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MEDEVAC: A CURE OR PROBLEM

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personnel views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Abstract of

MEDEVAC: A CURE OR PROBLEM

Military medicine needs to be more mobile and flexible in the light of new challenges. Faced with anticipated reduction in medical personnel, military medicine can capitalize on the strengths of CONUS medical facilities for definitive care during conflicts. By changing the medical evacuation system to become the primary medical asset and supplementing it with in area medical assets to compensate for evacuation shortfalls will allow for more mobility and less logistical demand on the theater CINC, and still provide the needed care for casualties. Establishing echelons of care for the purpose of resuscitative care only when the expected medevac system will take longer than one hour to get a patient treated, will reduce the forward presence of unnecessary and additional medical assets. Needed reforms will increase the medical capabilities in both the theater and in the medevac system and further reduce the logistical footprint in the theater of conflict.

The post-cold war environment presents numerous challenges for the leaders of military medicine. The refocusing of current and future combat care capabilities is needed to support the highly flexible and mobile combat force that is envisioned in Joint Vision 2010. While medical combat care is currently geared for a global war scenario of annihilation and attrition, it is logistically intensive and mainly strategically mobile. Additionally, as with future drawdowns in medical personnel are anticipated, military medical leaders and planners will be challenged to provide mobile and flexible medical care during a conflict, while ensuring medical staff are prepared and trained to accomplish this task.

This paper offers a conceptual framework to adapt combat medical care policies to the Joint Vision 2010 and across the spectrum of conflict. To support the more mobile and flexible military force of the future, only medically necessary assets should be deployed to the operational theater to provide life saving measures. By establishing a medical combat care goal of preserving life and limb within one hour of injury under a new policy, patients should be medevaced out of the theater of conflict immediately after resuscitative measures are completed. Personnel with non-life threatening injuries and diseases requiring hospitalization should also be medevaced out of the theater for further definitive care. This concept for the treatment of patients will significantly reduce the requirements for in-theater medical assets and provide definitive care to patients in an area that is not threatened by hostilities. Developing and implementing this new concept of immediately evacuating patients out of theater will reduce the logistical footprint, increase combat mobility, and facilitate the massing of more of the combat forces and less medical support elements. To ensure this new concept will work, changes must be made to the current military medical system. The suggested changes should increase medical capability while reducing the competition for logistical

support at the same time.

NEW CHALLENGES

Several military documents provide a vision and direction for future combat military medicine. These documents focus on joint endeavors that will increase efficiency and effectiveness of the military force.

Joint Vision 2010 (JV 2010) provides a vision for military medicine. There are four operational concepts that that military medicine must consider: 1) dominate maneuver, 2) precision engagement, 3) full dimensional protection, and 4) focused logistics.[1] In this document, military medicine most significantly impacts on dominate maneuver and focused logistics. While JV 2010 envisions a highly maneuverable force that can respond quickly to any level of conflict mainly from the United States, the logistical support must be responsive, flexible and precise.[2,3] Military medicine will be challenged to support and adhere to these concepts.

The Medical Readiness Strategic Plan 2001 (MRSP-2001) draft, issued by the Assistant Secretary of Defense for Health Affairs (ASD(HA)) is a plan to achieve and sustain medical readiness through the year 2001 and beyond.[4] This document serves as a strategic plan to support military operations as outlined in Defense Planning Guidance for Fiscal Years 1996-2001. Additionally, the MRSP-2001 provides an avenue to measure medical capabilities in support of the Department of Defense (DoD). As a result of the plan, all sectors of DoD will have a clearer understanding of how military medicine meets their needs through supporting readiness and combat operations.

Joint Health Service Support Vision 2010-Full Spectrum Health, in a preliminary coordination draft, provides a common direction in a joint effort for medical leaders in its

endeavor to support the warfighter.[5] This document supports JV 2010 and also challenges the medical community to adapt to the changing needs of the warfighter and the current global environment.

JV 2010 has provided a vision for the military medical community. Military medicine needs to implement changes to its current readiness and combat support polices in order to provide essential requirements in a strategically and unstable global environment.

CURRENT MEDICAL SYSTEMS

Several documents and studies have addressed problems with the current combat medical capability of military medicine. Among the biggest problems identified were medical training, readiness and end-strength numbers for medical personnel, and the mobility of current deployable medical assets in support of military operations.

All the Services face the difficult situation of determining accurate numbers for medical personnel required to support two major regional conflicts (MRC). In 1991, through section 733 of the National Defense Authorization Act for Fiscal Years 1992 and 1993 (733 Study), Congress required DoD to reassess its medical personnel requirements.[6] A great deal of controversy surrounded the findings of the 733 Study and the final end strength numbers were debated by each Service. Along with the mandated 733 Study, each Service developed their own plan to determine the required number of medical personnel to maintain readiness and support for a two MRC scenario.[7] After several years of debate, there still is no agreement on the notional personnel requirements. The reality is that the Services are anticipating a projected manpower reduction in the future.

Additionally, training and readiness of military medical personnel to effectively operate in a combat situation was identified as insufficient.[8,9] One of the dilemmas military medical

leaders face is how to achieve appropriate surgically intensive combat readiness training for medical personnel while still providing peacetime medical care to active duty members and DoD beneficiaries.

The current deployable medical systems are logistically demanding and cumbersome, and most assets require a large footprint which are difficult to move, see Appendix A. JV 2010 and MRSP identified the need to lighten the current deployable medical assets, and the Services are studying ways to accomplish this task. All the Services have separately re-engineered portions of their deployable medical systems (DEPMEDS), mainly at the echelon 1 and 2 levels, to tailor assets to specific operational tasks. However, the DEPMEDS at echelon 3 and higher are still considered logistically heavy and mainly strategically mobile. They are deployable only as a complete unit and are not capable of being tailored to different levels of operational tasks.

ADAPTING MEDICAL CAPABILITIES

In light of the difficult task of maintaining adequate number of medical personnel, training them for a conflict, and the logistical demand for DEPMEDS, changes can be effectively made to increase medical capability in the theater of operations and decrease the competition for logistical support. Several changes are now underway to develop and assess medical capabilities and planning.

Under the scrutiny of the Joint Warfighting Capabilities Assessment (JWCA) which has been in effect since 1995, and the planning module Joint Operation Planning and Execution System (JOPES), the Commander in Chiefs (CINCs) have had greater input and assessment of medical requirements and capabilities.[10] Planning at this level is essential in order to determine the specific requirements for medical support in a theater of operation.

Joint Pub 4-02 (JP 4-02) outlines planning factors to be considered for joint medical operations.[11] Use of these factors will help determine the expected casualties and required medical support needed to care for injuries in an area of conflict. This planning process, as outlined in JP 4-02, primarily looks at the medical evacuation process as method of handling casualties when current in area medical assets become overloaded.[12] By changing the medical evacuation system to become the primary in theater medical asset, estimates for the remaining required in area assets to compensate for evacuation shortfalls will be determined to reduce the forward presence of unnecessary and additional medical assets.

The envisioned focus for combat care concentrates on medevacing patients out of the combat zone and the operational theater to reduce the medical logistical footprint. The position of forward medical assets should be based on consideration of threat by the enemy and the estimated time it will take to medevac a patient from point of injury to appropriate medical treatment. The CINC must consider the mobility of medical assets in relationship to the operational momentum and tempo, along with the medical care requirements for injured patients. This refocus would reduce the numbers of echelons for medical care and establish medical facilities for the purpose of resuscitative care only when the expected medevac system will take longer than one hour to get a patient treated. This requirement supports a military medical standard to treat a patient within one hour which is critical to reduce morbidity and mortality associated with illness and injury on the front line.[13] Consequently, fewer medical personnel will be exposed to hostile activities, and the reduced medical infrastructure will allow more mobility and remove some restrictions for the warfighter.

The medical facilities associated with echelon three medical care or higher are usually located in the rear of an operational area. These facilities should remain capable of providing

life and limb saving measures, as they are currently designed. The ideal location for this type of facility should be near an airfield or port so additional steps for the transfer patients to an evacuation center will be reduced. In addition to providing emergency measures, there are usually holding assets to allow for patient recovery and potentially return personnel with minor injuries or illnesses to duty. These holding assets should be eliminated, and patients who require hospitalization should be medevaced out of the theater of operations. Patients can then receive definitive care in a system that is not in a potential hostile area and in a location where a logistical system and support infrastructure is already established. This reduces the competition between the warfighter and medical leaders for critical logistical support and lift.

The establishment of revised evacuation policies will need to be reviewed for redundancy and backup options. Air evacuation is the desired method for patient movement due to speed and distance capability. However, the route for air evacuation can be exposed and vulnerable, or weather conditions may degrade air asset capabilities. Ground evacuation methods should be available based on careful assessment of the potential lack of air evacuation capability. Another medevac asset that could be employed would be the use of the amphibious assets in the area. Evacuating a patient to amphibious medical assets could be used especially when time from injury to treatment is longer than one hour using both air and land medevac assets. If amphibious assets are used, there should be plans to medevac patients off the ships as soon as possible, plus to extract patients out of the theater of hostility, and to free up the finite number of amphibious medical assets for handling future casualties.

The reduction in the medical infrastructure in the theater of operations by rapid medevac of patients out of the area has several advantages. First, the reduction of medical

assets can increase the operational tempo and momentum. Next, having fewer medical assets in theater addresses the concern of increased hostile threat to medical support services as the potential for the deployment of weapons of mass destruction (WMD) with expanding range increases.[14] Asymmetrical strategies could be employed by adversaries which includes questionable compliance with the Geneva conventions in the protection of the wounded, medical personnel, and WMD.[15,16] The generally unprotected medical forces in theater could be destroyed or made to work under threatening conditions which would degrade medical capability to provide treatment to injured personnel in theater. Reducing the medical infrastructure within the proximity of this increasing threat would allow the military medical staff and support team to operate in more ideal conditions to provide resuscitation efforts for the traumatized patient. It is difficult, if not impossible at times, to provide definitive care to patients when medical personnel are working in chemical and biological protective gear.

NEEDED CHANGES

Changes in the current medevac system will need to take place to enable the expedient evacuation of the patient from the combat zone and theater of operations. Recent changes have started to improve the command and control of the evacuation system. United States Transportation Command (USTRANSCOM) has been designated as the single manager to establish worldwide polices for the flow and care of military casualties.[17] To further improve patient care, a new program to track patients and provide data on intra and inter theater medical assets is in the initial stages of implementation. This program, which is called the TRANSCOM Regulating and Command & Control Evacuation System (TRAC2ES), is the first step to achieve Battlefield awareness of the surrounding medical assets and casualties.[18,19] The TRAC2ES program is designed to provide the matching of patients to the necessary

medical care and identifying appropriate aircraft and crew to execute the medevac.[20] Currently this system is not able to track patients in echelon 1 or 2. With newer technology to identify and input patient data, command and control will eventually reach the first levels of care on the battlefield. This is essential to coordinate the efforts of all the medical assets and casualties in the theater of operation.

Individual Services have attempted to integrate their staffs at the echelon 3 level and have experienced great difficulty with this endeavor. Joint doctrine still gives responsibility to each individual service to evacuate their wounded personnel from the front lines past the combat zone.[21] Desert Shield/Storm exemplified the difficulties of coordinating the efforts of all the medical services that were located in numerous locations in the theater. However, coordination difficulties were overcome with ingenuity with the development of a Causality Processing Unit (CPU) that was set up between Fleet Hospitals 5 and 15.[22] Incoming casualties were triaged at this unit and sent to one of the fleet hospitals depending on required services and bed availability which had a significant impact on the smooth evacuation of patients to echelons of care that could accommodate the patient.

Dedicated medevac assets are essential to expedite medical care in intra and inter theater. For operational safety, individual Services provide evacuation of the patient from the front lines. In the Marine Corps, the typical medevac is the "lift of opportunity".[23] This present problems as additional personnel to provide care to the injured Marines are usually not available. The Army has dedicated medevac helicopters that are capable of going to the front line to pick up injured patients. Providing dedicated air or ground medical assets will increase the response time to get injured service members vital medical care. These dedicated medevac assets should be coordinated by an in-theater coordination center as proposed by the new

TRAC2ES command and control concept. This is apparent from lessons learned; using conventional assets without appropriate navigation aids caused unnecessary loss of life during Desert Storm.[24] To further reduce the logistical footprint of the forward medical assets, the medevac system should bring all equipment and supplies needed to care for wounded and ill personnel in the air and not place requirements on the requesting unit to supply or escort the patients.

Medevac assets used to transport the patient out of the theater should adopt the policy of providing the needed equipment for the medevac transport, or at least provide replacements if equipment accompanies patients. This will require the consensus among the services to standardize their medical equipment and doctrine, which will be no simple task. As with inter theater movement of patient, providing the equipment or supplies patients will require will reduce the need to overstock a mobile unit to compensate for the loss of equipment or supplies to the medevac transport.

Dedicating medevac air or ground assets will be expensive especially during resource restraints and competition with the requirements to fight one major conflict. To partially compensate for the lack of dedicated assets, prepositioned retrofit kits should be available. This will allow for the conversion of an outgoing airplane to a medevac asset. It will be important to take advantage of the lift of opportunity, but only with appropriate medical equipment and trained staff available to provide the needed monitoring or care while in the air.

During Desert Storm/Shield, there was a demand for retrograde cargo space. As transportation priority is planned for cargo destined for the theater of operation, opportunities to prioritize retrograde cargo should be considered as an opportunity to use these retrograde assets as medevac assets is possible.[25] This would require coordination with

USTRANSCOM, who owns these assets. With the pending implementation of TRAC2ES and the Global Transportation network that is already in place, this coordination could be possible.

COMBAT CARE FACILITIES

In 1988, the Deployable medical system (DEPMEDS) program was started. Intended to establish a standard requirement for deployable medical facilities, each Service utilized the majority of standardized equipment to build medical facilities as identified. Unfortunately, the configuration of this equipment into a combat medical facility differed considerable in each Service. Each service tailored their DEPMEDS to meet the needs of their individual Service component. For example, the Army designed big medical facilities in anticipation of heavy casualties due to the number of troops expected to be deployed to an operational theater. On the other hand, the Air Force designed smaller facilities with the intended purpose of caring for only the combat air crews and smaller anticipated casualties in their theaters. Additionally, the Air Force medical system relies heavily on the ability to medevac patients out of the theater to reduce their medical footprint in theater. The Navy, on the other hand, designed large facilities in support of the Marines. Along with large land based fleet hospitals, they also designed two hospital ship to care for large amount of casualties when a medical footprint could not be readily or safely established in the theater of operations. This leads to the establishment of three different types of medical facilities that are not easily interchangeable among the three Services.

Currently, there are efforts in place to package and configure the DEPMEDS into smaller facilities. The problem is the three Services work this issue individually and not as a joint effort. Instead of reaching consensus on the type of design that would be compatible

with all the Army, Air Force and Navy medical assets and operational needs, it is very possible there will be three different types of medical facilities designed for use in the theater. There should be coordination among the Services and one standard established for all echelons of care.

Each service insists that they have different missions in order to justify the need for unique DEPMEDS. To compensate for this uniqueness, standardized DEPMEDS should be configured into modules. Each module would be package for separate capabilities. For example the Lab, X-ray, operating room and intensive care unit could effectively be package as separate modules. Each service then could build the DEPMEDS according to their needs and theater requirements.

The Air Force has taken this concept and has independently developed the Air Transportable Hospital (ATH). Their system is small in comparison to the larger notional medical needs of the Army or Navy. The concept of modular capability is there but limited in capacity at this time.

Force structure is a limiting factor in implementing this concept. There are three medical services with the primary mission of providing healthcare to the active duty and beneficiaries of military medicine. More coordination within the military medical services would have the synergistic effect on our capability to deliver health care in the theater of operations. The parochialism among the three medical services has limited their ability to work together, especially during a time of conflict.

Desert Shield/Storm presented many problems for military medicine. One of the major problems was the training of medical personnel for combat while at the same time providing peacetime healthcare.[26],[27] Several authors have make suggestions for improving medical

training but there are many obstacles. Reducing the medical infrastructure by relying on medevacing patients out of the combat zone would reduce the need to train as many medical personnel for combat care. With a concept of medevacing patients out of theater as soon as possible, there will be more emphasis on the personnel assigned in the area of operation, mainly echelon 1 medical personnel to be able to provide more acute medical care.[28,29] This enables advanced vital medical care to be performed until the medevac system can transport the patient to medical facilities capable of performing life and limb saving measures.

Working within the concept of medevacing patients out of the area of operation, the air medevac crews will need to be able to provide more advanced care in the air. The conditions that would save life or limb will need to be addressed before a patient can be medevaced out of the theater. When these measures are completed the patient should be placed in a medevac system. This will mean that the medevac system will receive patients that have not been monitored for changes in their conditions for an extensive period of time. This will require a change in current Air Force doctrine which requires that the patient must be stable prior to medevac. The Air medical evacuation crew will need to be able to monitor and intervene medically or surgically if necessary to preserve the patient. The benefit of this concept will decrease the needed medical beds in theater to monitor patients after surgery and decrease the medical footprint overall. Care would then be provided in established facilities away from the threatened area.

RESEARCH AND DEVELOPMENT

Ongoing research and development will enable the front line medical providers to deliver better care. New methods and equipment will bring state of the art medical care in remote areas. As mentioned earlier, this research is being done by the individual services and

not as a combined effort that would maximize resources.

One area that should be explored is the development of a smaller and more mobile hospital ship. The current hospital ship is very large and expensive to operate. In immature theaters or in situations where it would be dangerous to establish a land based medical facility, a hospital ship can be advantageous. A smaller hospital ship would be more conducive to low intensity conflicts in which there are fewer casualties expected or where it would be dangerous to establish a land based medical facility.

SPECTRUM OF CONFLICT

If the situation arises and there are multiple almost simultaneous conflicts, by having an expedient medevac policy, there would be less medical resources that would have to compete with the combat resources being transported to the other conflict. Bringing the patient to medical facilities that are out of the theater would decrease the demand on the scare lift that would be needed to logistically support multiple conflicts.

Low intensity conflicts and or special operations with low expected casualties would be hampered by bringing in medical facilities that are defenseless. Additionally, special operations generally require less visibility and bringing in and establishing medical facility would not be conducive to a low profile. These types of conflicts may be of short duration and there may not be enough time to set up extensive medical care infrastructure.

Humanitarian operations poise a difficult situation for the medical system. In Third World Countries that offer little or no health care, medical leaders have to decide whether to provide medical care to the indigenous population in the first place. The establishment of preventive health measures would definitely help in the long term in this type of situation. If established military medical facilities are setup, the local population will expect total health

care. This is a long term commitment and pulling out prematurely before the host nation, United Nations (UN) or Non-Governmental Organizations (NGOs) medical assets are built up may have a negative impression on the local population. Long term health care should be conducted by the UN and NGOs not military medicine. If UN participants are injured they should also be resuscitated and medevaced out of the country as not to set a precedence that long term care during their illness or rehabilitation will be provided in the area until they are restored to their optimal health status.

The chemical and biological environment is difficult to address by both medical and the warfighter. The use of these weapons has the potential to eliminate the medical assets in theater. In addition, working under the threat of these weapons makes it difficult for medical personnel to provide care, especially if required to perform their duties in chemical and biological protective gear. Destroying medical assets or the logistical base in theater would have significant impact on the moral of the troops and affect support of the general public.[30] This threat is estimated to be more likely in the future because it may be seen as having the greatest force degradation.[31] Medevacing patients out of theater would not expose as many medical personnel to this threat and care could be given in a safe environment.

The chemical and biological environment presents one of the most difficult situations in establishing policy for the care of contaminated injured personnel. Difficult decisions must be made regarding their treatment and subsequent medevac out of the theater of operation to definitive care. The potential risk for spreading the contamination must be addressed. This is a situation that needs to be carefully thought out, for it will have significant impact on the troops and the general public as the expectation my exist that these wounded personnel will be given all required medical attention and treatment.

Medical personnel need training and better equipment to detect and care for contaminated patients. Current doctrine states that contaminated personnel should be decontaminated prior to being brought into the medical facility. If a patient is accidentally brought in that is contaminated, doctrine needs to be established to deal with this situation. Issues surrounding closure of the facility and routine business practices must be examined to establish procedures for personnel who may be faced with this situation.

Many problems are presented when chemical and biological weapons are a threat. Establishing a policy of evacuating patients out of the theater will reduce the threat to medical personnel and enable care to be given in a safe environment free from the restrictions that personal protective gear presents.

CONCLUSION

Military medicine needs to be more mobile and flexible in the light of new challenges. Faced with anticipated reduction in medical personnel, military medicine can capitalize on the strengths of CONUS medical facilities for definitive care. By changing the medical evacuation system to become the primary medical asset and supplementing it with in area medical assets to compensate for evacuation shortfalls will allow for more mobility and less logistical demand on the theater CINC and still provide the needed care for casualties. Establishing echelons of care for the purpose of resuscitative care only when the expected medevac system will take longer than one hour to get a patient treated, will reduce the forward presence of unnecessary and additional medical assets. Reforms suggested will increase the medical capabilities in both the theater and in the medevac system and further reduce the logistical footprint in the theater of conflict.

Wartime Medical Requirements:
Lift and Sustainment Requirements

Lift and Sustainment Per Hospital

Hosp	Beds	Personnel	S/Tons	Lift Equivalence C-17/ROR0/Flat Beds	Acres (<2% grade)	Fuel K Gal/Day	Water K Gal/Day	Cost/Yr
CSH	296	604	933	21 / 176 / 138	30	12	26	$3M
MEH	504	440	687	16 / 125 / 118	35	11	11	$2M
Gen	475	778	931	21 / 168 / 168	40	18	36	$3M
Fleet	500	1131	1054	88 / .5 / 836	28	11	24	$3M
TAH	1000	1204	UNK	NA	NA	NA	NA	$112M
Cont	500	760	1553	NA	40	42	22	$2M
AtH	50	131	127	5 / 018 / 22	1	0.7	6	$.303M

NA - Not Applicable

SOURCE J-4

NOTES

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