder 1988, 40).

What are the capabilities of MRI echelon-III hospital and surgical units? Today the AMEDD still has one MASH, several 296-bed CSHs, and several general, evacuation and field hospitals in the force structure. The MRI brief (AMEDD 2002a) details the AMEDD's plan over the next seven to eight years to convert all deployable hospitals in the inventory to CSHs. The plan calls for a total of thirty-seven MRI CSH hospitals at endstate. The thirty-seven hospitals will be standardized, 248-bed, DEPMEDS based hospitals, organized in two variants: echelon above corps (EAC) CSHs or Corps CSHs. Of the thirty-seven hospitals twenty-three will be Corps CSHs (eight COMP 1, fifteen COMPO 3), and fourteen will be EAC CSHs (four COMP 1, ten COMPO 3). The twenty-three Corps MRI CSHs are the only echelon-III hospital assets that will remain in the inventory. The EAC CSH is primarily considered an echelon-IV hospital and lacks

some of the capabilities of the Corps CSH. The capabilities of a Corps CSH are found in doctrinal manuals, the TOE, and MRI briefing slides. Both are composed of a 164-bed company, an 84-bed company, and a headquarters detachment.

Though not echelon-III, the FST warrants some discussion. The FST is designed to provide far-forward surgical care. It is 100 percent mobile and designed to move under its own power as the supported maneuver force advances. By TOE the FST consists of twenty personnel, six vehicles, two operating tables, and other support equipment (USAFMA 2002a). Doctrinally the FST's mission is to resuscitate and stabilize patients for evacuation; its organic capabilities enables 30 surgeries or 72 hours of consecutive operations (FM 8-10-25 1997a). The unit has no holding capability and is depends on the attached unit for food, water, fuel, security, and all other support functions.

Conclusion

In general the literature review revealed that the Army and AMEDD should anticipate conducting SSC operations in the future. These operations will likely span the spectrum of conflict and on occasion will require short notice, rapid reaction type responses. The AMEDD can expect--regardless of the type and size of operation--pressure to reduce its footprint on the battlefield while continuing to provide the same world-class health care it is known for today. Many experts disagree about how echelon-III units should be structured to best support SSCs, specifically whether or not units should be designed solely for the purpose of conducting SSC operations. Nevertheless, all seem to agree that challenges arise in supporting various SSCs even if the total structure available meets the requirements for supporting two MTWs.

CHAPTER 3

RESEARCH METHODOLOGY

This thesis examined whether the US Army needs an echelon-III hospital that is smaller, more strategically deployable, and more mobile than the 248-bed Medical Reengineering Initiative (MRI) Combat Support Hospital (CSH) for supporting the Interim Force during small-scale contingency (SSC) operations. If just one MRI CSH had been fully deployed to any of the US military SSC operations in recent history, it would have had the medical capability to satisfy all echelon-III medical requirements. Moreover, in most cases a full CSH would have exceeded the required medical capacity by four or five times. However, when taking into account the present constraints, requirements, employment considerations with regard to SSC operations it is necessary to look beyond medical capability alone. Because getting a full CSH deployed for a SSC operation under present and emerging conditions is highly unlikely.

This chapter describes the research methodology, and develops and defines the research subjects and criteria used for the analysis. Chapter 4 is devoted to the presentation, and explanation of the study findings, including an evaluation of each subject's ability to meet the stated performance criteria. Chapter 5 provides the interpretation and summarizes the study findings.

The research approach for this study was qualitative in nature. A purely quantitative approach was ruled out for several reasons. First, in that deployable medical systems (DEPMEDS) are assumed to be the primary echelon-III platform for the next ten to fifteen years, combined with the time and financial constraints of this study led to a more inductive approach to discovery. Second, very little quantitative data could be

found with regard to the echelon-III hospitalization and characteristics evaluated in this study. And finally, survey data would have been of little use because surveys are largely opinion based by nature and results would differ significantly from respondent to respondent based on experience. Moreover, if desired, the opinions could be fairly well extrapolated from the materiel gathered for the literature review.

This study focused on collecting information from various sources that do not lend themselves to empirical evaluation. To collect and analyze information for a study of this nature without attempting to design new platforms and conduct side-by-side tests required a flexible and interpretive research method. Therefore, the thesis employed a goal-based evaluation method described in *Methods of Educational & Social Science Research* (Krathwohl 1998). However, as advocated by Krathwohl (1998, 27), the study combines elements of various methods as appropriate for best answering the primary question and presenting the findings. The method developed and employed here consisted of the following five steps:

Step 1--Select criteria (performance "goals" for the echelon-III platform)
Step 2--Select subjects
Step 3--Evaluate subjects' performance of criteria
Step 4--Organize information in a comparison matrix and analyze results
Step 5--Interpret and report results

Step 1--Select criteria (performance "goals" for the echelon-III platform)

One of the primary concerns with the goal-based evaluation method is "whose version of intended goals is used" (Krathwohl 1998, 611). This thesis attempts to use a set of goals (criteria) that are representative of the characteristics considered most significant for an echelon-III hospital to support a SSC operation in light of emerging constraints. The criteria were primarily derived from the following sources: (1) principles

of Combat Health Support, (2) Combat Service Support (CSS) characteristics, (3) Field Manual 3-0 attributes of strategically responsive Army forces, (4) emerging Objective Force (OF) and Transformation characteristics, (5) training principles outlined in Field Manual 7-0, and (6) historical lessons learned from (or the opinions of) various sources. Individual criteria were selected for use in this study from the doctrinal principles, tenets, and or characteristic listed above based on their relevance in answering the primary research question. For each criterion multiple sources were considered and the definitions compared for agreement or disagreement. As such, the criteria may not be defined as they are in current doctrine. Rather, in some cases, their definitions were refined and based on current and emerging constraints and/or deployment philosophy.

Specifically, the criteria selected were based on the most critical characteristic required of an echelon-III hospital to be relevant for support to SSC operations. The definition of each criterion equates to a performance goal that should be inherent in an echelon-III hospital structure to support future SSC operations. Because the thesis focused primarily on the characteristics/capabilities that an echelon-III hospital needs in order to deploy and support SSCs under present and emerging conditions exclusive of medical care, a qualitative medical care criterion was not included. The criteria and definitions are presented below and used to evaluate the subjects listed in step 2.

Flexible. The definition of flexible as used here is derived from the CHS principle--flexibility, the CSS characteristics--responsiveness and flexibility, and the Force XXI tenet--flexibility. An echelon-III hospital needs to possess several key characteristics to fully meet the goal of flexibility. It should be structured to ensure that "no more medical resources be committed nor . . . established than are required to support

the expected patient densities" (FM 4-02.10 2000b, 1-2). It should be capable of providing "the right support in the right quantity in the right place at the right time" and capable of adapting its "structures and procedures to changing situations, missions, and concepts of operations" (JP 4-0 2000, II-2). To meet the optimal performance goal for flexibility a hospital should have a modular design capable of providing an early entry module or serving as an early entry hospital that can operate independently for long periods of time.

Deployable. An echelon-III hospital must be capable of strategically deploying at the pace of the forces it is tasked to support. In order to accomplish this goal it should be organized and structured such that it is "unburdened of significant deployment and sustainment tonnage, and must be deployable by a variety of lift platforms" (White Paper 2001d, 9). It should be structured with the capability to develop standard load plans that match a designated unit type code (UTC) for the organization. The unit should not have to develop new load plans and/or a derivative UTC in order to deploy in support of a SSC operation.

Mobile. "Mobility is measured by the extent to which a unit can move its personnel and equipment with organic transportation" (FM 4-02.10 2000b, 1-2). For this thesis, mobility is focused solely on an echelon-III hospital's organic ground transportation assets used for movement either to the port of embarkation (POE) or once the unit is physically in the theater of operation. It excludes strategic (overseas) movement capability. An organization that conforms to the characteristic of mobility will be capable of accomplishing its mission with its organic transportation assets and remain

within acceptable proximity to the force it is supporting. The goal is 100 percent mobility for personnel and equipment using only organic vehicles.

Full-Spectrum Capable. Because a hospital is a large investment for the Army in terms of personnel, equipment, and strategic lift assets, one platform must be relevant for all types of operations at all levels of war. The Army cannot afford to develop multiple platforms, each for the purpose of supporting a specialized operation. According to FM 3-0 “full-spectrum operations include offensive, defensive, stability, and support operations” (2001b, 1-15). Echelon-III hospitals, like other Army units, must be capable of operating “effectively anywhere on the spectrum of military operations without substantial augmentation to perform diverse missions within a single campaign” (White Paper 2001d, 11). Furthermore, with the “train-alert-deploy” environment prevalent today and the inherent challenges highlighted in chapter 2 with regard to tailoring for deployment, the optimal unit structure must be capable of rapidly deploying with minimal tailoring or disruption to unit effectiveness. Consequently, for this study, the subject's ability to meet the criterion of full-spectrum capable is based on three factors. The three factors of full-spectrum capable are: (1) functionality across the operational spectrum, (2) ability to transition quickly from one type of operation to another, and (3) ability to maintain unit integrity for various SSC operations and or missions.

Reduced Footprint/Economy. Recent MRI briefings indicate that one of the key elements the MRI lends to AMEDD transformation is that it reduces the theater medical footprint. It defines reduced footprint as the “reduction in the number of personnel, equipment, and systems in the theater required to perform the mission” (AMEDD 2002a). To reduce the footprint of a unit one could simply eliminate capability thus reducing the

number of assets required to deploy. However, reducing capability must be balanced with requirement and mission accomplishment. When reducing the footprint the structure must still support the CSS characteristic of economy; that is “providing the most efficient support to accomplish the mission” (FM 3-0 2001b, 12-4). For this study, reduced footprint/economy will take into account the number of C-5s required to deploy the unit and, for simplicity, the number of beds authorized in the unit, which will represent the unit's capability. To evaluate each subject, its “footprint” characteristics and its capability will be subjected to the following equation:

$$\frac{\text{Number of Beds}}{\text{Average Number of Subjects' Beds}} \times \frac{\text{Average Number of C-5 to Deploy}}{\text{Number of C-5s to Deploy Subject}} = \text{Ratio}$$

Note that the equation uses the subjects' average footprint characteristics. This method is used to establish a baseline in order to evaluate all platforms against a set value and produce a ratio as the resultant. The individual subject's number of beds is the numerator because more beds equates to more capability and thus is better. The individual subject's number of C-5s is in the denominator because fewer C-5s equate to less consumption of resources and thus is better. Overall a larger resultant is better and indicates a subject that more closely meets the criteria of reduced footprint/economy. A resultant of 1 indicates the subject is as efficient in utilizing the footprint it consumes as the average of the subjects used in this study. A platform with less than a 1 is not as efficient as the average and with more than 1 is more efficient than the average.

Step 2--Select subjects

Step 2 involved selecting several echelon-III hospital platforms as subjects for comparison. Both current and discontinued deployable hospital structures were reviewed

and several selected as subjects for this study. The study did not consider any hospital larger than the 248-bed MRI CSH due to the focus on SSC operations. Other US military services' hospitals were also considered and included as appropriate. This method provided for an acceptable range of subjects to compare without requiring the researcher to develop fictional hospital structures that cannot be tested for validity. The four subjects, with table of organization and equipment (TOE) number where applicable, include the: (1) 248-bed MRI CSH (Corps) (TOE 08955A000), (2) 84-bed Hospital Company (TOE 08958A000), (3) 30-bed Mobile Army Surgical Hospital (TOE 08765L000), and (4) 25-bed Expeditionary Medical Support + 25 (EMEDS+25). A detailed review of the subjects' force structure, capabilities, and requirements is conducted in step 3 of the process.

One structure, worth mentioning here, that was considered but not selected for inclusion in the study is the Forward Surgical Team (FST). The FST was excluded for evaluation primarily because it is not an echelon-III hospital. As such, the FST does not provide the ancillary care and services or the holding capability of a deployable hospital. Critics may argue that in very recent operations the FST has been augmented and used as a hospital. Though this argument may be true it is outside the scope of this study to develop new platforms for evaluation purposes. However, the recommendations include a brief discussion of uses and or modification to the FST.

Step 3--Evaluate subjects' performance of criteria on an ordinal scale

In step 3 each of the subjects' force structure, capabilities, and requirements were developed in detail. Then each subject was evaluated against each of the criterion from step 1 and assigned a value on an ordinal scale. The scale applied is a graduated rating

from 1-to-4. The rating is based upon how well the platform (subject) meets the intended goal of the criterion. In this methodology of assessing the evidence, to receive a higher number is better. The ratings 1-to-4 are defined as follows:

1--Fails to meet the intend goal

2--Partially meets the intended goal

3--Largely meets the intended goal

4--Completely meets the intended goal

Step 4--Organize information in a comparison matrix and analyze results

After the subjects were evaluated against each criterion, the assigned value was recorded in a comparison matrix. The comparison matrix was used to calculate an overall score for each of the subjects. The 1-to-4 ratings originally based on an ordinal scale were treated as interval scale values for this calculation. The values in each column were added to develop an overall score for each subject. It is recognized, as Krathwohl (1998) cautioned, that there is no guarantee of equality of the interval between the 1-to-4 values, so truly scientific results are questionable. Krathwohl did indicate this type of analysis is common and "since, however, the data yield useful generalizations when interpreted this way, we assume the underlying concept to be acceptable" (1998, 390). Further, the overall scores allow for a visual depiction of the subjects in a side-by-side comparison of their abilities to meet the goals of the five criteria. If a subject completely met all of the intended goals it would have scored a twenty. If a subject failed to meet any of the goals it would still register a score of five. If two subjects score the same overall score there could still be significant differences between the platforms because, again, the original numbers were based on an ordinal scale. The comparison matrix shell is shown in table 2.

Table 2. Comparison Matrix Shell

Criteria/ Subject	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Total
Subject 1	1-to-4	1-to-4	1-to-4	1-to-4	1-to-4	Overall Score
Subject 2	1-to-4	1-to-4	1-to-4	1-to-4	1-to-4	Overall Score
Subject 3	1-to-4	1-to-4	1-to-4	1-to-4	1-to-4	Overall Score
Subject 4	1-to-4	1-to-4	1-to-4	1-to-4	1-to-4	Overall Score

Step 5--Interpret and report results

In step 5 the results of the research were interpreted and conclusions developed. In general the information presented in step 5 is in an advantages and disadvantages type format for each platform. The information was summarized and recommendations are provided in the final chapter. In addition to the recommendations, the feasibility of combining certain aspects of various platforms was briefly explored. This was done because perhaps by combining the more attractive aspects of a few platforms, an optimal echelon-III hospital can be developed for supporting SSC operation while remaining a viable asset for employment during a MTW.

CHAPTER 4

ANALYSIS

The literature review clearly portrayed contemporary operational issues that in many cases significantly differ from the operational issues addressed when the US Army used the requirements determination process to develop the Legacy Force. Today the challenge for the Army is to develop Interim Force units that possess the characteristics necessary to operate successfully under present and emerging constraints, requirements and employment considerations. The AMEDD is certainly not immune from this dilemma with regard to developing echelon-III hospitals capable of supporting the Interim Force. Therefore, the primary question asked in this study is does the US Army Interim Force need a strategically deployable, 100 percent mobile hospital that is smaller than the 248-bed Combat Support Hospital (CSH) to provide echelon-III Combat Health Support (CHS) for military operations short of a major theater war?

In the preceding chapter, the investigator described the systematic and analytical research design selected in order to gather and analyze information necessary to develop conclusions with regard to the primary research question. In general, the research approach centers on a qualitative study that evaluates how well various hospital structures meet specific performance criteria. The evaluation employs the goal-based evaluation method described in *Methods of Educational & Social Science Research* (Krathwohl 1998). The following five-step process summarizes the research model:

Step 1--Select criteria (performance “goals” for the echelon-III platform)
Step 2--Select subjects
Step 3--Evaluate subjects’ performance of criteria on an ordinal scale
Step 4--Organize information in a comparison matrix and analyze results
Step 5--Interpret and report results

In the preceding chapter, the investigator identified and defined five performance criteria that represent the characteristics considered most significant for an echelon-III hospital to possess in order to support small-scale contingency (SSC) operations. The five criteria are flexible, deployable, mobile, full-spectrum capable, and reduced footprint/economy. Next the investigator identified the subjects that were selected for evaluation. The four subjects selected were the 248-bed Medical Reengineering Initiative (MRI) CSH (Corps), the 84-bed hospital company, the 30-bed Mobile Army Surgical Hospital (MASH), and the 25-bed Expeditionary Medical Support + 25 (EMEDS+25).

In this chapter the investigator reports the study findings, presenting specific evidence collected for each subject and evaluating the subjects against each of the five criteria. The subjects were analyzed separately without comparison to each other, except tangentially for reduced footprint/economy. For reduced footprint/economy the subject's "footprint" efficiency was compared against the average of all the subjects' footprint efficiency. Each subject was rated on how well it met the intended goal of each criterion and earned a rating on a scale of 1-to-4 as defined in the preceding chapter. The evidence produced for the evaluation centers on the subjects' doctrinal force structure, capabilities, and requirements characteristics. These characteristics include percent of the unit that is organically mobile, lift requirements (number of C-5s), medical capabilities (number of beds), and notable short falls or support requirements. The doctrinal force structure, capabilities, and requirements outlined for the Army structures were extracted from four sources. First, doctrinal field manuals (FM) were used largely for employment characteristics. Second, mission training plan (MTP) manuals of the Army Training and Evaluation Program (ARTEP) were used to establish the hospital's capabilities. Third, the

United States Army Force Management Support Activity (USAFMSA) provided tables of organization and equipment (TOEs) and modified TOEs (MTOEs), which contain detailed statistics and descriptions of the unit's organizational structure and requirements. Lastly, the MRI implementation office provided additional deployment considerations. The doctrinal force structure, capabilities, and requirements provided for the EMEDS structure was extracted from the Air Force's Concept of Operations (CONOPS) for Expeditionary Medical Support (EMEDS) / Air Force Theater Hospital (AFTH) System manual published by Air Combat Command (ACC), Office of the Command Surgeon.

Step 3--Evaluate subjects' performance of criteria

How well does the 248-bed MRI CSH (Corps) (TOE 08955A000) provide echelon-III CHS for SSC operations? Based on the force structure, capabilities, and requirements detailed in figure 2, the 248-bed CSH was evaluated against each of the criterion thus addressing subordinate questions 1a through 1e.

1a. Is the CSH flexible enough to provide echelon-III CHS for SSC operations? The CSH has a semimodular design with a tailorable 44-bed early entry module. The CSH is semi-modular in that it has two subordinate companies that can function independently with only minor augmentation from its HHD. Additionally, the intensive care units (ICUs), intermediate care wards (ICWs), and operating rooms (ORs) are modular and interchangeable. The early entry module does not have a separate unit type code (UTC) and “is not a stand-alone element and requires early coordination for sustainment” (FM 4-02.10 2000b, H-11). The large size of the CSH limits its use to more robust SSC operations unless tailored or task organized. For flexibility the CSH received a performance rating of 2--partially meets the intended goal.

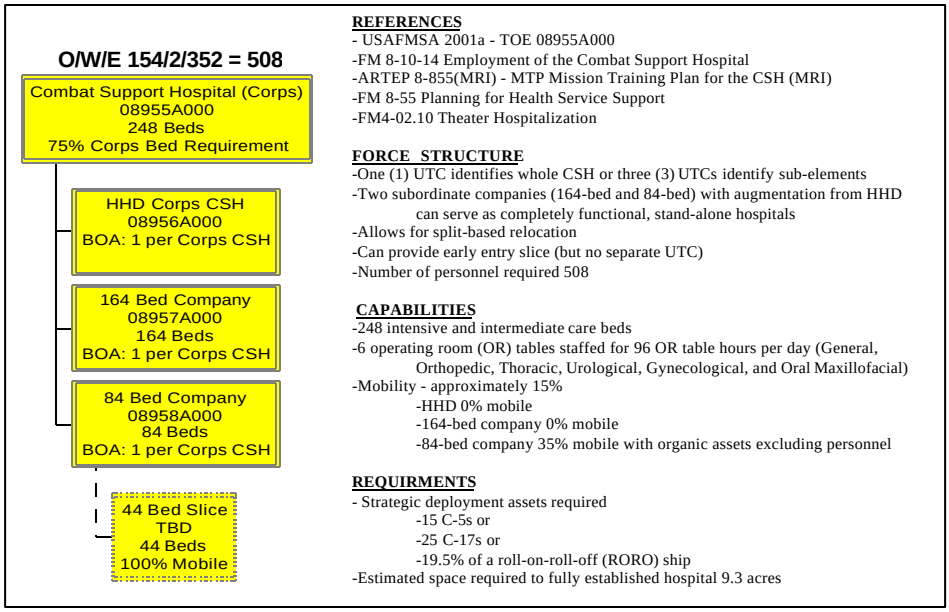

Figure 2. CSH Characteristics

1b. Is the CSH deployable enough to provide echelon-III CHS for SSC operations? The CSH is structured so that one UTC identifies the whole unit. Three additional UTCs can be used to separately identify its two hospital companies and its headquarter detachment (HHD). The unit has the ability to develop load plans based on the two company sized elements that correspond with their UTCs. However, the CSH requires fifteen C-5 aircraft to deploy all of its vehicles and equipment. To meet the goal for deployability the unit should be capable of deploying at the pace of the force supported. In this case it would take several days to load, fly, land, and unload fifteen C-5s full of DEPMEDS containers even at some of the most capable airports. As discussed in the literature review, SSC operations will often occur in austere environments; environments where the airports of debarkation (APOD) may not be capable of handling C-5s and/or the maximum on ground number of aircraft is significantly restricted. Unless

tailored or task organized this platform consumes a disproportionate amount of strategic deployment assets. If tailored or task organized it requires a derivative UTC which significantly disrupts the planners ability to provide strategic lift options. For deployability the CSH received a performance rating of 1--fails to meet the intended goal.

1c. Does the CSH have enough mobility to provide echelon-III CHS for SSC operations? FM 4-02.10 contains conflicting data with regard to the CSH mobility. It says, “the corps CSH is 35 percent mobile with organic assets” (2000b, 2-2), but later says, “the 84-bed hospital company is 35 percent mobile” (2000b, 4-8). A review of the TOE supports the later. Its HHD is zero percent organically mobile. Its 84-bed company is 35 percent mobile. Its 164-bed company is zero percent mobile. As a result, overall the CSH is approximately 17 percent mobile excluding personnel mobility. Given a movement scenario that requires the CSH to move itself and a one-day round trip for its vehicles, at seventeen percent mobility it would take six days, working around the clock, to move the entire CSH. A one-day round trip is conservative when considering four to six hours for loading and preparing to move, five hours to perform a 100-kilometer road march at thirty kilometers per hour, three to four hours to unload and prepare to return, and five additional hours for the return road march. Even the standard in CSH mission training plan (MTP) for two situational training exercises (STXs) - relocate hospital to a new operating site, and establish hospital area of operations - is just at five days with eighty-five percent external transportation support required (ARTEP 8-855-MTP 2000a). For mobility the CSH received a performance rating of 1--fails to meet the intended goal.

1d. Does the CSH have enough full-spectrum capability to provide echelon-III CHS for SSC operations? The CSHs 248 ICU and ICW beds combined with organic

general, orthopedic, thoracic, urological, gynecological, and oral maxillofacial surgery capability indicates it is organized medically to handle the high end of the operational spectrum. On the lower end of medical procedures the CSH has two, small “specialty clinics;” one in each of the companies. As pointed out in the literature review, hospitals deployed on SSC operations in recent history have been required to provide extensive sick-call and physical exam services. The CSH possesses these capabilities but disproportionately to the high-end requirements. With regard to transitioning from one type of operation to another and maintaining unit integrity it appears the CSH is marginally prepared. Designed around two separate companies that can stand alone, doctrinally it can employ a company in a humanitarian assistance roll, for example, while employing the other in an offensive operation support role. To maintain unit integrity the medical requirements of the SSC would either have to be fairly large or the organization would have to live with employment of excess capacity. For full-spectrum capable the CSH receives a performance rating of 3--largely meets the intended goal.

1e. Does the CSH have an appropriately reduced footprint/ economy to provide echelon-III CHS for SSC operations? As this is the first platform evaluated it was necessary to calculate the average number of beds and C-5s for all the subjects in order to complete the footprint calculations. The average number of beds is 96.75 [(248+84+30+25)/4]. The average number of C-5s is 6.25 [(15+7+2+1)/4]. The following footprint characteristics apply to the CSH: 248-bed capacity and fifteen C-5 aircraft required to deploy. Using the equation developed in chapter 3 for the reduced footprint/economy criteria the calculation for the CSH is depicted in the following equation:

Number of Beds	(248)	x	Average Number of C-5 to Deploy	(6.25)	= 1.07
Average Number of Subjects' Beds	(96.75)		Number of C-5s to Deploy Subject	(15)	

Although the CSH uses a large number of aircraft to deploy, the substantial capability it provides is a significant factor in its footprint calculation. For reduced footprint/economy the CSH received a performance rating of 3--largely meets the intended goal.

How well does the 84-bed hospital company (TOE 08958A000) provide echelon-III CHS for SSC operations? The 84-bed hospital company is the same company structure that is part of the 248-bed MRI CSH. It is evaluated here as if it were a stand-alone unit with the required command and control elements from HHD already embedded as part of its TOE. The notable augmentation required of HHD is approximately 17 to 23 personnel, five vehicles, two trailers, and a laundry unit. This limited augmentation will not significantly change the platforms doctrinal characteristics. The force structure, capabilities, and requirements for the 84-bed hospital company are detailed in figure 3.

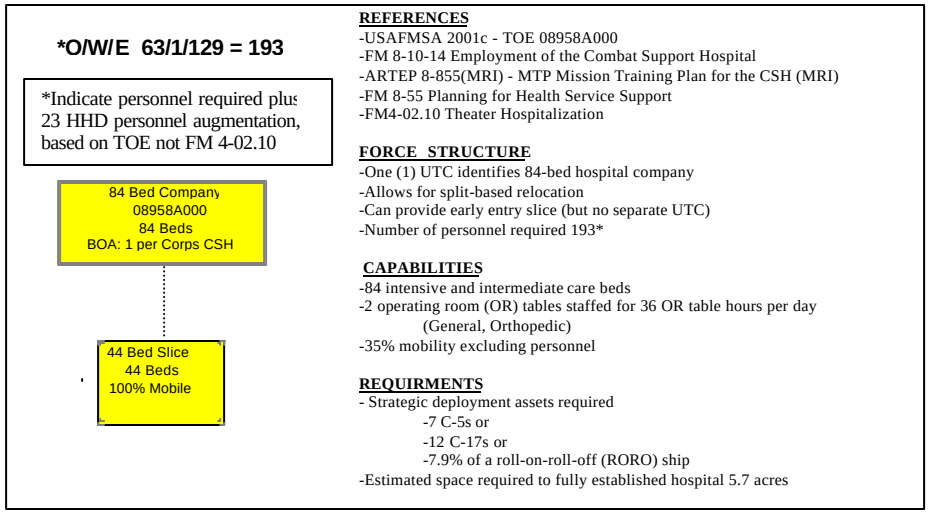

Figure 3. 84-bed Hospital Company Characteristics

2a. Is the hospital company flexible enough to provide echelon-III CHS for SSC operations? The 84-bed hospital has a limited modular design and doctrinally can employ a tailorable 44-bed early entry module. Its two ICUs, three ICWs, and two ORs are modular and interchangeable. The early entry module does not have a separate UTC. It can be deployed as a first increment but then requires "immediate follow-on of the remaining 84-bed company" (FM 4-02.10 2000b, 4-8). Using an early entry module scenario, this unit would require two derivative UTCs for deployment. Further, once the 44-bed tailored module is deployed or echeloned forward the remaining 40 beds can no longer function as a hospital. The size of this unit allows for its employment in medium to large SSC operations unless tailored or task organized for smaller operations. For flexibility the 84-bed hospital received a performance rating of 1--fails to meet the intended goal.

2b. Is the hospital company deployable enough to provide echelon-III CHS for SSC operations? The 84-bed hospital has one UTC. Without assuming a specific tailored requirement, the unit has only the ability to develop load plans based on an 84-bed deployment. The company requires seven C-5 aircraft to deploy all of its vehicles and equipment. If the 44-bed increment is deployed then six C-5 aircraft are required. The doctrinally "suggested" 44-bed element drops two ICWs, the specialty clinics, and half of the administrative elements from the 84-bed hospital. In either configuration this platform consumes a significant amount of strategic deployment assets. For deployability the 84-bed hospital received a performance rating of 2--partially meets the intended goal.

2c. Does the hospital company have enough mobility to provide echelon-III CHS for SSC operations? The 84-bed hospital is thirty-five percent mobile. However,

doctrinally a 44-bed increment requires “100 percent of its TOE equipment and supplies to be transported in a single lift, using authorized vehicles” (FM 4-02.10 2000b, 4-8). The mobility numbers do not include personnel mobility requirements nor do they include patient mobility requirements. However, with only organic vehicle assets this unit can completely relocate, up to 100 kilometers, in less than three days. Additionally, it can establish echelon-III capability at the new location within twenty-four hours. For mobility the 84-bed hospital received a performance rating of 2--partially meets the intended goal.

2d. Does the hospital company have enough full-spectrum capability to provide echelon-III CHS for SSC operations? The 84-bed hospital has two ICUs and three ICWs combined with organic general and orthopedic surgery capability. It has a small specialty clinic to provide sick call, physical exams, and other services. It lacks dental service capability. The structure in general is weighted more toward higher intensity combat casualties. However, it does possess the capability to provide lower-end medical services in a proportion reasonable to its overall capacity without substantial augmentation. The unit can support various operations along the spectrum but its capability to transition from one type of operation to another is limited due principally to its lack of modularity. Recent history suggests that 84-beds is still too large to maintain unit integrity for the majority of SSC operations. For full-spectrum capable the 84-bed hospital received a performance rating of 2--partially meets the intended goal.

2e. Does the hospital company have an appropriately reduced footprint/ economy to provide echelon-III CHS for SSC operations? The 84-bed hospital has the following footprint characteristics: 84-bed capacity and seven C-5 aircraft required to deploy. The footprint calculation is shown in the following equation:

Number of Beds	(84)	x	Average Number of C-5 to Deploy	(6.25)	= .78
Average Number of Subjects' Beds	(96.75)		Number of C-5s to Deploy Subject	(7)	

The 84-bed hospital consumes a disproportionate amount of aircraft for the capability it provides. For reduced footprint/economy the 84-bed hospital received a performance rating of 2--partially meets the intended goal.

How well does the 30-bed Mobile Army Surgical Hospital (TOE 08765L000) provide echelon-III CHS for SSC operations? The force structure, capabilities, and requirements for 30-bed MASH used in this study are largely theoretical. They are largely theoretical because the AMEDD never fielded a 30-bed MASH. In the late 1980's and early 1990's the AMEDD developed the force structure, doctrine, and training plans for the 30-bed MASH. This MASH structure was originally intended to be part of the Medical Force 2000 (MF2K) structure (FM 8-55 1994b). Presumably it was designed as a replacement for the 60-bed MASH (USAFMSA 1988) that was unable to perform as desired during Desert Shield/ Desert Storm (DS/DS) (Steinweg 1993). The 212th MASH is the only MASH unit still in the US Army inventory. And it is scheduled to convert to an MRI CSH (Corps) in year 2004. The 212th MASH is a 36-bed facility. It has evolved over the years and currently the “unit is built as an exception to MTOE standardization” (USAFMSA 2002b, 1). Consequently, its structure loosely employs elements from the Army's 60-bed MASH TOE and 30-bed MASH TOE. It appears that the 30-bed MASH concept was overcome by the development of forward surgical teams (FSTs) and MRI. However, despite the 30-bed MASH having never been fielded extensive force structure, doctrine, and training plan documents exits for this unit. Figure 4 indicates the doctrinal manuals referenced and the force structure, capabilities, and requirements characteristics

of the 30-bed MASH. It should be noted that because the 30-MASH was never fielded USAFMSA did not have the TOE. The AMEDD's Director of Combat Developments provided the TOE for this study. The platform was evaluated against each of the criterion thus addressing subordinate questions 3a through 3e.

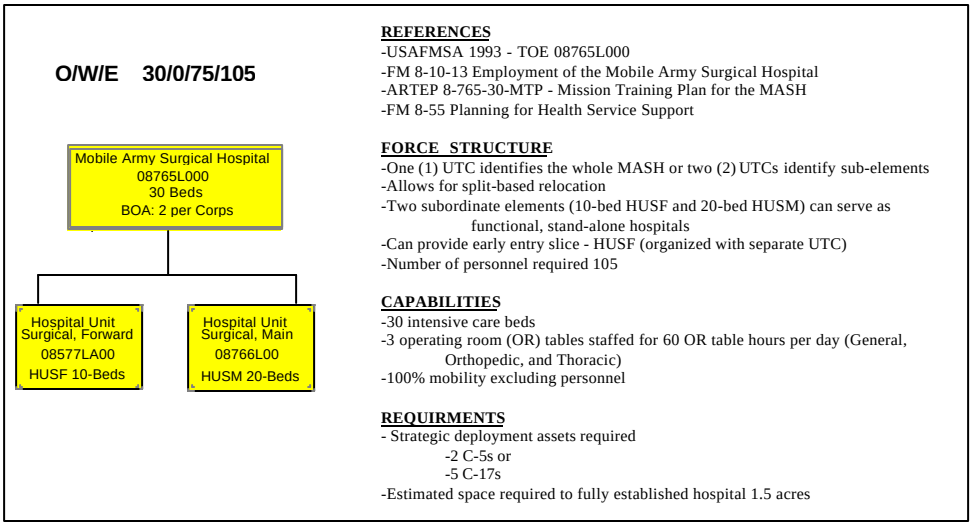

Figure 4. MASH Characteristics

3a. Is the MASH flexible enough to provide echelon-III CHS for SSC operations? The MASH has a semi-modular design and can doctrinally employ the 10-bed hospital unit surgical, forward (HUSF) as an early entry module. Its three ICUs, and three ORs are modular and interchangeable. The early entry module does have a separate UTC. The HUSF “can operate detached for up to 48 hours” (FM 8-55 1994b, 5-33) but requires service and administrative support. The HUSF when detached from the main hospital must be supported by at least an echelon-II medical unit. “The HUSF . . . will be dependent upon the unit to which it is attached . . . for medical laboratory, x-ray, medical resupply, and medical regulating support” (FM 8-10-13 1992, 2-3). However, if the

HUSF is separated from the rest of the MASH, the HUSM, remains a viable hospital capable of providing echelon-III care. The MASHs modular design and small size allows its employment in any of the SSC operations similar to those of recent history without tailoring or task organizing. Yet because of its limited size it may not fully meet the requirements of larger SSC operations, thus requiring the employment of multiple units. However, deploying multiple fixed structured units is more favorable than deploying a unit or units that requires task organization. For flexibility the 30-bed MASH received a performance rating of 3--largely meets the intended goal.

3b. Is the MASH deployable enough to provide echelon-III CHS for SSC operations? The MASH is structured so that one UTC identifies the whole unit. Additionally, if the whole unit is not required for an operation, planners can identify it by two separate UTCs - one for the HUSF and one for the HUSM. Based on this TOE structure the unit has the ability to develop firm load plans prior to receiving deployment orders. Actually, FM 8-10-13, appendix E provides a tactical standard operating procedure for unit movement that includes detailed load plans for the entire unit (1992). The MASH requires two C-5 aircraft to deploy all of its vehicles and equipment and less than one C-5 if only deploying the HUSF. For deployability the MASH received a performance rating of 4--completely meets the intended goal.

3c. Does the MASH have enough mobility to provide echelon-III CHS for SSC operations? The 30-bed MASH is doctrinally 100 percent mobile. Based on the TOE and sample load plans in FM 8-10-13 it has the capability to transport 100 percent of its equipment and supplies organically (1992). However, seating for personnel is limited to seventy-seven spaces. With a required strength of 105 the unit is only capable of

transporting seventy-three percent of its personnel in one lift. A twenty-eight seat shortfall would require external support of at least two five-ton vehicles or a bus. The MTP establishes the standard for the MASH to relocate and establish operations at just over twenty-four hours. For mobility the MASH received a performance rating of 3--largely meets the intended goal.

3d. Does the MASH have enough full-spectrum capability to provide echelon-III CHS for SSC operations? The MASH has three ICUs and organic general, orthopedic, and thoracic surgery capability. It lacks any capability to provide dental services, sick-call, physical exams, or other medical services unless augmented. The structure is fully weighted toward high intensity combat casualties. Even for the smaller SSC operations, this unit alone is not capable of providing all medical services required. It must either be attached to an echelon-II medical unit or augmented with personnel and equipment to perform medical services at the lower end. The MASH is capable of transitioning from one operation to another while maintaining unit integrity provided the operations are at the higher end of the spectrum. However, because of its size, the MASH could be a viable option to satisfy the surgical and holding requirements for the type of SSC operations in recent history and viable in MTW operations. For full-spectrum capable the MASH received a performance rating of 2--partially meets the intended goal.

3e. Does the MASH have an appropriately reduced footprint/ economy to provide echelon-III CHS for SSC operations? The MASH has the following footprint characteristics: 30-bed capacity and 2 C-5 aircraft to deploy. The footprint calculation is shown in the following equation:

Number of Beds	(30)	x	Average Number of C-5 to Deploy	(6.25)	= .97
Average Number of Subjects' Beds	(96.75)		Number of C-5s to Deploy Subject	(2)	

For reduced footprint/economy the MASH received a performance rating of 3--largely meets the intended goal.

How well does the 25-bed Expeditionary Medical Support + 25 (EMEDS+25) provide echelon-III CHS for SSC operations? The Air Force's EMEDS/AFTH is a deploy hospital system designed around a building block approach for providing up to echelon-III medical care in the theater of operation. “The role of the AFTH is to provide individual bed-down and theater-level medical/dental services for deployed forces or select population groups within the entire spectrum of Small-scale Contingencies (SSCs) through Major Theater War (MTW)” (ACC 1999, 1). Theoretically any number of building blocks could be combined to develop an AFTH as large as desired. However, the EMEDS/AFTH system is doctrinally designed to provide echelon-II medical care with limited holding capability up to a fully functional 114-bed echelon-III hospital. The limitation to 114-bed appears to be driven partially by budget and force development constraints but mainly by the Air Force's assessment of capabilities required. Because this study is focused on SSC operations the EMEDS+25 hospital is used for evaluation purposes. The EMEDS+25 includes three primary increments. The complete EMEDS+25 force structure, capabilities, and requirements are detailed in figure 5. The platform was evaluated against each of the criterion thus addressing secondary questions 4a through 4e

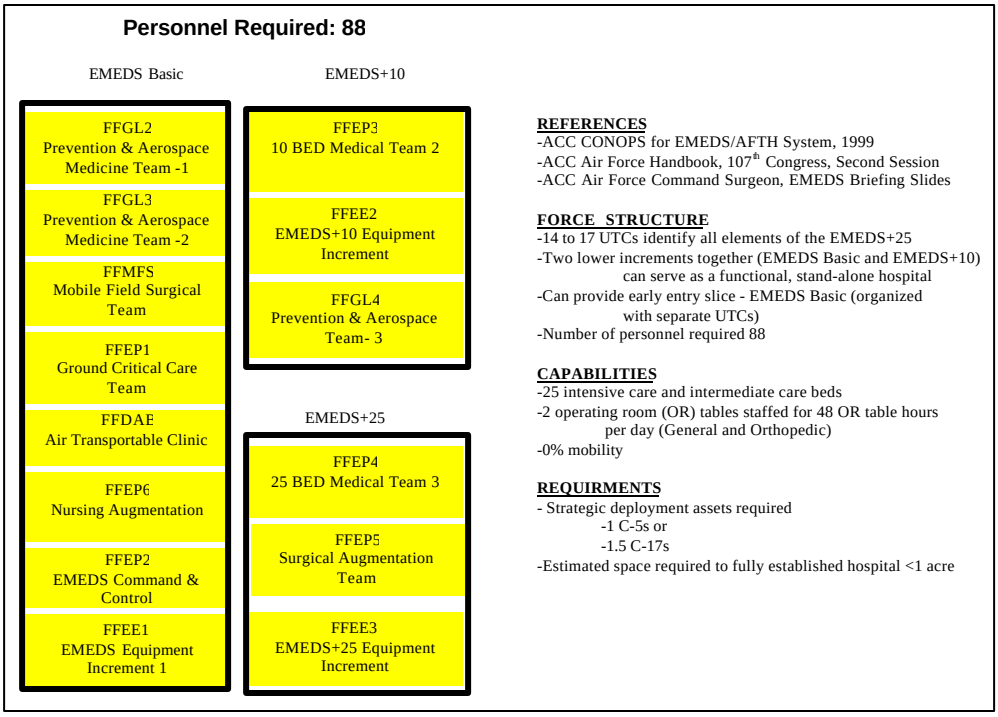

Figure 5. EMEDS+25 Characteristics

4a. Is the EMEDS+25 flexible enough to provide echelon-III CHS for SSC operations? The complete EMEDS+25 platform is composed of three modules--called "increments" by the Air Force. The three increments are EMEDS Basic, EMEDS+10, and EMEDS+25. The three increments together can be deployed as an early entry echelon-III hospital. If a smaller early entry hospital is required the first two increments can stand-alone and provide echelon-III support. Aside from the EMEDS Basic, the increments cannot function independently. However, the increments themselves are modular. The increments are "composed of UTC building blocks providing personnel and equipment to meet specific operational requirements" (ACC 1999, 2). For example, the EMEDS Basic is composed of eight building blocks. Not all of the building blocks are required to deploy in order to make EMEDS Basic a functional element. Moreover, there

are over twenty-five additional but separate “medical augmentation” building blocks, each with separate UTCs, that can be selected for employment with an EMEDS Basic element. Consequently, the EMEDS/AFTH system design allows planners significant latitude to tailor a force package without having to develop derivative UTCs. However, planners must ensure the various building blocks selected are collectively supportable. Specialty teams deployed solely with EMEDS Basic may not have the infrastructure required to provide their service. Once an EMEDS+25 unit is in theater it is not doctrinally designed to conduct split-based operations. None of the three increments can be separated from the structure to provide an additional functional element. The EMEDS+25 modular design and small size allows its employment in any of the SSC operations similar to those of recent history. Further, the modularity of the system as a whole allows employment of additional building blocks to expand the EMEDS+25 in order to meet the medical requirements of larger SSC operations. However, the EMEDS+25 is composed almost completely of medical personnel. The CONOPS manual indicates “base support personnel will be needed to connect this system to the base infrastructure” (ACC 1999, 38). The manual provides a long list of personnel and support requirements, which, by assumption, includes the existence of a base support structure capable of supporting the unit. The unit cannot function geographically separated from a base support structure. For flexibility the EMEDS+25 received a performance rating of 3--largely meets the intended goal.

4b. Is the EMEDS+25 deployable enough to provide echelon-III CHS for SSC operations? The standard EMEDS+25 structure contains seventeen UTCs. Depending on the reference, the “resupply” building block for each of the three increments may or may

not be considered part of the standard EMEDS increment. Consequently, planners may indicate that between fourteen and seventeen UTCs identify the whole unit. Each of the UTCs have a standardized load plan that includes a detailed listing of everything from personnel required, down to number of pallets and boxes required of each load plan. The EMEDS+25 requires approximately one C-5 aircraft to deploy all of its equipment. For deployability the EMEDS+25 received a performance rating of 4--completely meets the intended goal.

4c. Does the EMEDS+25 have enough mobility to provide echelon-III CHS for SSC operations? The EMEDS+25 is doctrinally zero percent mobile. This platform is designed to be flown into theater and with significant assistance of base support personnel, facilities, and equipment establish operations on the airfield or in near proximity. It has no organic vehicles. For mobility the EMEDS+25 received a performance rating of 1--fails to meet the intended goal.

4d. Does the EMEDS+25 have enough full-spectrum capability to provide echelon-III CHS for SSC operations? The EMEDS+25 provides a very balanced medical capability. Its organic medical capabilities include aerospace medicine, preventive medicine, dental, primary care, emergency care, critical care, trauma surgical resuscitation and stabilization, and postoperative holding up to twenty-five patients. It does not have organic mental health specialists. Overall the design limits the ability to provide services anywhere except at the hospital or perhaps on the base to which it is assigned. Further, the design limits its ability to support ground units that are operating at extended distances from the base. Because of its heavy reliance on base support assets its utility in smaller and extended lines of communication type operations is significantly

reduced. The ability to transition from one type of operation to another is limited. With only the EMEDS Basic being capable of functioning independently, it would basically require the whole EMEDS+25 platform to first disengage from one operation before moving to provide support elsewhere. For full-spectrum capable the EMEDS+25 received a performance rating of 3--largely meets the intended goal.

4e. Does the EMEDS+25 have an appropriately reduced footprint/ economy to provide echelon-III CHS for SSC operations? The EMEDS+25 has the following footprint characteristics: 25-bed capacity and one C-5 aircraft required to deploy. The footprint calculation is shown in the following equation:

$$\frac{\text{Number of Beds } (25)}{\text{Average Number of Subjects' Beds } (96.75)} \times \frac{\text{Average Number of C-5 to Deploy } (6.25)}{\text{Number of C-5s to Deploy Subject } (1)} = 1.61$$

It is clear the EMEDS provides a significant capability in proportion to the assets its organic structure consumes. However, the footprint calculation for the EMEDS+25 is somewhat skewed due to its significant reliance on base support. Without vehicles, support equipment, or living quarters for its personnel the EMEDS+25 uses only a very small footprint for the movement and establishment of its organic equipment. Consequently, a more thorough analysis than is possible with this study is required to develop a comparable footprint calculation for the EMEDS+25. Therefore, without clearer data the EMEDS+25 is evaluated conservatively for reduced footprint/economy; it received a performance rating of 3--largely meets the intended goal.

Step 4--Organize information in a comparison matrix and analyze results

The comparison matrix shown below was populated with the ratings obtained in step 3 of the model. Recall that the 1-to-4 ratings were based on an ordinal scale.

However, in the table the ratings were treated as interval scale values and used to calculate an overall score for each of the subjects. As stated before there is no guarantee of equality of the interval between the 1-to-4 values so truly scientific results are questionable. More importantly, the overall scores are provided merely as means of visually depicting a side-by-side view of how the subjects compare in meeting the cumulative goals of the five criteria. For comparison purposes a subject that completely meets all of the intended goals would score 20 and a subject that failed to meet any of the goals would still register a score of 5. The comparison of the subjects' performance is conducted in step 5 of the model and presented in the next chapter. The comparison matrix is provided in table 3.

Table 3. Comparison Matrix

Criteria/ Subject	Flexible	Deployable	Mobile	Full-spectrum Capable	Reduced Footprint/ Economy	Total
248-bed CSH	2	1	1	3	3	10
84-bed Hospital	1	2	2	2	2	9
30-bed MASH	3	4	3	2	3	15
25-bed EMEDS+25	3	4	1	3	3	14

Step 5--Interpret and report results

Step 5 reports the results by answering the subordinate question relative to each platform in an advantages and disadvantages type format. An overall summary that interprets the findings is presented at the end of step 5.

How well does the 248-bed MRI CSH (Corps) (TOE 08955A000) provide echelon-III CHS for SSC operations? Though not included in this study, it appears as if standardization is one of the most significant factors contributing to the AMEDD's plan regarding converting all deployable hospitals to 248-bed CSHs. Further study in this area would be helpful, but it seems obvious that advantages are gained from standardization. Under the current personnel system where soldiers are transferred from unit to unit, a single standardized platform should at a minimum reduce familiarization and training requirements. The other important advantage for the CSH is its full-spectrum capability. The full-spectrum capability inherent in the CSH structure means that for any given SSC operation, one unit can usually be tasked to satisfy all requirements which eliminates pulling pieces together from across the Army in order to accomplish one mission. Though the CSHs footprint as calculated for this study is very reasonable for the capability it provides, its considerable size results in challenges when supporting SSC operations. Further, the CSH's structural shortfalls with regard to flexibility, deployability, and mobility virtually ensures that for every SSC mission a CSH will have to task organize or tailor an ad hoc package for deployment. Under those circumstances much of the advantage gained from standardization is lost as standard operating procedures, packing lists, and load plans are scratched and new procedures are carved out at the last minute. More importantly, substantial tailoring will cause units to experience a lesson already learned by the Air Force. That is tailoring for deployment “had an adverse effect on morale” and “destroyed both the formal and informal leadership and group dynamics of the unit” (GAO 1993a, 12).

How well does the 84-bed hospital company (TOE 08958A000) provide echelon-III CHS for SSC operations? The 84-bed hospital company as a stand-alone hospital has no notable advantages. What little advantage it has over the CSH in terms of deployability and mobility is lost due to lack of flexibility and full-spectrum capability. Aside from the fact that its current structure does not include the necessary command and control elements, it is substantially hindered by not having a set structure and UTC for the 44-bed early entry module. As currently documented, even if the whole company was called on to support any type operation it would have to develop a derivative UTC in order to deploy. Furthermore, even though the size of the hospital was reduced, no considerable efficiencies were gleaned in the administrative portion of the hospital so its footprint results are worse than the other platforms analyzed.

How well does the 30-bed Mobile Army Surgical Hospital (TOE 08765L000) provide echelon-III CHS for SSC operations? Of the platforms analyzed, the MASH is clearly the best balanced with regard to all five characteristics required to support SSC operations. Its deployability and footprint characteristics appear to be compatible with present and emerging constraints. Its mobility is arguably its strongest point. Originally conceived to support a combat division in mobile operations, its mobility characteristics crosswalk nicely with the SSC requirement. Further, its ability to conduct split based operations greatly increases its flexibility and enables it to more readily conform to mission needs. The biggest advantage in the MASH is that unlike the other three platforms it is not completely lacking in any of the areas analyzed in this study. However, that is not to say it free of shortfalls. It is lacking in the area of full-spectrum capability. It can provide a full range of medical services even at the lower end of the spectrum, but

with its heavy emphasis on surgical capability it is not nearly as efficient as the EMEDS+25 platform. Nor is it efficient enough to handle most SSC operations without either lower ended medical augmentation or being co-located with an echelon-II medical company.

How well does the 25-bed Expeditionary Medical Support + 25 (EMEDS+25) provide echelon-III CHS for SSC operations? The EMEDS+25 incorporates many aspects that are advantageous in echelon-III hospitalization for SSC operations. Its deployability and full-spectrum capability are unsurpassed by the other platforms. The building block approach using multiple UTCs indescribably aids planners when developing the force package for a given mission. However, as advantageous as these aspects are and though it rated high on the comparison matrix, its limitations make it an unworkable solution for the Army. The primary disadvantages are the total lack of mobility and its complete reliance upon base support units for everything from cots to power generation to transportation. This "footprint" limitation would require a complete overhaul of Army support doctrine. Furthermore, though its flexible in terms of the number of resources initially committed to an operation, its ability to conduct split-base operations and adapt once in theater is restricted. Though it is not a structure that the Army could adopt outright, certain aspects appear to be easily adopted and incorporated into Army echelon-III structures.

Summary. A quick review of the comparison matrix might lead one to believe that the 30-bed MASH is the solution to echelon-III hospitalization in SSC operations. However, after reviewing the advantages and disadvantages of each platform analyzed in this study, it is clear that the MASH in and of itself is not the solution. Moreover, the

results do not indicate that the 248-bed CSH no longer has a role in the AMEDD inventory. In fact, quite the opposite seems apparent to the author. The CSH possess unique and desirable capabilities particularly with regard to supporting MTW type operations.

None of the platforms studied completely possess the characteristics nor meet the flexibility, mobility, deployability, full-spectrum capability, and reduced footprint/ economy requirements associated with providing echelon-III hospitalization support to SSC operations. DEPMEDS is certainly one of the limiting factors. Under the Cold War and MF2K scenarios where the opponent with the greatest mass was expected to prevail, DEPMEDS is quite practical. It performs well with regard to the issue of mass and it has the added bonus of substantial modularity and standardization. However, DEPMEDS equipment cannot be entirely blamed for the shortfalls in the platforms analyzed. Three of the four platforms possess certain characteristic that if combined would provide the Army with an Interim Force hospitalization solution to SSC operations. These characteristics are present, in some cases, in spite of DEPMEDS. And it appears they can be modified and incorporated into a single hospital structure with limited resources. The changes that could be made now with existing resources that would enable the AMEDD to meet short-term obligations and remain relevant are presented in chapter 5 in the conclusions and recommendations sections.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This qualitative study was designed to examine the US Army Interim Force field hospitalization requirements in SSC operations and the AMEDD's ability to adequately fulfill the requirements under present and emerging conditions. The primary research question asked was: Does the US Army Interim Force need a strategically deployable, 100 percent mobile hospital that is smaller than the 248-bed CSH to provide echelon-III CHS for military operations short of a MTW? The study employed a five-step qualitative research method. Steps one and two are presented in chapter 3 and steps three through five are presented in chapter 4. In general, evidence was collected and each of the subjects were evaluated against the five criteria considered most significant for an echelon-III hospital to possess in supporting SSC operations. The subjects were analyzed separately in terms of each criterion and rated accordingly.

Conclusions

The answer to the primary research question is clearly a “yes”--a smaller, more deployable, 100 percent mobile echelon-III hospital is needed to support SSC operations. The Military Health Services 2020 Operations Other than War (OOTW) Report states,

> The period between now and 2020 promises to be an era in which OOTW [SSC operations] will be a predominant military activity, where OOTW will expand to include a variety of novel mission types, and where health-related capabilities can be an important tool for protecting our national security. A growing emphasis on OOTW will put new demands on the military health system that go beyond anything that is seriously being considered or planned for today. (1998, 2-25)

The “new demands” referred to in the OOTW report are largely represented by the five criteria found to be most critical for an echelon-III hospital to possess in order to support SSC operations: flexibility, deployability, mobility, full-spectrum capability, and reduced

footprint/economy. This study's findings clearly demonstrate these demands exceed current capabilities, but more importantly, they exceed the capabilities and functions of the MRI CSH and the other platforms analyzed here. But the most relevant conclusion to result from this study is not found in the evaluation of the four platforms, rather it is in the necessity for future echelon-III hospitals to possess the characteristic defined as criteria in this study. This conclusion cannot be overstated knowing that the AMEDD's MRI plan with regard to hospitalization fails to adequately address the characteristics required of an echelon-III hospital to support SSC operations under present and emerging conditions. Further emphasis on the significance of the characteristics is provided below.

Flexibility and Full-Spectrum Capability. Recent SSC operations emphasize the requirement for echelon-III medical units to be full spectrum capable and possess the flexibility to relocate and or provide split-base support. Possessing only non-modular, high-end surgical capability--as typical US Army platforms--in support of a peacekeeping or humanitarian assistance type mission renders a unit virtually irrelevant. The ability to tailor or task organize for a mission must be built into the structure without causing the unit to develop a derivative UTC in order to deploy. The EMEDS+25 was the only platform analyzed that possesses a sufficient degree of full-spectrum capability. Though the flexibility of the MASH exceeds the other platforms its components require minor improvements to extend their ability to function independently and take on attachments as required.

Deployability. A hospital supporting a SSC operation must be as deployable as the force it is required to support. It must have designated UTCs at small enough building blocks that enable the unit to develop standard load plans for each UTC without the threat

of having to change each one prior to deployment. The MASH and EMEDS+25 both preformed well with regard to the deployability evaluation. Their strengths in is area must be duplicated in deployable hospitals that are likely to support SSC operations.

Mobility. Footprint in many ways furthers the necessity of being capable of moving independently. In SSC operations all support units will aim to minimize their footprint. Transportation units will not have excess capacity to move hospitals. In order to stay in acceptable proximity to the force supported an echelon-III hospital must be 100 percent mobile. Mobility is clearly one of the more challenging characteristics to build into a hospital structure. Advances in technology with regard to transportation and alternatives to DEPMEDS will likely hold the long-term solution to this issue. However, for the Interim Force, mobility in echelon-III hospitals is required now. With the exception of the MASH, the platforms analyzed all lacked in mobility. And even the MASH platform highlighted the need to also address personnel mobility and not just the mobility of unit's supplies and equipment.

Reduced Footprint/Economy. The historical perspective combined with the analysis conducted for this research certainly underscores the deficiencies in the current Army hospital system. It is clear that even without Objective Force technologies the requirement exists to greatly reduce the hospitalization footprint in theater. In the deployment process medical units must compete with the movement of troops, combat materiel, and sustainment supplies. This fact drives the requirement to take only essential personnel, supplies, and equipment. Efficiency is key in reducing the footprint of a hospital. To be relevant a hospital must maximize capability while minimizing the space, resources, and aircraft it consumes.

Those critical of the past performance of echelon-III hospitals may use the conclusions presented together with the US military evacuation capabilities to argue that echelon-III hospitalization could or should be eliminated from the force mix for SSC operations. Technology advocates may claim that a facility to stabilize and prepare patients for evacuation is all that is needed. However, if structures were designed under the premise of complete reliance upon evacuation it would eliminate nearly all the requirement to build flexibility, mobility, and full-spectrum capability into an echelon-III platform. Because the weather, maintenance, and the enemy are still not completely controllable, these characteristics are essential. Clearly, relying on the unrealistic solution of implementing a zero day evacuation policy for SSC operations is analogous to assuming away the problem. Perhaps the most relevant argument for all five characteristics is a quote attributed to Tamerlane, “It is better to be on hand with 10 men than to be absent with ten thousand” (Steele 2001, 5).

This research was not intended or designed to reveal new technology, techniques, or doctrine that would or could satisfy all the hospitalization concerns for the Interim Force during SSC operations. And while none of the conclusions represent a large departure from familiar warfighting tenets, their application to echelon-III hospitalization for SSC support is perhaps new, yet clearly required. In total, these aspects appear to be more exemplary of common sense than any particular wisdom, but perhaps putting this “common sense” in one place will be of some benefit to force developers and planners. Also, this study does not constitute a comprehensive solution to the Interim Force hospitalization requirements for SSC operations. Rather, it is intended to encourage discussion and perhaps provide a point of reference for doctrine and force developers.

Recommendations

Though Steven Metz' article *23 Strategic Asymmetry* is primarily referring to combat arms capabilities, his message is pertinent to the AMEDD and hospital units. He states, “All reasonable steps should be taken to avoid dependence on any single operational method or system” (2001, 7). The AMEDD must act today in order to develop a hospitalization system relevant for all types of military operations. TRADOC was correct in saying “contemporary operational issues--warfighting needs of soldiers and units engaged somewhere in the world--take precedence over future requirements” (TRADOC 1996a, 14). Relying solely on the 248-bed MRI CSH and waiting on OF technologies to solve SSC issues is clearly a risky proposition. Consequently, the overall recommendation, if nothing else, is to evaluate and make changes to the CSH centric MRI plan that will in some way address the flexibility, deployability, mobility, full-spectrum capability, and reduced footprint/economy requirements of SSC operations.

Obviously Total Army Analysis and the budgeting processes significantly affect force development and force structure changes. These processes are time consuming and possess an inertia that often makes short term changes difficult. Consequently, affordable, near term solutions to the redesign of at least some hospitals may be all that is possible. Most of the hospitals scheduled to convert to MRI CSHs have not yet done so. Although funding is already programmed for their conversions and perhaps it may be used to implement some of the recommendation provided here. To work within the constraints listed, the author recommends converting a few of the AMEDD's deployable hospitals to a more adaptive structure than that of the MRI CSH. While it is beyond the scope of this research to design a new hospital structure, several ideas are presented that incorporate

the finding of the research. These seemingly inexpensive techniques to create adaptive hospital structures that possess an acceptable level of flexibility, deployability, mobility, full-spectrum capability, and reduced footprint/economy are listed below:

1. Infuse already existing technology into hospital platforms. Telemedicine is particularly promising technology. It can enable a unit to be more full spectrum capable even if medical professionals and equipment are not physically located with the hospital. Further, it allows an organization to possess medical capability and flexibility while reducing the footprint.

2. Design the CSH with an EMEDS building block structure. First, ensure each element in the overall structure is specified on the TOE with a separate UTC established. The core building blocks should include two identical mini-hospitals that have basic surgical and holding capabilities and primary care and diagnostic capabilities. This feature ensures flexibility and full-spectrum capability. To enhance flexibility the remainder of the overall structure should be comprised of multiple building blocks, each with separate UTCs. The MASH could be used as a starting point with regard to size for the two core building blocks, but the surgical capabilities should be about equivalent to that of a FST and the holding capabilities should start at no more than one 10-bed ICU. This would aid both in deployability and reduced footprint/economy. Additionally, like the MASH, the core building blocks should be 100 percent mobile and capable of conducting stand alone operations indefinitely. None of these ideas prevent the overall structure from being expandable to 248-beds if retaining that capability is desired.

3. Train echelon-III units to be more deployable, mobile, and flexible. Commanders and unit personnel must understand the dynamics and capabilities of a

building block type unit. It would be counter productive to design new platforms with enhanced capability and still have units "tailoring" for deployment. Without proper training units would still lack flexibility, deployability, and mobility.

Areas for Further Research

Several topics beyond the scope of this thesis presented themselves during the research for this study. These topics are significant to the force structure development of echelon-III hospitals for the Army and the joint community in all types of operations. Moreover, they are particularly relevant to the discussion of SSC operations where flexibility, deployability, mobility, full-spectrum capability, and reduced footprint/ economy are critical characteristics. First, the assumptions made in order to conduct this study require validation and are worth study themselves. Second, is there any utility in continuing to make a distinction between echelons III and IV? Certainly for SSC operations the distinction is insignificant and may only aid in confusing a tasked unit with regard to deployability and full-spectrum capability. Third, evacuation policy is critical in determining the flexibility, mobility, and footprint characteristics that an echelon-III facility must possess for any given operation. Therefore, does the AMEDD and joint community need a base line evacuation policy in order to develop echelon-III platforms? Finally, does the AMEDD and joint community need to develop a standard position concerning definitive care versus essential care in theater? This issue directly relates to the flexibility and full-spectrum capability characteristics that an echelon-III facility must possess in supporting SSCs. These areas all directly influence the decisions that force developers and planners must consider when organizing echelon-III hospitalization.

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LTC Joyce P. Dimarco
Department of Logistics and Resource Operations
USACGSC
1 Reynolds Ave.
Fort Leavenworth, KS 66027-1352

LTC Daniel J. Jones
Department of Logistics and Resource Operations
USACGSC
1 Reynolds Ave.
Fort Leavenworth, KS 66027-1352

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USACGSC
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