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Medical Support for Future Combat No More Vietnams

Lieutenant Commander Paul W. Lund, MSC, U.S. Navy

DURING THE PAST FIFTY YEARS, progress made by the American military establishment to provide sophisticated and effective operational medical care has been remarkable. The start and early development of the principles of modern combat casualty management occurred during World War II. Progress continued during the Korean war and accelerated during the Vietnam conflict, where an unprecedented ninety-eight percent of all wounded who safely reached a field hospital, survived.¹ Along with this progress, American military commanders have come to rely increasingly upon medical care resources being available and capable when and where needed.

The Vietnam medical support experience, which has been described as “the halcyon days of American military medicine,” provided the basis for many medical support planning assumptions that have been made by the Department of Defense (DoD) over the past two decades.² These assumptions and related medical support doctrine have remained relatively unchallenged and unchanged. The same can not be said, however, about the projections concerning the nature and characteristics of future combat. The question must be asked, then, can medical support planning assumptions and doctrine that were successful under the conditions of the Vietnam conflict pass the test of future combat conditions?

In my opinion medical support doctrine, due to its nature, that of general guidance, remains relatively sound and useful. However, the manner in which the doctrine may be applied in future combat situations must be reexamined.

The purpose of this study is to examine medical support doctrine and assumptions in light of the changing characteristics of combat. First is a brief description of why medical support provided during the Vietnam conflict was so successful. Second, current medical support doctrine and several important assumptions about medical support are reviewed. Third, the nature and

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characteristics of future combat are predicted. A discussion and analysis is then presented concerning whether medical support doctrine and assumptions will meet the expected challenge of the future combat environment. Finally, where medical support assumptions are shown to be lacking, recommendations for improvement are given.

Vietnam: Unsurpassed Medical Support

The United States set new standards of operational medical support during the Vietnam conflict. The care of the wounded in Vietnam was superior to that given in combat anywhere, at any time.³ Many factors accounted for this result, and those described below were the most important.

Battlefield Control. Timely evacuation of the wounded is of paramount importance to effective medical support operations. Although the United States may have lost the conflict, we generally "owned" the battlefield. A former army surgeon general with extensive Vietnam experience stated: "We would literally stop the war over there, bring the helicopter in and pick up whoever it was, take them away and start shooting again. We owned the air and could do as we pleased most of the time."⁴

Control of the Vietnamese battlefield, which made rapid patient evacuation a reality, was based upon several factors: command of the air and sea; fire superiority; uninterrupted radio communications; episodic battle; plenty of helicopters; relatively low casualty levels; and an enemy that lacked shoulder-mounted homing missile-type weapons.⁵ Aeromedical evacuation of patients became so successful that it became the evacuation medium of choice for the first time in history.

Medical Treatment Facilities. Vietnam was the setting of a number of excellent military hospitals, both ashore and afloat. These hospitals were capable of providing the finest care in every branch of medicine and surgery. The Vietnam combat casualty was treated, in most cases, at a superbly equipped military hospital comparable to, or more often surpassing, the best civilian hospital trauma centers.⁶ Although unfortunate from an offensive military point of view, the static defense posture in which the U.S. military found itself much of the time in Vietnam provided significant medical support benefits. The situation allowed construction of essentially permanent hospital buildings. Moreover, these hospitals were as near to the battle area as any military hospitals have ever been in time of war. Being "close to the action," coupled with an efficient aeromedical evacuation system, meant that casualties were usually no more than a half-hour away from definitive hospital care once on board the helicopter.

Hospital Ships. The Vietnam conflict was ideally suited for the operation of hospital ships. U.S. control of the sea was totally unchallenged. The geography of Vietnam presented a narrow land area with a long coastline. These factors allowed a hospital ship to move with impunity along the coast and offered great flexibility when responding to the tactical situation ashore. As the aeromedical evacuation process became routine, hospital ships became an important casualty treatment asset to operational commanders.⁷

Furthermore, hospital ships provided an excellent environmentally controlled haven for those who had been wounded, resulting in low infection rates. Lower post-wound morbidity rates meant significantly lower mortality rates than in any previous war.⁸

Logistical Extravagance. The unthreatened sea and airborne logistical support provided to American forces in Vietnam was especially significant concerning health care delivery. In 1968, a senior army general stated after returning to the United States from Vietnam: "Our hospitals in Vietnam are not evacuation hospitals, surgical hospitals, or field hospitals. They are more than that and consequently require sophisticated equipment. . . . We are all interested in providing the best care possible. At present we have many items of equipment in Vietnam that equal what you have at Walter Reed."⁹

Although during the early period of U.S. involvement in Vietnam there were some medical supply deficiencies, it did not take long to achieve a state where there was "almost no limit to the equipment provided."¹⁰

Also, the Vietnam conflict saw the incredible expansion of an effective and efficient whole blood system. From a demand of less than 100 units per month in 1965 to 8,000 units per month in 1966, peaking at 38,000 units per month in 1969, rarely did the demand exceed supply.¹¹ The operation of a relatively secure and unthreatened central blood bank at Cam Ranh Bay was instrumental in a highly successful blood management system.¹²

Casualty Prioritization. Favorable operational and logistical factors altered the way in which casualties were prioritized for treatment. Traditional wartime casualty management practices emphasized treating the less severely wounded first, in order to facilitate their return to battle. Those with severe wounds had in the past, in many cases, been left to die for lack of evaluation and treatment assets. In Vietnam, great effort and expense were often expended for the hopelessly wounded or maimed. In some cases, tactical missions were diverted and "several lives were often lost to save one."¹³ The Vietnam conflict environment was one in which American civilian standards of care (i.e., top quality care for *all* patients) were transferred to a theater of combat. Adding to this were important advances in the general practice of medicine that were made at the

time. Physicians, most of whom had been drafted, saw little reason to change their civilian-oriented approach to patient care.

Theater Evacuation Policy. For the first time in the history of war, the decision whether to evacuate a casualty out of theater was usually based upon medical criteria. Evacuation was seldom dependent upon purely military reasons.¹⁴ The use of medical criteria to decide evacuation moves and the availability of jet transportation back to the United States decreased mortality rates and allowed long-term life, limb, and function-threatening wounds to be treated more effectively in a true convalescent setting.

Preventive Medicine. Improved preventive medicine techniques and increased emphasis by operational commanders to control non-battle injuries were very effective during Vietnam. For example, the malaria rate among army personnel averaged out to be about one-fourth of that seen in World War II.¹⁵ Although the disease rate among U.S. servicemen in Vietnam was still considered a problem, the fact that it was at a historical low for combat situations was a remarkable achievement. Thus, disease never became a “war-degrader” as it had in most previous conflicts.

Medical Support Doctrine and Assumptions

Objective and Principles. At the present time, DoD does not have written joint medical doctrine *per se*.¹⁶ However, the common base of medical support knowledge and experience that has developed over the years among the armed forces departments, can be subsumed into one overarching objective. That aim is to return military personnel to duty as soon as possible after functional health is restored.¹⁷ This aim is to be accomplished by following six general principles, which are:¹⁸

Conformity and Responsiveness. Medical support must be in step with and complement operational plans and actions. Moreover, medical support must act in unison with the commander’s concept of operations by providing care and treatment at the right time and place. The assumptions are that medical authorities are fully aware of the operational plan and situation, and that the medical units react to the tactical or operational situation without imposing the need for the operational commander to react to the status of the medical support situation.

Flexibility and Mobility. Medical support must be able to adapt to changing military requirements. Alternate plans for redistribution of medical support resources must be made and implemented as required. The assumptions are that medical units fully recognize their support role and that the medical units are relatively easy to move.

Continuity. Providing care and treatment in an uninterrupted manner is essential to good patient care. Continuity in care is accomplished by moving the patient through a progressive, phased system from the location where the casualty is inflicted to an area as rearward from the combat area as the patient's condition requires. The assumptions are that the patient evacuation system will be available without interruption and that there will be a rear area that is secure and medically capable.

Economy. Medical support must be provided with a low resource consumption rate. This principle must be weighed against other medical principles to achieve a balance appropriate for patient care needs. The assumption is that medical supplies are limited.

Attainability. Medical units must provide the essential health care services needed to support combat operations. Although it is difficult to describe medical support in a "minimum essential" context, effective medical support can only be accomplished through careful planning that parallels the operational planning effort. The assumption is that if properly trained health care personnel, equipment, and supplies are available, effective medical support will result.

Sustainability. Medical support must be provided with long-term objectives and requirements in mind. Sustainability is achieved by providing a complete range of medical treatment options for extended periods of time within an area of combat operations. The assumptions are that medical support will be a relatively safe and secure operation with an uninterrupted logistical and transportation conduit to non-combat areas.

Echelons of Care. The second area of medical support doctrine is the concept of providing different phases or "echelons of care."¹⁹ There are five general echelons which can give increasingly sophisticated levels of care. The following table graphically displays the resources and levels of care of each echelon. The concept of echelons of care is intended to be fluid and to meet the operational conditions and needs of the patient. No patient should go farther to the rear than his or her condition warrants or the military situation demands. Also, patients should be evacuated directly to the echelon that will provide the care needed in order to expedite return to duty. The assumption is that there are adequate transportation resources and command, control, and communications systems available to get the patient where he or she can receive the appropriate type and amount of care.

Triage. The third area of medical support doctrine is the concept of triage. "Triage," a French word meaning to "divide into three," is the process of separating patients into three groups according to wound severity. The patient triage process is used throughout the world by civilian medical authorities when dealing with large numbers of casualties. Basically, one group would be that judged able to survive if immediate medical or surgical intervention were given,

Echelons of Military Medical Support

Echelons	Levels of Medical Care	Resources
Echelon I	First Aid Emergency Medical Care	Self/Buddy Aid Airman/Medic/Corpsman Aid Station Shipboard Medical Officer
Echelon II	Initial Resuscitative Care Surgical and Medical Resuscitation	Medical Company Shipboard Surgical and Holding Capability
Echelon III	Resuscitative Care	Hospital Ship Combat Zone Hospital Rapidly Deployable Medical Facility
Echelon IV	Definitive Care	Communication Zone Hospital Overseas Medical Treatment Facility
Echelon V	Restorative Care Rehabilitative Care Convalescent Care	CONUS Military Hospital Veterans Administration Hospital Civilian Hospital

one group that could wait without undue harm, and one group with wounds so severe that notwithstanding any care that could be given, death would be likely.

Shortly after Nato was established, the concept of patient triage was adopted for use by American and British military medical authorities. The concept was expanded, however, to include four categories. These categories are:

- Immediate: Patients who need immediate treatment to save life or limb.
- Delayed: Patients who, after emergency treatment, can have major definitive procedures delayed.
- Minimal: Patients who need simple treatment and can be returned to duty soon thereafter.
- Expectant: Patients who have massive injuries and little chance of survival even if major medical resources and alternatives are available. These patients are treated only after all other patients have received appropriate initial care.

Experience and Knowledge. Finally, undergirding of medical support doctrine is an assumption that there will be a sufficient number of properly trained health care professionals to render the care needed. These professionals are assumed to be involved from the deliberate planning stage of military operations to the actual delivery of health care after hostilities have commenced.

The Nature and Characteristics of Future Combat

Although each war has been unique, and future wars will continue to be different, the degree of difference will likely expand. It is probable that combat of the future will be radically different from anything experienced in the past. Future mid and high-intensity combat scenarios will probably exhibit the characteristics described below.

Battle Area Enlargement. Future battle areas will cover greater amounts of land, water, air, and time. The distinction between front and rear lines, and close and deep operations, will blur.²⁰ Increases in the range of weapons will complement a desire to attack indirectly and deeper into enemy territory. Improvements in detection methods will allow combat to be prosecuted almost anywhere, anytime, and under most weather conditions. The new “transparency” of the battle area will reduce the opportunity for warriors to rest or hide. Indeed, the future battle envisages combat actions to depths that will encompass entire nations simultaneously.²¹

Increased Lethality. Tomorrow’s combat will be, bullet for bullet, more deadly than ever before. Significant increases in the accuracy and destruction potential of weapons, particularly artillery systems, have been made.²² A senior Soviet defense official, commenting upon modern weapons, said: “Military actions can now be conducted with conventional means in qualitatively new and incomparably more destructive forms than before. The creation of new means of armed conflict with great destructive force . . . is sharply changing the nature of war . . . and its consequences.”²³

Not only has the destructive potential and efficiency of traditional weapons been increased, but new types of weapons have been developed. Furthermore, the number of nations and groups that possess these improved and new weapons has also increased significantly. The chances are great that U.S. forces may face foes who have weapons as good or better, both in quality and quantity, than American weapons.

“Star Wars” Technology. Technology that ten years ago was assumed to be many decades away is with us today and has manifested itself in the instruments of war. For example, the use of laser technology has increased the potential for surprise and accuracy—both in time and space—to such an extent that there is significantly less time available for defensive measures to be taken.²⁴ The quality and simplicity of small, shoulder-mounted homing missile-type weapons has increased greatly. Remote sensors now permit commanders to detect accurately and engage opponents at ranges longer than ever before.²⁵ Naval forces, even transiting hundreds of miles away, can be targeted and hit with a degree of

confidence never before imagined.²⁶ Also, improvements in the velocity of weapons have elevated many weapons into the “hypervelocity” category. Hypervelocity has not only decreased warning time but has also increased destructive potential.²⁷ Overall, the rate at which new technological achievements will continue to improve and enhance war-fighting tools is expected to accelerate.

The Rise in Importance of Logistics. As combat areas become larger and weapons become more accurate and deadly, logistical support requirements will also undoubtedly increase. A typical field army during World War I consumed sixty-five tons of supplies each day. That factor increased to 675 tons during World War II, to 1,000 tons during the Vietnam conflict, and 2,000 tons during the 1973 Arab-Israeli conflict.²⁸ The increase in support requirements will force operational commanders to rely more than ever upon logistical lines of support. The increased reliance will make logistics lines more significant as targets for the enemy. As logistical lines increase in value, their vulnerability and the degree of difficulty of sustainment will also rise.²⁹ Commanders will no longer be able to assume that there will be an endless supply of everything.

The Pace of Battle. Future combat is likely to be faster and require greater mobility than ever before. Operations will be continuous. The level of disorder of future combat operations will also increase, straining the ability of armed forces to respond to changing battle conditions.³⁰ Operational commanders will be required to emphasize the necessity for compromise, innovation, and flexibility.

Medical Support Doctrine and Future Combat

From a medical support point of view, the Vietnam conflict was an aberration and represented the “golden age of military medicine.”³¹ Golden ages can rarely, if ever, be duplicated and so it will probably be with medical support of future mid and high-intensity combat.

The increased size of the combat area will place challenges upon the medical support system. Larger battle areas will probably result in greater dispersal of forces than ever before. In order to provide close support to fighting forces, medical units will need to be dispersed as well. Medical support doctrine principles of responsiveness and mobility will be put to the test. Medical commanders will need to be fully integrated in the operational commander's decision-making process both at the operational and tactical levels of war. Large, semi-permanent, or otherwise unwieldy medical treatment facilities may turn into liabilities from an operational standpoint. On the other hand, the value of highly mobile medical treatment facilities, such as hospital ships, will increase.

Unfortunately, the economies of scale traditionally achieved by larger medical units will not be possible in a dispersed combat area.

Larger combat areas, coupled with weapons of increased range and accuracy, will reduce or even eliminate communications zones or other rear area sanctuaries previously enjoyed by support forces such as medical units. Moreover, weapons of increased range and over-the-horizon capability will reduce the need for "shooters" to see their targets personally. Chances will increase that medical units will be targeted due to their large radar profile no matter how many red crosses are shown. As risk to medical units increases, their ability to attain full health care treatment potential will decrease.

Modern and yet-to-be-developed electronic warfare systems are likely to impact negatively upon communications systems. An unhindered ability to communicate is a vital link in managing the patient evacuation process. Degraded or interrupted communications networks may mean that unexpected numbers and casualty types of wounded personnel may arrive at medical treatment facilities. Patients may need to be moved more than once to find a medical unit capable of providing the level and amount of care needed. Not only will patient movement requirements tax limited transportation assets, but increased patient movement will mean rises in mortality rates.

American air superiority will become increasingly difficult to guarantee. Lack of control of the skies will seriously hamper aeromedical evacuation of casualties. Casualties may reach medical treatment facilities many hours and even days after being wounded. Many wounds will be infected rather than merely contaminated—"a difference which totally alters the surgeon's approach to a wound and a patient's chances for uneventful recovery."³² Helicopters, by far the best means of moving patients, are relatively easy targets. Even if the combat risk to helicopters is manageable, the availability of enough helicopters to allow the luxury of missions devoted to aeromedical evacuation is questionable.³³ Operational commanders may need to develop evacuation alternatives emphasizing ground transportation, and also to struggle with the possible need to position surgical capable medical units closer to the fight. Even worse, operational constraints may dictate that evacuation can not be accomplished at all.

The type and number of casualties will be greater than ever before. Although casualty estimates by DoD are classified, a former director of logistics on Nato's international staff has said concerning high-intensity future combat: "[casualties] could be summed up in a word. 'Horrendous.' The sheer intensity of the combat will produce almost as many mental casualties as actual wounds."³⁴

Wounds such as those from combat are rarely seen and treated by most American physicians, even if the physicians are on active military duty. Although combat casualty care is rooted in basic surgical and medical principles, specialized knowledge and experience is needed to transfer these principles into military operational realities. In other words, "war surgery is not synonymous with

civilian trauma management.”³⁵ Medical commanders will face the task of overcoming the civilian-oriented peacetime training, which will be deficient in the heat of battle, of their physicians and nurses.

If unconventional combat instruments such as chemical weapons are used, the compounding of wound damage will increase. A recent review of Vietnam conflict wounds determined that almost thirty-four percent of those wounded by conventional means were wounded in such a way that chemical warfare protection devices, had they been necessary, could not have been properly used.³⁶ The obvious result here would be significantly increased mortality rates. Also, if medical units came under the same type of unconventional attack, their efficiency and effectiveness would decrease dramatically.

Preventive medicine measures could also be degraded due to lack of battle area control and the possible employment of biological weapons that disperse new disease strains with unknown antidotes. The result will be a rise in non-combat disease and death rates.

From a logistics point of view, the ability of medical units to sustain operations in a flood of severely wounded casualties is likely to be reduced. Enemy pressure upon supply lines will slow the flow of medical supplies. Not only will the logistics flow to medical units be in jeopardy, but the medical units themselves, as part of the overall logistics and support system, may be targeted by the enemy. Enemy pressure can be expected at any point in the future combat area. Rear area security doctrine, if there is any sort of rear area, will need to be improved. Medical units may be forced to use their own personnel to provide security if all non-medical forces are needed at other locations. This would further degrade medical support capabilities.

Finally, a true Nato-style patient sorting system will need to be used. Future combat may very well demand that a greater proportion of the wounded be categorized as “expectant.” Due to limited supplies, reduced capabilities, and constraints caused by the expected realities of future combat, medical decisions will probably be made on the premise of the greatest good for the greatest number of people. This premise will directly challenge the healing profession’s traditional philosophy of treating all patients equally, at maximum levels of resources, as well as American political demands that every wounded fighter receive care sufficient to preserve life.

Conclusions and Recommendations

For future conflicts, operational commanders can not rely upon medical support results that were seen during the Vietnam war. The military conditions there were such that the principles of medical support doctrine were easily

employed with excellent results. The American tradition of providing care for the wounded in time of war was significantly reinforced. Future combat conditions are unlikely to be so generous; it would be irresponsible to assume otherwise. Planning for combat health care delivery should still focus on adherence to the principles contained in current medical support doctrine. These principles, due to their general nature, allow the greatest flexibility and embody the collective wisdom gained from past conflicts. However, the recommendations that follow are intended to adjust the application of that doctrine to serve anticipated future combat conditions.

- Codify joint medical support doctrine. As with all other aspects of future combat where joint operations will be the order of the day, medical support operations should be planned and conducted under an umbrella of joint doctrine. Medical support doctrine held by the individual service departments provides an excellent basis on which joint doctrine could be created by the Joint Staff.

- Improve mobility and responsiveness. As combat units disperse to meet expanding modern battle threats, medical units will need to follow. The utility of having too many medical resources tied up in large, difficult-to-move, 500 to 1,000-bed field hospitals must be reconsidered. In most cases, individual medical units should be downsized, made lighter, and be given more mobility to get them closer to where the fighting is taking place. At the same time, more of these smaller yet mobile units should be organized. Medical unit capability should also be expanded by taking advantage of engineering advances that make medical equipment smaller, easier to maintain, and able to accomplish an expanded array of functions. Moreover, although the two hospital ships now in the inventory represent the most important medical support enhancement made during the past two decades, additional smaller and faster hospital ships should be considered.

- Integrate medical planning factors with operational considerations. Medical support relationships must be clearly defined and understood by both medical units and the units which they support. Operational commanders must be continuously aware of medical support requirements and limitations, as should medical commanders be constantly aware of operational conditions.

- Add medical support doctrine to line officer professional military education curricula. Too often in the past, knowledge of medical support capabilities and limitations has been left to the medical department. Although this may suit health care delivery given at a "medical tactical level" (i.e., the actual rendering of care), potential operational commanders need to receive knowledge of medical support assets at the operational level. Conversely, medical department officers, particularly physicians, should be represented from year to year as students at professional military education institutions.

- Improve and expand combat casualty care training. Military health care professionals must expand upon the traditional academic “healing arts” education to cover its application in a combat setting. This will be done only with great difficulty due to the civilian-modeled, dependent beneficiary treatment orientation approach now institutionalized. Health care personnel must also be better trained in patient sorting skills. Not all wounded will survive, and medical care resources must be directed to those cases reasonably expected to be restored to functional health. Also, the medical training and awareness of non-medical personnel should be expanded and enhanced. Traditional first aid and self and buddy aid concepts are vital and should be the foundation on which to build more knowledge about cardio, pulmonary, resuscitative, and preventive medicine skills among all war-fighters. Furthermore, hospital ships should be used not only during contingencies but during peacetime as well. Although it is likely that peacetime patients would not present combat-like wounds and conditions, military medical departments would benefit greatly from their personnel working in an operational medical treatment facility.

- Improve ground transportation methods for patient evacuation. Reliance on aeromedical evacuation methods, particularly helicopters, must be reduced. More ground ambulances with improved suspension and load capabilities should be provided. New types of faster non-helicopter evacuation methods, such as hydrofoil or air cushion vessels, or vertical and short take-off aircraft are required.

- Enhance logistics line security. The ability to provide needed medical supplies to all points on the battlefield will be vital. Commonly covered under the heading of “rear area security doctrine,” the concept should be changed to “logistics security doctrine.” An unhindered medical logistics flow may be as important to the operational commander as the supply of ammunition or food. On the other hand, medical department personnel must improve security awareness and practices, and learn to operate (literally and figuratively) under austere combat conditions where their treatment decisions have impact upon the accomplishment of the mission.

A Final Thought

The well-known maxim that “plans should not be made to fight the last war,” applies to medical support. Medical support plans must take into account the likely characteristics of future mid and high-intensity combat. If this is not done, the consequences may be devastating—not only to the operational commander who may be constrained from achieving military goals but also to the medical commander who may be frustrated in the quest to preserve combat strength efficiently and effectively.

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