CHAPTER IV

Hospitalization and Evacuation

The peculiar nature of counterinsurgency operations in Vietnam, required modification of the usual concepts of hospital usage in a combat area, There was no "front" in the tradition of World War II. The Amy checkered the countryside with base camps. Although any one of these might become a battlefield, the base camp was relatively secure unless it was under attack. Semipermanent, air-conditioned, fully equipped hospitals were constructed at a number of these camps. In contrast to World War II and the Korean War, the hospital did not follow the advancing army in direct support of tactical operations. All Army hospitals in Vietnam, including the MUST (Medical Unit, Self-contained, Transportable) units, were fixed installations with area support missions. Since there was no secure road network in the combat area of Vietnam, surface evacuation of the wounded was almost impossible. Use of the five separate companies and five detachments of ground ambulances sent to Vietnam was limited largely to such functions at base camps as transportation between the landing strip and the hospital or the routine, transfer of patients between neighboring hospitals when roads were secure. Air evacuation of the injured became routine.

Getting the casualty and the physician together as soon as possible is the keystone of the practice of combat medicine. The helicopter achieved this goal as never before. Of equal importance was that the Medical Department was getting the two together in a hospital environment equipped to meet almost any situation. The degree of sophistication of medical equipment and facilities everywhere in Vietnam permitted Army physicians to make full use of their training and capability. As a result, the care that was available in Army hospitals in Vietnam was far better than any that had ever been generally available for combat support. The technical development of the helicopter ambulance, a primitive version of which had been used to a limited extent in the Korean War, the growth of a solid body of doctrine on, air evacuation procedures, and the skill, ingenuity, and courage of the aircraft crewmen and medical aidmen who put theory into practice, in a hostile and dangerous environment made possible the hospitalization and evacuation system that evolved in Vietnam. The system worked effectively because it was compatible with the characteristics of warfare in that country.

Until April 1965, the 8th Field Hospital at Nha Trang with a 100-bed capacity was the only U.S. Army hospital in Vietnam. Housed in fixed semipermanent quarters, the 8th Field was fitted with a combination of field and "stateside" equipment and operated in a manner similar to a station hospital. Attached to it were four medical detachments which provided specialty care but were totally dependent on the hospital for administrative and logistical support.

In October 1961, the Navy opened a dispensary in Saigon which removed that city, as well as III and IV CTZ's to the south, from the hospitalization responsibility of the 8th Field Hospital. It remained responsible only for the large area encompassed by II CTZ.

Because of the limited number of Army hospital beds in Vietnam to support, the buildup of US combat forces in 1965, a variable 15- to 30- day evacuation policy was established by the Surgeon, USMACV. By mid-1966, the number of beds, had increased sufficiently to permit a change to a 30-day policy. Patients who could be treated and returned to duty within 30 days were retained in Vietnam; patients requiring hospitalization for a longer period were evacuated out-of-country as soon as their medical condition permitted.

In the development of the medical troop list, the length of the evacuation policy did not weigh as heavily as the patient treatment capability required in-country. Among the factors which affected the normal book planning of allocations were the lack of data on the number

and types of foreseeable casualties in counterinsurgency operations, the insecure ground lines of communication, and the wide separation of secure base areas. No single factor had as great an influence in determining the number of hospital beds required as the policy approved by USMACV to keep 40 percent of the operational beds available to support unexpected surges in the casualty flow resulting from hostile actions. The occupancy rate exceeded 60 percent on two occasions: during May 1967 when it briefly approached 67 percent, and for a 24-hour period during the Tet Offensive in February 1968, when it again increased to more than 65 percent.

Between April 1965 when the 3d Field Hospital arrived in Saigon and December of that year, two surgical hospitals, two evacuation hospitals, and several numbered field hospital units, which were initially colocated with the 8th Field Hospital in Nha Trang and the 3d Field Hospital in Saigon, were deployed to Vietnam. By the end of 1965, the total number of hospital beds in-country had increased to 1,627.

Throughout 1965, separate clearing companies were at times used interchangeably with hospitals. Augmented by specialty teams, platoons

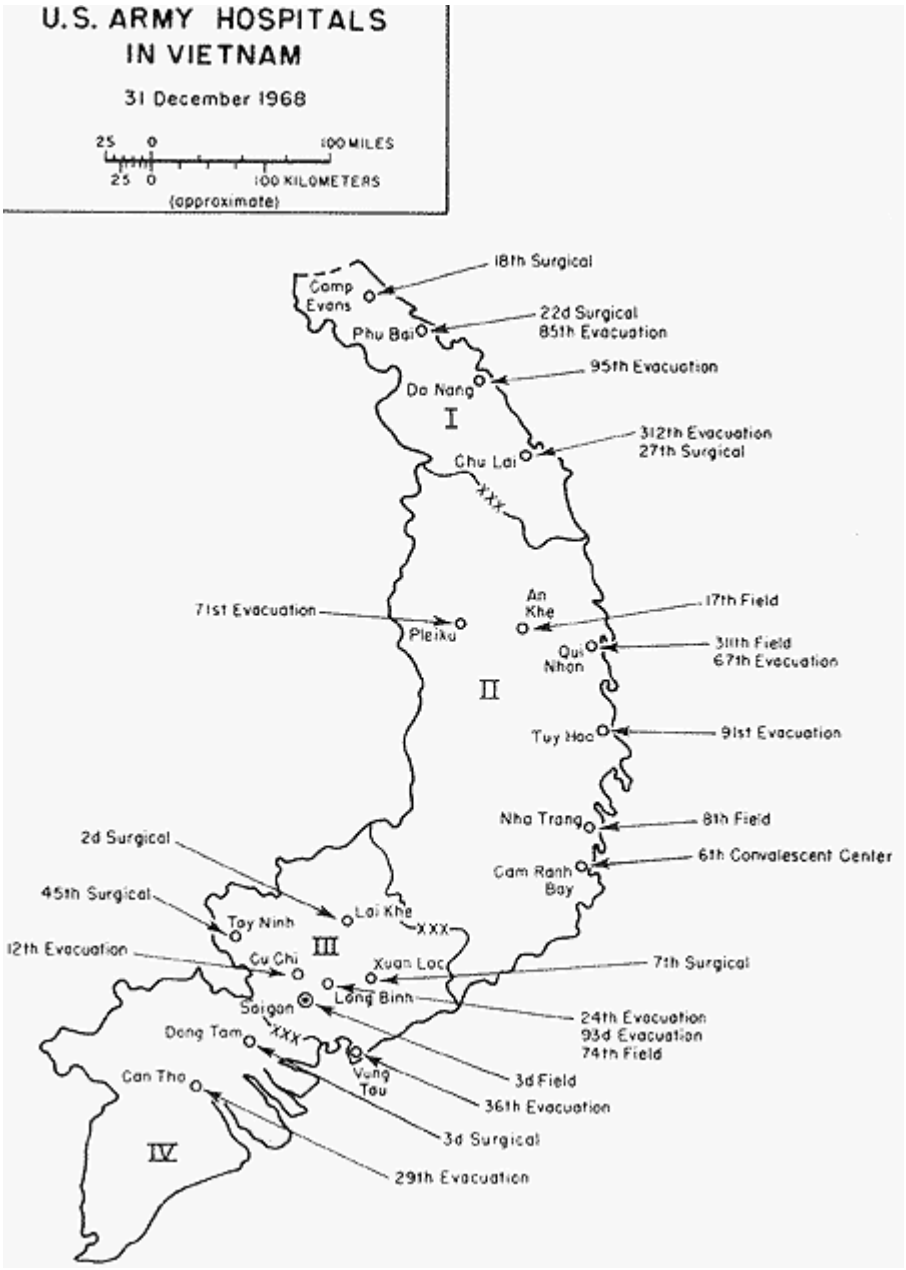
of these companies often preceded or supplanted hospitals, providing limited care within an area until more adequately staffed and equipped units arrived. Field-army-level clearing units were also used to augment hospitals and provide additional bed space. Dispensaries sometimes supplemented the resources of major hospitals and at other times provided outpatient service in remote areas.

The deployment of additional hospitals to Vietnam continued throughout 1966 and 1967. During 1966 and 1967, four surgical hospitals, six evacuation hospitals, and another hospital unit of a field hospital arrived in-country. The 6th Convalescent Center was established at Cam Ranh Bay.

The buildup of medical units was completed in 1968 with the arrival of one surgical hospital, three evacuation hospitals, and additional field hospital units, as well as 11 Reserve and National Guard medical units. The 312th Evacuation Hospital, the largest Reserve medical unit sent to Vietnam, arrived in September 1968, and occupied a facility the 2d Surgical Hospital had operated at, Chu Lai. By December 1968, there were 5,283 Army hospital beds in Vietnam at facilities located throughout the four corps tactical zones. (*Map 2*)

With the exception of the 2d Surgical Hospital which moved from An Khe to Chu Lai on 8 May 1967 to support Task Force OREGON, the, movement of hospitals was minimal before 1968. The problems encountered by the, 22d Surgical Hospital in its move from Da Nang to Phu Bai were illustrative of the difficulties of moving medical facilities in the Vietnamese environment. The hospital was moved by LST (landing ship, tank) from Saigon to DA Nang. Enemy activity closed the road between DA Nang and Phu Bai, stranding the unit for several days while it awaited air transportation. The number of sorties required to complete the movement resulted in an even further delay.

The policy which called for minimal movement of hospitals was modified somewhat in 1968 and, to a greater extent, in 1969. The 22d Surgical Hospital and other medical units were sent to Phu Bai. The 18th Surgical Hospital was moved to Quang Tri, to Camp Evans, and back to Quang Tri. The 17th Field Hospital departed Saigon to operate in An Khe. The 27th Surgical Hospital was sent to Chu Lai after it came in-country, while the 95th Evacuation Hospital functioned in two different parts of DA Nang. The 29th Evacuation Hospital was established at Binh Thuy to support operations in the Delta, but was later deactivated and its facilities taken over by the 3d Surgical Hospital after it had moved from Dong Tam. The 91st Evacuation Hospital went to Chu Lai after the unit had built a facility near Tuy Hoa. The 85th Evacuation Hospital departed Qui Nhon for Phu Bai.



Among other moves, the 2d Surgical Hospital remained temporarily at Chu Lai, then selected personnel deployed to Phu Bai to operate a 100-bed US Army hospital (provisional) in facilities previously operated by the Marines. The provisional hospital was opened to retain the real estate and provide continued medical coverage in Phu Bai until a larger hospital could be constructed. When the 85th Evacuation Hospital took over in Phu Bai, the 2d Surgical Hospital moved to Lai Khe.

To a certain extent these moves, were made to support increased Army combat activity in I CTZ and elsewhere, but they were not in support of tactical operations in the tradition of World War II and the Korean War. Except for the interim use of MUST equipment or existent buildings, the moves were made into semipermanent construction and were far more deliberate and complicated than the movement of tent-housed hospitals in previous conflicts. To a far greater extent shifts in 1968 and 1969 were the result of the deactivation of units and the consolidation of areas of support.

Construction

The construction of a modern hospital is a lengthy and complicated process. Line officers, medical staff planners, and hospital commanders soon found that many time-consuming, frustrating problems had to be resolved before construction could start.

Real estate was generally acquired in large sections for military use and then parceled out to the units needing it. Negotiations for a hospital site were often protracted. For example, the need for an evacuation hospital in the Pleiku area was recognized long before the area was secure enough to permit construction. Meanwhile, the original allocation of land for this use had been lost, and new negotiations were opened, with the commander of the Vietnamese II Corps and the US Air Force. It was some time before an agreement for suitable land was again reached and the contractor could begin work on the 71st Evacuation Hospital.

Hospitals were built in a wide variety of configurations, and construction was accomplished in almost as many ways as there were hospitals. Some structures, for example, the 91st Evacuation Hospital at, Tuy Hoa, were, built almost entirely by medical personnel with some technical advice from the Corps of Engineers. Medical personnel were started by contractors and finished by the Corps of Engineers. Medical personnel did some phase of the construction work in almost all the hospitals, but, some work by contractors or engineers was needed in almost all cases to put in wiring, electrical fixtures, and heavy equipment.

In October 1965, the USARV surgeon and engineer established a policy for space utilization and prepared guidelines to govern hospital construction. This policy was disseminated in a USARV regulation which stated that patient wards, operating suites, and X-ray facilities were to be located in air-conditioned semipermanent structures. The use of these structures for medical purposes was to take precedence over that for troop billets recreational areas, and administrative sections.

The improvement of existing medical facilities as well as the construction of new units continued to receive much attention during 1966 and 1967. Strict controls were placed on construction, and the position

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of base development coordinator was established at USARV headquarters. The base development coordinator was to evaluate the condition of hospitals and other medical treatment facilities, determine construction requirements, establish priorities, and limit or stop construction projects if duplication of effort was disclosed. Hospital construction was assigned a priority second only to the, requirements of tactical units and communication centers.

The construction of dispensaries and dental clinics was given a lower priority. Adequate control had been established over the construction of army-level (separate) dispensaries, general dispensaries, and dental clinics, but control over the construction of unit dispensaries was initially inadequate. Some units constructed elaborate facilities, often located -adjacent to another dispensary or hospital. Controlling these actions was difficult because of the maze of channels through which requests for construction were forwarded and approved. After appointment of the base development coordinator, these wasteful and uneconomical practices were greatly reduced.

Climate and weather created special problems in site selection and preparation. Buildings flooded during the monsoon rains, requiring extensive dike building and ditch digging to preclude a recurrence. Roads had to be hard-surfaced to be passable during the wet season. Grounds had to be seeded with grass to keep the dust down during the dry season.

Heavy-duty construction equipment itself had to he specially prepared to withstand the dust, mud, humidity, and intense heat.

Electrical power was limited in the cities and lacking in the countryside. Generators were installed to provide the vast quantities of current needed for lighting, air-conditioning units, and the electrically powered equipment of a modern hospital. Water was equally limited. Wells were dug or water piped in to furnish the running water needed for bathing, laundry, sterilization of equipment, and operation of flush toilets. Equipment was installed to make the water potable.

Through the concerted effort of contractors, the Corps of Engineers, and medical personnel, these handicaps were overcome and a series of superb hospitals capable of providing the finest care, in every branch of medicine and, surgery was established in Vietnam. After returning from Vietnam in 1968, General Collins commented, "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 some items of equipment in Vietnam that equal what you have at Walter Reed."

Special Units

MUST-equipped surgical hospitals were operated for several years, in Vietnam with mixed success. These, units consisted of three basic elements, each of which could be airlifted and dispatched by truck or helicopter. The expandable surgical element was a self-contained, rigid-panel shelter with accordion sides. The air-inflatable ward element was a double-walled fabric shelter providing a free-space area for ward facilities. The utility element or power package contained a multifuel gas turbine engine which supplied electric power for air-conditioning, refrigeration, air heating and circulation, water heating and pumping, air pressure for the inflatable elements, and compressed air or suction. In addition, other expandables were, used for central materiel supply, laboratory, X-ray, pharmacy, dental, and kitchen facilities.

By 20 October 1966, personnel and MUST equipment of the 45th Surgical Hospital had all arrived in-country. Work was begun on ground preparation and construction of quarters and a mess a few miles west of Tay Ninh. The utility packs and operating rooms and central materiel expandables had been moved next to the site when it was hit by mortars on 4 November and its commander, Major Gary P. Wratten, MC, was killed.

Two days later the hospital was ordered to become operational as soon as possible to support Operation ATTLEBORO, then in progress northeast of Tay Ninh. An emergency surgical capability and a 20-

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patient Holding capacity was completed on 8 November. The rest of the hospital was ready to open on 11 November when three more mortar attacks delayed operations until 13 November when the hospital received its first casualties.

Lieutenant Colonel (later Colonel) Thomas G, Nelson, MC, MUST professional consultant to The Surgeon General, reported in 1967 that, during, the early period of its operation, the 45th Surgical Hospital operated as a true forward

surgical hospital; that is, patients were, not held for, follow-up surgery or prolonged treatment.

Commenting on the relationship between helicopter evacuation and the employment of a forward surgical hospital, he continued:

> As was true of other hospitals in Vietnam, patients were moved directly from the battlefield either to a clearing station or a nearby hospital. . . . Most patients arrived at the hospital within 10 minutes of pickup, and some of these were in such critical condition, usually from internal bleeding or respiratory problems, that further evacuation even by helicopter would likely have been fatal. . . .
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> Patients were moved from the helicopter pad directly into the preoperative and resuscitation shelter where they were met by the surgical team on-call and the registrar section to initiate resuscitation and medical records. Patients were nearly always admitted in groups of from three to ten, and surgical priorities were established as blood administration and other stabilizing measures were employed and X-ray and laboratory determinations obtained.

The performance of the 45th Surgical Hospital led to the accelerated deployment of MUST equipment for three additional surgical hospitals in 1967: the 3d, 18th, and 22d. In 1968, the, 95th Evacuation Hospital was temporarily supplemented with some, MUST equipment until the construction of a fixed facility was completed. The 2d Surgical Hospital arrived in Vietnam in 1965 and had a long history of distinguished service before becoming the last unit to be equipped with MUST in January 1969. Meanwhile the Marine Corps was also using MUST equipment.

All medical facilities were vulnerable to enemy attack. On 4 and 11 November 1966, the 45th Surgical Hospital was subjected to mortar attacks. The 3d Surgical Hospital underwent a 15-minute mortar barrage on 24 July 1967, with direct hits on the bachelor officers' quarters and the MUST maintenance hut. Near misses caused extensive damage to practically all inflatable elements. No patients were wounded, although 18 members of the hospital staff received minor wounds. During 1968, the 3d Surgical Hospital underwent 13 attacks which resulted in damage to the hospital area. On 5 and 6 March the hospital suffered extensive damage from mortar and recoilless rifle fire. The headquarters and chapel were completely flattened; the dental clinic, X-ray, laboratory, medical library, medical supply building, and nurses' quarters were all damaged. The intensive care ward and postoperative ward were heavily damaged or destroyed. During this 2-day period, no patients were wounded, although three, staff members received minor fragment wounds. Repairs were completed quickly and the hospital remained operational throughout.

Until mid-1968, most field-army-level medical facilities, including MUST units, were not mobile. The 45th and 3d Surgical Hospitals remained stationary after the initial emplacement of MUST equipment. Billets, messhalls, and storage areas were constructed to support the units. Revetments were raised around all inflatable MUST components to make them less vulnerable during attacks. Difficulties, in relocating the 18th and 22d Surgical Hospitals earlier in 1968 demonstrated the need to retain mobility. Thus, late in 1968, the USARV surgeon instituted a policy that two MUST surgical hospitals would retain all equipment necessary to be completely mobile and that drills would be held frequently to keep hospital personnel, trained to displace, move, and emplace their hospitals rapidly. The 2d and 18th Surgical Hospitals were designated as "mobile" MUST's.

While MUST equipment was an important addition to the inventory of Medical Department assets, it was not used in accordance with doctrine. Its "transportable" attribute was not exploited. Because hospitals supported operations from fixed locations, emphasis was placed on the

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selection of a hospital site in a reasonably secure area. Proximity to tactical operations was a consideration only in the sense that the hospital had to be within reasonable air-evacuation time and distance. Hospitals had to be moved only when major tactical forces shifted to open new areas of operations, such as, for example, the large-scale buildup of US Army forces in I CTZ during 1968. MUST equipment was a link in such hospital relocations. Pending the construction of fixed facilities in new areas, MUST hospitals provided the controlled environment and the, other resources needed for high-quality patient care. As air-conditioned fixed hospitals were completed, the need for MUST equipment diminished. In late 1969, the MUST equipment was withdrawn from the 3d, 18th, and 22d Surgical Hospitals, leaving only two hospitals so equipped. The 3d and 18th Surgical Hospitals were reestablished in semipermanent facilities and the 22d Surgical Hospital redeployed to the continental United States. The 2d, and 45th Hospitals were closed out in 1970.

The convalescent center. During the visit of The Surgeon General, Lieutenant General Leonard D. Heaton, to Vietnam in early November 1965, General Westmoreland strongly recommended that a convalescent center be established in Vietnam, as soon as possible. Malaria was increasing among US forces, and too many patients suffering from malaria or hepatitis were being evacuated out of the country because they could not be hospitalized and returned to duty within the USARV 30-day evacuation policy. General Heaton accepted this recommendation and directed that a convalescent center be established.

The 6th Convalescent Center was activated on 29 November 1965, deployed to Vietnam during March and April 1966, and received its first patients on 15 May. The center was located at Cam Ranh Bay, adjacent to the South China Sea. Its mission was to provide convalescent care for medical and surgical patients, including combat wounded. After a year of operation, approximately 7,500 patients had been admitted to the center from all areas of the country. The patient census averaged more than a thousand a month, with malaria constituting 50 to 65 percent of all admissions, Other admissions included hepatitis patients and those requiring longer periods of postoperative, care than 30 days. Approximately 96 percent of all admissions were returned to duty-during an average, month, the equivalent of one to two battalions.

Prisoner-of-war hospitalization. During 1965, POW (prisoner-of-war) patients captured by U.S. forces were treated in US, medical facilities in the area where they were apprehended. Because of an increase in the number of prisoners, this policy was changed in early 1966. Special medical facilities for the care of prisoners of war, operated by two clearing companies, were, constructed at Long Binh and Phu Thanh (near Qui Nhon). Initial major surgery and postoperative care continued to be

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provided by an Army hospital before the POW patient was moved to a clearing facility. This system created a number of problems. It reduced the number of beds available for US soldiers, mixed prisoners of war US patients, and required a large number of guards. To alleviate these problems, both, clearing facilities were expanded by semipermanent construction into 250-bed hospitals with complete surgical resources.

During 1968, the POW patient load increased from an average of 250 to approximately 400. After several Reserve and National Guard hospitals arrived in October, the 74th Field Hospital assumed the POW mission of the 50th Clearing Company at Long, Binh and the 311th Field Hospital replaced the 542d Clearing Company at Phu Thanh.

During the first half of 1969, the patient load remained fairly constant. Average length of stay for wounded POW patients was 4 to 5 months, and each hospital had a 70- to 80-percent average bed occupancy. After hospitalization, patients were transferred to POW compounds operated by the Vietnamese Army. Upon the redeployment of the reserve hospitals to CONUS during the second half of 1969, the POW hospital mission was reassigned to the 17th Field Hospital and the 24th Evacuation Hospital. A decrease in combat activity reduced the average patient load in each hospital to approximately 100. Because the ARVN (Army Republic of Vietnam) had the largest: POW medical workload and the ultimate

responsibility for the prisoners' continued confinement, USARV proposed that ARVN administer the entire, POW hospitalization program. US Army hospitals would continue to accept and treat prisoners of war captured in their respective geographic areas until their medical condition permitted transfer to an ARVN hospital. In addition, the United States agreed to assist ARVN in reducing the reconstructive and rehabilitative surgical backlog of patients in ARVN hospitals. This concept was implemented in September 1969.

Offshore Support

The patient evacuation policy for Vietnam was established as, a 15-day minimum or a 30-day optimum. Under this policy, it was possible, to return to duty in Vietnam nearly 40 percent of those injured through hostile action and 70 percent of other surgical patients.

Out-of-country evacuation was by aircraft to Clark Air Force Base in the Philippines; from there evacuees were subsequently routed either to the continental United States, to Tripler General Hospital in Hawaii, to the US Army Hospital, Ryukyu Islands, or to Japan. In the summer of 1966, direct evacuation by jet aircraft of patients from Vietnam to the continental United States via one stop in Japan was inaugurated.

Patients received in the continental United States were mostly accommodated in general hospitals nearest their homes, but some were

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regulated to class I hospitals even nearer their homes when these hospitals had beds available and the professional capability of treating their injuries.

As the entire Republic of Vietnam had been designated a combat zone, fixed hospitals that give long-term care to patients and are normally found in a communications zone were not present. If all the injured or sick who could not be returned to duty in Vietnam within the established 15- to 30-day evacuation policy had been evacuated to the continental United States, it would have created a great drain of experienced manpower from the combat zone. To give this fixed-bed capability, the equivalent of about 3½ general hospitals were established in Japan to receive and care for patients who could be expected to return to duty within 60 days.

Evacuation

In-Country

Highly mobile and widely deployed forces must have a highly mobile and flexible medical evacuation system immediately responsive to their needs. The helicopter ambulance provided this flexibility and responsiveness in Vietnam. At the peak of combat operations in 1968, aeromedical support was provided by 116 air ambulances. These helicopters, could transport six to nine patients at a time, depending upon the number of litter cases. Medical evacuation flights averaged only about 35 minutes each, a feat which often meant the difference between life and death for hundreds of patients. The more seriously wounded usually reached a hospital within 1 to 2 hours after they were injured. Of the wounded who reached medical facilities, about 97.5 percent survived.

The helicopter brought modern medical capabilities closer to the frontline than ever before. Furthermore, combined with a medical radio network, the helicopter provided greater flexibility in regulating patients. Preliminary evaluation of, the injury and the condition of the patient was made while in flight, and the use of the radio network permitted redirecting the patient to the nearest hospital suited to his needs. If a hospital developed a surgical backlog, the combination of helicopter and radio facilitated regulating patients according to available operating facilities, rather than available beds. This combination was the core of the Army medical management system in Vietnam.

The buildup of air ambulance units. The buildup of air ambulance units paralleled the commitment of US combat forces to Vietnam, The, first air ambulance unit sent to Vietnam, the 57th Medical Detachment (Helicopter Ambulance), later nicknamed "The Originals," arrived in 1962 to support the 8th Field Hospital at Nha Trang. The unit was authorized five HU-1A aircraft, which were replaced by an improved model, the "B" version, in March 1963. Initially, two aircraft were

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stationed at Qui Nhon and three in Nha Trang. As fighting increased around Saigon and in the Delta, the helicopters were shifted from place to place in response. The 82d Medical Detachment (Helicopter Ambulance) became operational in IV CTZ (the Delta), in November 1964.

The buildup of units continued at an accelerated pace in 1965. The 283d Medical Detachment (Air Ambulance) arrived in August 1965, followed by the 498th Medical Company (Air Ambulance) in September. The 254th Medical Detachment (Air Ambulance) arrived in Vietnam before the end of the year but did not become operational until February 1966 because a backlog, at the port delayed the arrival of the unit's equipment. The four detachments, each authorized six helicopters under a new table of organization and equipment, supported III and IV CTZ's. The 498th Medical Company, which was authorized 25 aircraft, supported II CTZ.

During 1967, the 45th Medical Company (Air Ambulance) and four additional air ambulance detachments arrived in Vietnam. The units were shifted from location to location to provide the most effective area coverage in response to tactical operations. In 1968, four additional detachments were sent to Vietnam, completing the buildup of aeromedical evacuation units. One unit, the 50th Medical Detachment, which was assigned to the 101st Airborne Division in mid-1968, became the nucleus of the division's air ambulance platoon. By 1969, there were 116 field-army level helicopter ambulances in Vietnam. These were assigned to two companies and 11 separate detachments. (*Map 3*)

Air Force aeromedical evacuation support. The Army and the US Air Force evacuation systems complemented each other, each carefully continuing the movement of wounded or sick until they reached a final-destination medical facility.

Based on experience gained in World War II and the Korean War, the US Air Force initially used returning assault or cargo aircraft for casualty evacuation. The system worked well during the early stages of the Vietnam War, because the number of sick and wounded was relatively low. As troop strength increased and combat operations became more intense, the system grew progressively less satisfactory. The requirements for evacuation often coincided with the most urgent needs for resupply, although not always at the same location.

The old system was therefore abandoned in favor of a new one in which aircraft were, regularly used specifically for evacuation purposes. The 903d Aeromedical Evacuation Squadron scheduled the first regular in-country evacuation flights in 1967. By late 1969, the number of regular scheduled flights had increased to 188. The assault aircraft initially used for aeromedical evacuation were supplemented, in early 1968, by C-118 cargo aircraft specifically modified for evacuation missions. The average

number of patients moved increased from 5,813 per month between July 1967 and January 1968, to 9,098 from March to June 1968. During the Tet Offensive in February 1968, more than 10,000 patients were evacuated, by the Air Force.

"Dust-off." Those Army medical evacuation helicopter units not organic to divisions carne to be called Dust-off, after the radio call sign of

the most famous of the early pilots, Major Charles L. Kelly, MSC, who was killed in action on 1 July 1964. Several scores of, these flying "medics" flew their unarmed helicopters into hostile areas, risking their own lives to save those of others. In a 2-year period, 39 crew members were killed and 210 wounded in aeromedical evacuation missions.

The combination of the helicopter ambulance and a medical radio network was the basis of the effective medical regulating system that evolved in Vietnam. During the first phase of U.S. troop commitment to Vietnam in early 1965, there was only one hospital in support of each CTZ and therefore, no alternative to the destination of a casualty. As the number of hospitals and the number of casualties increased, however, the need for a regulating system became imperative. The first system in the III and IV CTZ's was set up with Air Force Radar Tan Son Nhut, Paris control. Dust-off helicopters inbound called Paris control which had a direct-line field telephone, "hot line" to the MRO (medical regulating office) and the 3d Field Hospital. The three major treatment facilities available were the 3d Field Hospital, the 93d Evacuation Hospital, and the 3d Surgical Hospital, the last named then located at Bien Hoa. The MRO confirmed or changed the destination chosen by the pilot as the medical situation indicated.

After Headquarters, 44th Medical Brigade, arrived in Vietnam in 1966, the brigade MRO became responsible for all in-country regulating of patients. Medical groups controlled the movement of patients from tactical areas to hospitals within their own group areas. Further movement of patients from one group area to another was coordinated by medical group MRO's with the brigade MRO, who maintained over-all control to insure, proper usage of all medical facilities.

Telephone communications were abysmally poor and radio communications not much better during this period. When heavy fighting produced a large number of casualties and medical regulating was most urgently needed, operational radio traffic was also heaviest. Moreover, since short-range radios were used, requests for evacuation had to be routed from divisional medical battalions to backup hospitals by way of the Dust-off radio network or through the supporting field army medical group. This cumbersome method caused delays and sometimes resulted in garbled transmissions.

On an experimental basis, the 55th Medical Group at Qui Nhon borrowed single-sideband long-range radios from the 498th Medical Company (Air Ambulance). Originally placed in the air ambulance company for long-range transmissions to its aircraft on evacuation missions, these radios had been little used because of the relatively short distance of most flights and the extensive maintenance they required. Their use for medical regulating proved highly successful, and an additional 54

sets were ultimately acquired to expand the communications network throughout the medical brigade.

Medical regulating started on the battlefield. Medical groups placed regulators (senior noncommissioned officers) in areas of troop concentration or at the site of a combat operation. In cooperation with the local medical unit, the regulator radioed requests for evacuation to the supporting Dust-off unit. The transmission was monitored by the MRO at his medical group headquarters.

In the absence of a field medical regulator, a request for air evacuation was normally made by the medical aidman at the site of the casualty. The request, which included such information as the number of patients by type, the exact location by map grid coordinates, data on enemy movements, and the radio frequency of the requesting unit, was transmitted over the Dust-off radio network to the supporting air ambulance unit. Frequently the call was received by an air ambulance already in flight which could be diverted from a less urgent mission. If not, a standby crew at a field site or at the unit headquarters, scrambled to make the pickup.

After proper identification of the ground force with the casualty, the Dust-off helicopter generally made a high-speed or tight-circle approach into the area. Time spent on the ground in a normal operation was usually between 30 seconds and 1 minute, depending on the number of casualties. The casualty was given emergency treatment by, the medical aidman on board as soon as the aircraft was out of the combat area.

The patient was flown directly to the medical treatment facility best able to give the care required. This might or might not be the one nearest the site of injury. The decision as to the proper destination hospital was based on several factors. Distance was less important than time; the objective was to reduce the time between injury and definitive treatment to the minimum. Information based on the preliminary in-flight evaluation of the injury and the condition of the patient, knowledge of existing surgical backlogs, and the over-all casualty situation were other considerations. If the aircraft commander questioned the destination selected by the medical regulator because of his knowledge of the patient's condition, a physician was consulted by radio while the patient was still in transit before the decision became final. The inbound medical aircraft commander informed the receiving hospital by radio of his estimated time of arrival, the nature of the casualties on board, and any special reception arrangements that might be, required. Thus, the receiving hospital was able to have everything in order to receive casualties and begin definitive surgical care.

Helicopter evacuation techniques and requirements varied by geographic area, type of combat operation, and type of equipment available, and changed from year to year as experience modified and refined pro-

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cedures. Since the air ambulance was unarmed, gunship support was requested if the ground reported contact with the enemy in the vicinity of the pickup site, or if the rescue was a hoist operation.

In "hot" areas, the crew of the evacuation aircraft consisted of a pilot, copilot, crew chief, medical aidman, and a man armed with an automatic rifle. In quieter areas, the rifleman was left behind in favor of increased patient capacity. On hoist operations in mountainous and jungle, terrain, before the more powerful "H" model aircraft was introduced, the crew consisted only of a pilot, copilot, and hoist operator. On these missions, fuel load was also generally reduced in favor of greater lift capability. Night missions were quite common, often comprising 15 to 20 percent of the, total missions in some areas.

Helicopter rescue operations were, aided by new equipment designed especially for use in jungle terrain or in combat areas where it was too dangerous, for a helicopter to land. The hoist consisted of a winch and cable on a boom which was moved out from the aircraft when it arrived over the rescue site. At the end of the cable was a ring and hook to which a Stokes litter, rigid litter, or forest penetrator could be attached. The cable could be lowered at the rate of 150 feet per minute and retracted at the rate of 120 feet per minute. The forest penetrator, a spring-loaded device which could penetrate dense foliage, opened to provide seats on which a casualty could be strapped. It was preferred over the litter by the crews for hoist, rescues; because it was less likely to become entangled in the trees.

Hoist operations significantly increased the danger for Dust-off crews. Hovering above the jungle or a mountain side as it lowered its cable, the helicopter became a "sitting duck" for enemy troops in the area. In 1968, 35 aircraft were hit by hostile fire while on hoist missions. The number increased to 39 in 1969. Nonetheless, the hoist was used extensively and to great advantage in Vietnam. Its use permitted the rescue of 1,735 casualties in 1968 and 2,516 casualties in 1969, who otherwise, could not have been retrieved.

The primary mission of the Army helicopter ambulance was the in-country aeromedical evacuation of patients. The number of patients evacuated by aeromedical evacuation helicopters rose from 13,004 in 1965, to 67,910 in 1,966, to 85,804 in 1967, and peaked at 206,229 in 1969. These figures included members of the ARVN, Vietnamese civilians, and Free World forces as well as

US patients. Each time a patient was moved by helicopter, the move was entered in the tally. Thus, if a patient was taken to a surgical hospital by helicopter and later transported from there to an evacuation hospital by helicopter, this would count as two patients evacuated. Army air ambulances completed more

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than 104,112 aeromedical evacuation missions while flying approximately 78,652 combat hours in 1969.

In addition, to this primary mission, Army helicopters were also used to transport, professional personnel, medical supplies, and blood to medical facilities. Supplemented by scheduled Air Force flights, and from time to time by larger helicopters, they were also used, to transport patients between hospitals for consultations or to free beds in areas where increased casualties were anticipated.

Out-of-Country

The Air Force provided all out-of-country aeromedical evacuation. Initially, out-of-country medical regulating was controlled at the FEJMRO (Far East Medical Regulating Office) at Camp Zama, Japan, through a representative functioning at the Office of the Surgeon, USMACV. To handle the increased volume of traffic, a branch of the FEJMRO was established in Vietnam and Major (later Lieutenant Colonel) Robert, M, Latham, MSC, reported as Chief, FEJMRO (USMACV), in July 1966. FEJMRO allotted bed space in hospitals, in the Pacific area for FEJMRO (USMACV) use, and issued "bed credits" on a 24-hour basis. This information was relayed to Vietnam via Clark Air Force Base in the Philippines because communications between Japan and Vietnam were chronically poor. Late in 1966, a direct system for transmitting information between the two offices was adopted.

The procedures for regulating out-of-country evacuations were further improved in November 1967. Under these new procedures, medical group regulating officers, submitted consolidated requests, for evacuation to the medical brigade MRO who then sent a single request to FEJMRO (USMACV). In turn, information concerning destination hospitals was sent back down the line. The new system enabled hospitals in Vietnam to follow up on patients and permitted medical facilities to close out clinical records. It also provided information more promptly on the total number of evacuees to casualty staging facilities, the Military Airlift Command, and offshore hospitals. Routine calls were handled within a 36-hour period, and urgent evacuation requests were processed within an hour if an aircraft was available.

Since substantial US. forces were committed to Vietnam in 1965 the relative continuity of combat was as much a factor in building up

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patient loads as was the severity of fighting. Under such conditions, patient evacuation was therefore accelerated to provide for contingencies. The 9th Aeromedical Evacuation Squadron, for example, increased its flight schedule from two weekly departures from Tan Son Nhut to daily flights with additional sites for departure at Da Nang and Qui Nhon. The number of evacuations out-of-country increased from 10,164 in 1965 to 35,916 in 1969. (*Table 8*)

TABLE 8.-TOTAL NUMBER OF PATIENTS EVACUATED FROM VIETNAM, US ARMY, BY MONTH, 1965-69

Month	1965	1966	1967	1968	1969
January	164	832	1,469	2,417	3,224
February	227	1,330	1,851	3,576	3,099
March	226	1,062	2,178	2,471	4,166
April	252	853	1,780	2,782	3,210
May	300	1,298	2,367	3,952	4,334
June	480	1,256	2,072	2,701	3,951
July	471	766	1,595	2,569	2,879
August	821	957	1,521	2,700	3,308
September	999	942	1,431	3,401	2,187
October	1,978	983	1,851	2,856	1,890
November	2,361	1,331	2,435	2,790	1,789
December	1,885	996	2,152	3,176	1,879
Total	10,164	12,606	22,702	35,391	35,916

Source: Army Medical Service Activities Report, MACV, 1965; Army Medical Service Activities Reports, 44th Medical Brigade, 1966, 1967, 1968, 1969.

Initially, out-of-country evacuation was by aircraft to Clark Air Force Base; from there evacuees were routed either to the continental United States; to Tripler General Hospital in Hawaii, to the US Army Hospital, Ryukyu Islands, or to Japan. In the summer of 1966, to reduce the drain of experienced manpower from the combat zone, the equivalent of about 3½ general hospitals was established in Japan to receive and care for patients who could be returned to duty within a 60-day period. C-141 Starlifter jets, which were used to transport troops to Vietnam, were quickly reconfigured to evacuate patients to Japan. The C-141 could carry 80 litter, 121 ambulatory, or a combination of 36 litter and 54 ambulatory patients. After a 6-hour flight to Japan where patients to be retained

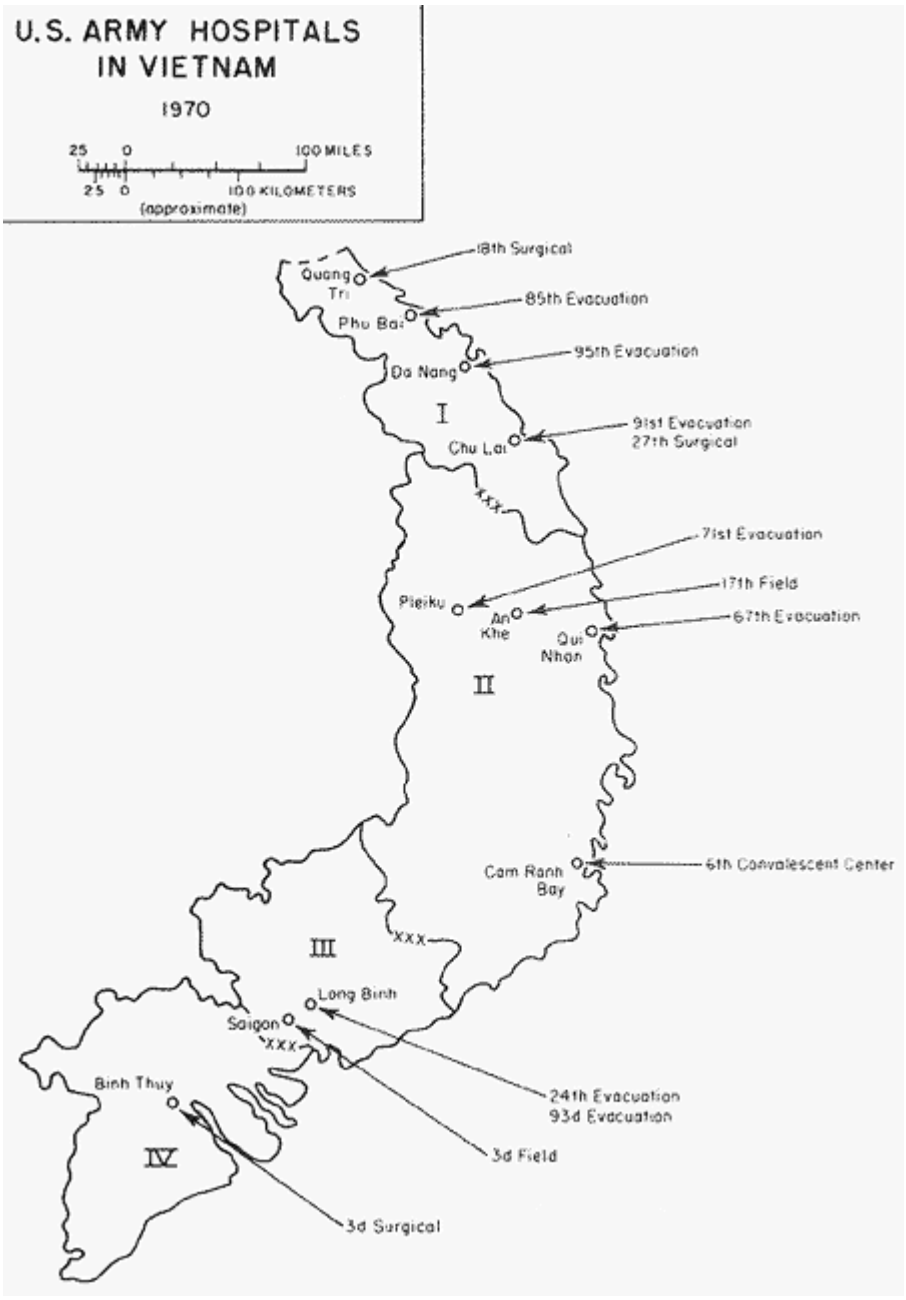
disembarked, patients bound for the continental United States boarded and the aircraft continued either to Andrews Air Force Base, Washington, D.C. (18 hour-, via Elmendorf Air Force Base, Alaska) or to Travis Air Force Base, Calif., by a direct 10-hour flight.

Throughout the chain of evacuation, the well-being of the patient Was of Overriding concern. At all points along the chain, a qualified flight surgeon was on hand to determine if the evacuation should be continued. If necessary, a physician accompanied a severely wounded or critically ill patient. At all times, the finest medical care was given to the wounded or sick soldier as he progressed through the aeromedical evacuation system.

Reduction and Reorganization

The de-escalation of combat activities in Vietnam during 1969 and 1970 was paralleled by a reduction in the number of hospitals and air ambulance units. During 1969, three Reserve hospitals returned to the continental United States. The 7th and 22d Surgical Hospitals and the 29th and 36th Evacuation Hospitals were inactivated. The number of beds in operation decreased from 5,189 to 3,473 by the end of the year. During 1970, the 8th Field, the 2d Surgical, the 45th Surgical, and the 12th Evacuation Hospitals were redeployed or inactivated. (Map 4) The 254th Medical Detachment (Helicopter Ambulance) was inactivated in November.

A new structure for administering the medical units still in-country was authorized. Early in 1970, outlying dispensaries and clinics were placed under the command and control of the hospital in the closest geographic proximity. This change resulted in the inactivation of the headquarters elements of two medical battalions. The two medical battalions in-country were reorganized and given command and control of all medical evacuation helicopter, field ambulance, and bus ambulance resources. One medical evacuation battalion was assigned to each of the two medical groups that remained in Vietnam.



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"Medical Support of the U.S. Army in Vietnam, 1965-1970" by Major General Spurgeon Neel (1991)