Chapter Four

Operation Desert Shield/Desert Storm

America Reconsiders Its Defenses

The Vietnam drawdown ran from 1969 through 1973. US military involvement had started with advisers and support units and escalated into the deployment of combat units; the drawdown reversed this process, with combat units leaving first. Advisers and a few support units were the last to go. Although support for NATO and the defense of Japan and Korea remained strong, the American public had lost confidence in the "domino theory," and Congress restricted aid to other Southeast Asian countries. However, as historian John Guilmartin has noted, the effort in Vietnam may have helped prevent communist insurgencies in other US allies in southeast Asia, such as Thailand and the Philippines. In 1973, President Richard Nixon became embroiled in the Watergate scandal, further weakening him politically and making it harder for him (and his successor, Gerald Ford) to continue a hard-line containment foreign policy.

Throughout the 1970s, domestic issues such as economic problems (inflation, unemployment, and an economic crisis sparked by rising oil prices); women's rights (eg, debates on the proposed Equal Rights Amendment); and environmental concerns (the first Earth Day was in 1970) absorbed much of the nation's energy. President Jimmy Carter's foreign policy emphasized human rights rather than supporting any regime that opposed communism without regard to its domestic policies. Yet Carter also bolstered defensive measures against the Soviet Union, persuading NATO countries to increase defense spending, developing various advanced weapons systems, and increasing nuclear weapons. Toward the end of the 1970s, as the Soviets became more belligerent, both Carter and the American public grew more hawkish. A harder line on defense helped Ronald Reagan win a landslide election in 1980. He immediately began a substantial defense buildup (1980–1985 saw the longest peacetime military buildup in American history), and Reagan deployed many of the weapons systems Carter had begun to develop. The Army deployed new weapons, filled under-strength

units, increased training, and boosted pay and professionalism, but added few combat divisions.

The 12th Evacuation Hospital, inactivated in 1970, was formally reactivated on January 16, 1983, at Heidelberg, Germany. Its mission was simple: to be prepared to treat casualties in the event of a Soviet attack on NATO.

The 1980s Army

The Army in 1983 differed substantially from the way it was in 1970. The draft had ended, so all soldiers were now volunteers. More soldiers intended to make the Army a career instead of a 2-year rite of passage, and their average age rose, with attendant changes in the Army's demographics: more soldiers were married, with children and houses. Because soldiers had to be ready to deploy on short notice, but could not entirely jettison their family responsibilities, the Army was forced to get involved with family issues. Soldiers, including single parents and two-soldier families, had to have family-care plans for their dependents.

Because the military now had to attract volunteers, pay, benefits, and conditions improved. For instance, better housing was provided, and civilians were hired for jobs such as landscaping and food preparation so troops could spend more time training, and take more pride in defending the country rather than mowing grass or peeling potatoes. The Army also cracked down on drugs (mandatory drug testing was implemented in 1984) and alcoholism, and tried to discourage smoking. Women made up a much larger percentage of the Army, and their increasing integration at first caused friction in the conservative military environment, but eventually led to cultural change. Some of the Army's policies were purely practical: pregnant soldiers were allowed to stay in the Army because of the cost of finding and training replacements, and cracking down on sexual harassment helped attract female volunteers in the first place. But treating women fairly, as soldiers and American citizens, was also an important Army principle. Attempts to treat women fully as soldiers replaced the WWII idea of women serving to "free a man to fight," and women began receiving weapons training in 1974. More military jobs were opened to women, and in 1978 the Women's Army Corps was abolished.

Recruiting medical professionals proved difficult. In the military, many medical specialties were still paid far below their civilian equivalents, and thus the services were short of physicians, dentists, and other clinicians. The shortage compelled the Army to find new ways to staff its field hospitals, for example, through the expanded Professional Officer Filler Information System (PROFIS), which assigned each officer a mobilization position. Originally applied only to physicians, PROFIS was extended to address shortages of other clinicians such as pharmacists and nurses. Ideally, PROFIS assigned officers a "go to war" position that matched their clinical skills, but a Government Accounting Office (GAO) report showed many problems, including units letting their requirements

get out of date, and neither Forces Command nor Health Services Command took strong action to make the system work.

The 12th Evac in Germany

Through the 1980s, only a handful of the 12th's assigned enlisted personnel and nonclinical officer positions were actually filled. In garrison (the 12th moved to Wiesbaden at an unknown date after its reconstitution in early 1983), a chief nurse was assigned to administer and train the enlisted medics, although the peacetime chief nurse would be replaced by a more senior officer upon mobilization. Initially the 12th had only 12 personnel, and by 1988 it still had only 50—barely enough to inventory equipment, do maintenance, and turn in reports. In 1989 the number increased to 108, roughly half strength for the nonmedical personnel and including almost no medical personnel. That year the unit received the latest generation of hospital tentage and equipment, the Deployable Medical System (DEPMEDS). Previously, evacuation hospitals worked in ordinary tents, setting up ad hoc vestibules and connectors, and rigging up their own electricity, water, and air conditioning. DEPMEDS was a purpose-designed system of modular tents with connecters, utility connections, and expandable containers to hold the operating rooms, pharmacy, laboratory, and radiation facilities. Equipping the 12th and the other deployable hospitals in Germany with DEPMEDS was part of the Reagan-era build-up, increasing the Army's readiness to fight a Soviet invasion.

Training with the new equipment was the unit's main focus. A training week typically included 2 days of maintenance (for vehicles, unit equipment, and medical equipment), a day of unit-directed training that varied as needed, half a day of training in sections (one hospital section would be set up, use its equipment, then repack), half a day of basic soldier skills, half a day directed by the sergeants, and a half-day off for soldiers to schedule appointments or take care of personal matters. With the unit well below authorized strength, not all sections could train at once; instead they trained in rotation, using their own staff as well as personnel from other sections. Because of this cross-training, enough troops were familiar with the 12th's equipment to serve as the unit's core when PROFIS officers and additional enlisted personnel arrived. Medical enlisted personnel assigned to the 12th also spent 90 days per year at Army hospitals and clinics, keeping their medical skills fresh.

In garrison, the 12th was commanded by a junior officer, at first a captain from the Medical Service Corps. A new commanding officer would arrive on mobilization with the rest of the personnel, according to Army policy, which mandated that all mobilized hospitals be commanded by a physician rather than the administrative officer who had been peacetime commander.

The Army's mission for evacuation hospitals had not changed much since Vietnam. Evacs were the biggest, most capable hospitals assigned to the combat zone, with two assigned per combat division. Evacs were supposed to deploy

at the rear of the combat zone, roughly 35 to 50 miles from the front line. Each had 400 beds (45 intensive care, 300 intermediate care, and 55 minimal care), and about 400 staff, including 22 physicians, a dentist, and 114 nurses. Half the personnel were armed for personal defense and protection of the wounded. However, hospitals still expected to receive help from military police if they held prisoners of war. Evacuation hospitals were no longer intended to be semi-mobile; their assigned vehicles could carry 84,000 pounds of equipment, only one-seventh of the authorized 578,000 pounds. Evacs needed help to move, especially since most units took extra equipment on deployment.

The Persian Gulf Crisis

On August 2, 1990, Iraqi forces invaded Kuwait. Iraq occupied the entire country and announced that Kuwait was annexed as Iraq's 19th province.

The US government believed that aggression should not be rewarded. Almost immediately, US diplomats began pressing Saudi Arabia to admit American troops to deter possible further Iraqi aggression. Saudi Arabia hesitated to invite Christians—and female soldiers—into a country that holds a special place in the minds of Muslims. Displaying the Red Cross on hospitals in a Muslim country was also controversial, although it was soon approved.

The Saudi government soon saw that Iraq was a greater threat than the challenge to traditions, and within a week of the Iraqi invasion US troops were en route. The first troops were lightly armed paratroopers of the 82d Airborne Division, America's high-mobility and high-readiness national reserve, with air support. Over the next weeks and months, a solid defensive force was built up, with a broad international coalition contributing troops, supplies, and money. Several Arab countries sent troops. President George HW Bush also activated a number of reserve and National Guard units, starting in August 1990 and continuing into January 1991. Ultimately almost 240,000 reserve component service members were activated.

By late 1990, Iraq showed no sign of withdrawing and diplomatic options were narrowing, so President Bush called for war plans. The projected costs of initial plans would rise if Iraq used chemical weapons, and planners worried that Saddam Hussein was more likely to use chemical or nuclear weapons if the ground conflict dragged on. Therefore, plans were changed to deploy more forces, generate more combat power, and quickly overwhelm the Iraqis. Additional troops were available because the dissolution of the Soviet Union had freed NATO troops from defensive positions in Europe.

The 12th Gets the Call

On November 8, 1990, President Bush decided to deploy more US forces to Saudi Arabia. For the first time, US Army, Europe (USAREUR) would deploy

ground units, sending VII Corps to Saudi Arabia. Responding to rumors beginning in September that the 12th would be the first hospital to deploy from Germany, the unit and its headquarters, the 68th Medical Group, had assembled lists of requirements. Although the 12th Evac was a V Corps unit, on November 10th it was tapped to support VII Corps. Lieutenant Colonel Virgil East, the peacetime commander, made the announcement. The unit had half its nonmedical strength (administrative officers and nonmedical enlisted personnel), but no medical personnel. Almost all the existing staff were ready to deploy; only a few soldiers were pregnant or had other medical conditions, and none had to stay in Germany due to family problems. To fill gaps, the 7th MEDCOM pulled individual soldiers from other medical units and facilities in Europe. Borrowed staff included enlisted medical personnel such as pharmacy technicians, operating room technicians, and licensed practical nurses, as well as maintenance personnel, especially senior noncommissioned officers and maintenance warrant officers.

The new commander, Colonel Arthur "Mike" McGuire, left Lieutenant Colonel East to handle matters at Wiesbaden and traveled around Germany to assess his new personnel. As the 12th deployed from Europe, the unit got what McGuire thought was "the pick of the crop." The medical staff, including enlisted personnel, all had substantial clinical experience, and all were at least in their second assignment in the Army. However, despite their clinical experience, the staff was not necessarily up-to-date on field skills, and some had unrealistic expectations about deployment. They were coming from scattered locations, which meant their families had trouble supporting each other, but most Army communities in Europe were deploying units and individuals to Saudi Arabia, and families could get help from their installations and community.

Being familiar with the theater of operations, Major General Michael Scotti, the commander of 7th MEDCOM, stressed two particular training tasks for units to prepare for deployment: units had to handle the harsh desert environment without degrading their operations, and they had to be fully ready to operate if chemical weapons were used. The 332d Medical Brigade, the 12th's higher headquarters in Saudi Arabia, would reinforce this requirement in Saudi Arabia, requiring units to practice all their critical tasks while wearing full chemical-protective suits. Although the 12th completed a course on caring for chemical casualties, its first priority was packing equipment and concurrently filling any shortages.

Necessary equipment arrived at the same time as the new personnel. The 12th had roughly 90% of its required equipment, but gaps remained, especially in medical supplies. The garrison supply officer, Lieutenant Alejandro Lopez-Duke, recalled times when millions of dollars worth of supplies and equipment were sorted and packed the same day they arrived. V Corps was determined to do its best for VII Corps, and the 12th deployed with extra equipment. The bulk of the work was done by the men and women assigned to the 12th full time

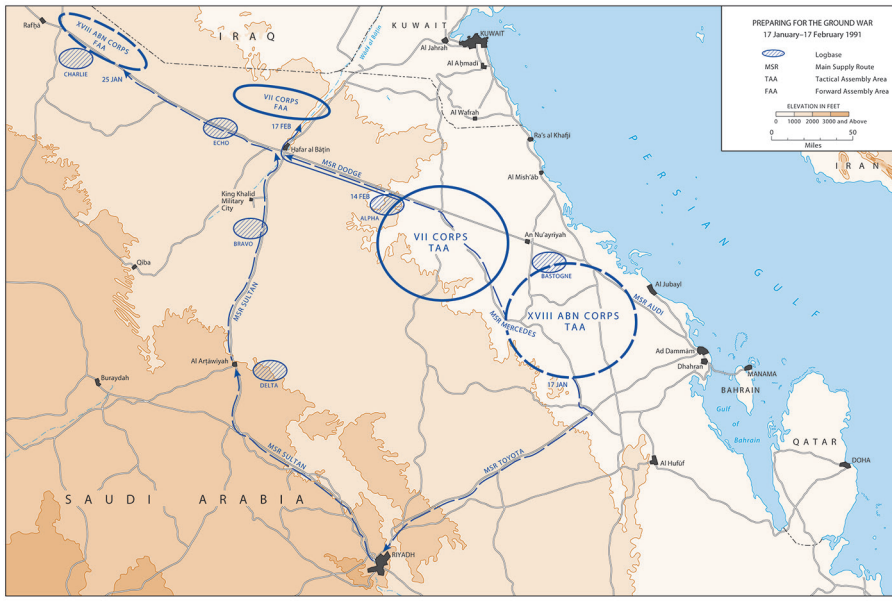
because the enlisted "filler" personnel did not arrive until a week after the equipment had been loaded. On November 30, a three-person advance party flew to Saudi Arabia to determine where the 12th would be located and begin linking the unit into the deployed supply systems.

Deployment to Saudi Arabia

New and replacement equipment arrived over 2 weeks. Personnel loaded the equipment onto railcars on Thanksgiving Day, November 24, 1990, in a cold rain, cold enough that ice formed on metal surfaces. Vehicles and trailers arrived from other units even on the day of loading, and Lopez-Duke remembered painting the 12th's numbers on the gear as it arrived, using hair dryers to melt the ice and then dry the paint. The Army had begun using barcodes, the new Transportation Coordinator Automated Command and Control Information System, and the barcodes had to be stuck onto equipment and then scanned before ice formed and obscured them. It was a long, hectic day, but by 1900 all the vehicles and containers were ready for shipment.

The 12th reached full strength on December 4, 1990, and the next evening 311 soldiers boarded a chartered airliner for the flight to Saudi Arabia. After the long

Figure 4-1. Aerial view of the 12th Evacuation Hospital, Saudi Arabia. Photograph courtesy of Colonel Mike McGuire.



Map 4-1. The theater of operations, showing major logistical bases and routes, and both tactical assembly areas and forward assembly areas for the US maneuver forces.
Map courtesy of the US Army Center of Military History, Fort McNair, Washington, DC.

flight, the soldiers' first task was to erect tents for living quarters, a test for many personnel unpracticed in field skills.

For 2 weeks the main body of the 12th was stationed in a tent city staging area outside the port of Dhahran, the Coalition's main logistics port. Much of this time was spent organizing the unit, integrating the newly arrived medical staff with nonmedical personnel who had comprised the 12th in garrison. For instance, the chief nurse had to meet all the new nurses, learn their qualifications and experience, and then assign them an appropriate position. Personnel from various other units who had joined the 12th's peacetime cadre were also integrated. Arriving equipment was unloaded, missing items were secured, and transportation was arranged. The transportation of equipment from Germany was moving slower than planned, and a quarter of the ships were late. Furthermore, equipment from various units was carried on each ship, so units had to wait for multiple ships to arrive. The typical support battalion had equipment on 17 ships arriving over 37 days. A few items had to be relocated after other units appropriated them from the acres of equipment at Dhahran.

Each step required coordination with a variety of other units and headquarters, and both supplies and transportation also involved Saudis. Supplies were purchased from local companies, and much of the transportation was via Saudi

trucks and buses rather than Army vehicles. Evac hospitals were so short of transport that damaged and abandoned trucks and buses were retrieved from the Trans-Arabia Pipeline (TAPLINE) Road for repair and issue until Saudi police discovered and stopped the operation. Buying items in Saudi Arabia had tricky aspects. Units were allotted money and told they could buy needed items that were not available through the supply system. However, if an item such as a tent heater was authorized but in short supply, it could not be purchased. The Saudis also refused to sell some items, including flashlights, because large Coalition purchases would empty the stores.

On December 12 the advance party again moved ahead, to grid coordinates near kilometer 478 on the TAPLINE Road, in the desert about 300 miles from Dhahran, the unit's wartime base. The base was 12 to 15 acres of desert, in sight of the TAPLINE Road and close to Logistics Base Alpha. It was not near other logistics units, however, because Major Steve Tefft, head of the 12th's scouting party, wanted to avoid other potential targets, afraid the 12th would "get creamed." A sergeant single-handedly laid out all the stakes to guide tent and shelter set up, a huge task, while others in the advance party obtained extra tents for living quarters and dealt with other arrangements. A week later the first batch of 130 personnel on 63 vehicles arrived.

The 12th had DEPMEDS tents for the hospital, but living quarters and other functions required general purpose (GP) tents. Augmentation teams with specialized medical skills also needed tents. Ultimately the 12th set up well over a hundred GP tents. The 12th did not have enough forklifts, so it borrowed RTCHs (rough terrain cargo handlers) from the Corps Support Command to move the shipping containers holding the operating rooms and other key components. On the 21st, as the layout was completed, the second group of personnel arrived, and the third group arrived the next day. A cavalry regiment was in the area for protection, but this force could not have stopped a determined Iraqi thrust and, according to rumor, it was not yet fully supplied with ammunition. Engineers erected a 12-foot-high sand wall as a protective perimeter around the base, and other Army units provided a range of specialized logistical services. The Army had started experimenting with civilian contractors for many support functions but had not yet formalized the process, and in Saudi Arabia the Army provided almost all logistical support.

Even during the holidays, staff worked steadily, establishing the triage area, the pharmacy, and the medical laboratory and several wards as well as installing the radiographic and operating room equipment in about 3 days. The hospital became operational on December 29. The 12th's enlisted garrison troops from Wiesbaden knew how to erect the DEPMEDS equipment, and doctors and nurses, captains to colonels, worked under sergeants. Once the tents were up, enlisted personnel continued to direct operations, moving the medical equipment in, setting it up, and training hospital-oriented officers on the field equipment they would be using. Defensive measures included digging bunkers in case of

artillery fire, bombing, or missiles, and filling sandbags to protect tents. Colonel McGuire originally intended to use metal pallets to roof over bunkers, but pallets were in short supply and had to be turned in, and wooden roofs were substituted. All ranks contributed skills from carpentry to plumbing to complete various projects.

Operational Preparations

The 12th was located where the main Coalition attack was planned and where heavy casualties were anticipated. The war plan had three elements: to the east,

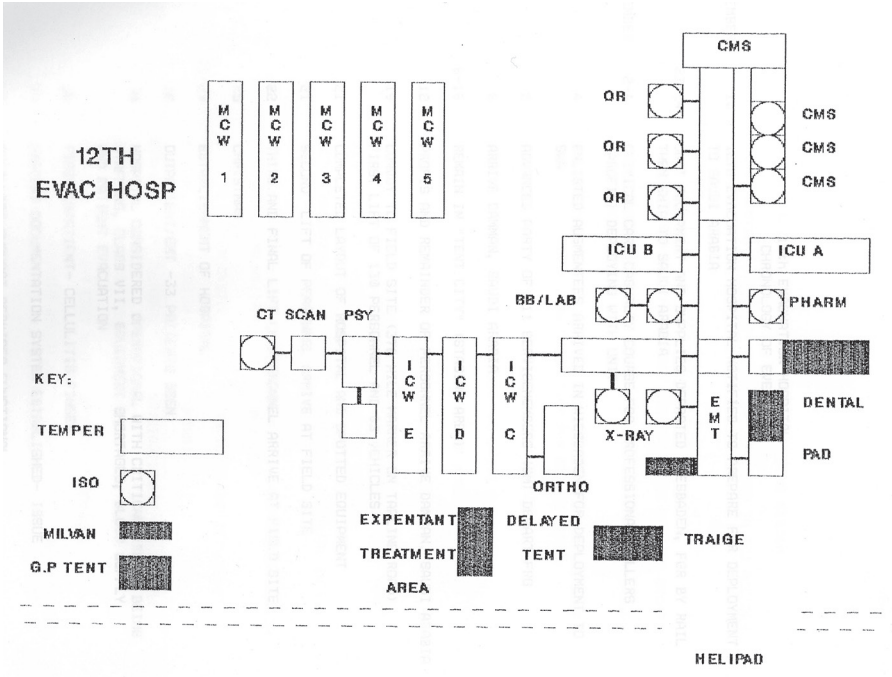


Figure 4-2. Diagram of the 12th Evacuation Hospital in Saudi Arabia.
BB/LAB: bloodbank/laboratory; CMS: central materiel supply; CT Scan: computerized tomography scanner; EMT: emergency medical treatment; GP Tent: general purpose tent; ICU: intensive care unit; ICW: intermediate care ward; ISO: International Standards Organization; MILVAN: military van; MCW: minimal care ward; OR: operating room; ORTHO: orthopedic ward; PAD: Patient Administration and Discharge; PHARM: pharmacy; PSY: psychiatric ward; TEMPER: tent, extendable, modular, personnel
Reproduced from: 12th Evacuation Hospital unit files, Army Medical Department Museum, AMEDD Center of History and Heritage, Fort Sam Houston, San Antonio, Texas.

US Marines and Arab forces would push straight into Kuwait, clearing out the Iraqis. In the west, a light US-French force would cut Iraqi supply routes into Kuwait. The main effort would be in the center, with VII Corps (four Army divisions and a British division) driving through Iraqi border forces and demolishing the Republican Guard. Because the Republican Guard was both the reserve for Iraqi forces in Kuwait and the main prop of Saddam Hussein's regime, the Coalition would both liberate Kuwait and create the conditions for Saddam's overthrow. But because the Republican Guard was made up of Iraq's best troops, VII Corps casualties were expected to be heavy: planners anticipated 2,000 wounded per day possibly for a week. Buses were leased and modified into ambulances to handle the large numbers expected.

To cope with these casualties, the 332d Medical Brigade eventually operated five combat support hospitals (totaling about 1,000 beds), five mobile Army surgical hospitals (totaling 300 beds), and five evacuation hospitals (another 2,000 beds). Clearly, if VII Corps accepted 2,000 casualties per day, postoperative casualties would need to be promptly evacuated to hospitals in the rear. McGuire worried whether enough ambulances and aircraft were available. The 332d also gradually built up a wide range of other units: a veterinary unit for food inspections, a psychiatric team to handle stressed soldiers, air and ground ambulance companies, a medical supply and maintenance battalion that could also manufacture spectacles, and other units that could provide minimal-care beds for lightly wounded or slightly sick soldiers.

NATO doctrine calls for each nation to provide medical support for its own soldiers, so the British division of the VII Corps had its own medical support. British soldiers came to the 12th when it was the closest hospital or they needed its specialized facilities, but they were quickly sent onward to a British hospital.

The 15 hospitals behind VII Corps comprised about a third of the 44 hospitals the Army deployed to Saudi Arabia, and a third of the Army's deployed hospital beds. Farther back were general hospitals to provide longer-term care, as well as casualty-staging facilities to transfer the wounded back to hospitals in Germany, or the Greek island of Crete, or the United States.

Hospital Operations

The 12th received its first patients on December 30, 1990, and until January 28, it was the only operational hospital in the VII Corps sector. General Norman Schwartzkopf, commander of Central Command, the American headquarters for the entire region, planned for both XVIII Airborne Corps and VII Corps to redeploy along the TAPLINE Road, moving northwest and much closer to the Iraqi border. Moving more than nine divisions, plus supporting units and supplies, along the four-lane road meant long hours and tired drivers who had to operate under blackout conditions. Because the 12th was about 2 kilometers from the TAPLINE Road, it received many patients who had been injured in road acci-

dents. Two to four accidents per night were common.

Moreover, although the 12th was operational on December 30, medical supplies were short, little blood was available, and patient evacuation was problematic. Patient care continued despite these problems; a mass-casualty situation occurred on the 31st when eleven injured soldiers (involved in a bus accident while travelling from another hospital) arrived for treatment, and two were admitted, although the first surgical case was not received until January 9. Replenishment of medical supplies remained uncertain; every bandage used or IV given was one less on hand, and if the Iraqis moved at all, the 12th could be out of supplies in a day.

Other than traffic accidents, most patients were sick, and plenty of sick patients arrived. Even without many combat units in the area (the combat units would arrive in the sector in mid-January) the support units for a whole Corps were in place. Instead of sending minor cases through clearing companies and area support medical companies, which were supposed to treat them, and referring only the serious cases to a hospital, the support units sent all sick personnel to the nearest hospital. On the first day the 12th was open, 129 patients arrived. The 12th Evac operated outpatient clinics and specialty services to handle all the patients, and morale was high. Working in the field also removed some peacetime restrictions, and the junior enlisted could improve their skills by performing tasks under supervision that they normally were not allowed to do.

The types of cases being seen were unexpected. Evacuation hospitals were intended to handle surgical patients and some disease cases. Most Army service members are young and healthy, without many chronic conditions, and pharmacies of deployed hospitals are stocked accordingly. However, soldiers (especially reservists, but the older active duty military as well) were going on sick call with high blood pressure, diabetes, seizure disorders, and asthma (which could be triggered by extra stress and the dusty environment in Saudi Arabia). The 12th also generated its own patients; almost all the staff came down with colds from crowded living conditions and the unfamiliar environment. Also, many more women were now deployed, and although one general medical officer slot was filled by a gynecologist, the pharmacy did not ordinarily stock medications for gynecological conditions. The variety of medical conditions kept the physicians busy and stressed the pharmaceutical supplies.

The 12th also handled serious cases and deaths. Soldiers died in accidents and from taking risks. After their foxhole collapsed on them, two soldiers were dug out and taken to the 12th Evac, where they arrived barely alive. The emergency section tried for 45 minutes, but could not save the men. Another pair of soldiers were watching lightning from the back of their truck, which made them the highest point in the surrounding desert, and they were struck and killed. One night a MEDEVAC helicopter, bringing in two British soldiers injured in a vehicle accident, misjudged the approach path and crashed into the 12-foot berm. One pilot* was killed, the other seriously injured; the patients were better strapped in, but

**After publication, the author was informed that it was a medic, not a pilot, who was killed.*

one of them (who already had a broken arm) had his other arm broken. The 12th established procedures for handling the dead, temporarily storing the remains in one of the refrigerated vans and contacting the nearest graves registration unit.

January passed with 51 surgeries, roughly 375 inpatients, and 2,100 outpatients. Although routines were established, including training programs for nurses, there were repeated alerts and military contingency plans. Negotiations with Hussein were unproductive, and it remained unknown whether he would launch a preemptive attack to disrupt the Coalition buildup. The 12th was fairly close to the border, and (before the Coalition combat divisions arrived) it would take Iraqi forces only an hour or two to reach them, very little warning time even if a warning was received. Major Tefft arranged a deal with Special Forces troops in the area: the 12th would provide medical help and supplies in exchange for prompt warning if a "bug out" were necessary. Colonel McGuire and the unit leaders drew up a plan for evacuation: an absolute minimum of staff would be left to care for patients, calibrated to the needs of the patients: a junior medic for minor cases, and a registered nurse for those in the intensive care unit and all other patients. Under the Geneva Conventions, medical equipment had to be left in place and operational, but generators, supplies, and nonmedical equipment could be destroyed. Some of the nurses did not like the idea of leaving their patients, but the Army had to consider their value as skilled personnel in what might be a longer war. Another issue if combat began soon was what to do with other arriving hospitals that were not yet operational. One option was to use them to augment the 12th, setting up extra wards as needed. The Iraqi attack never developed and these alternatives were never tested, but there were false alarms reaching up to VII Corps headquarters, including a report of an Iraqi brigade on its way towards Log Base Alpha, near the 12th.

Security plans involved more than "bugging out." Hussein had international support from Libya and the Palestine Liberation Organization, both of which sponsored terrorism. The 12th was protected from car-bombers by the sand berm, and enough guard posts were scattered around the perimeter to sound an alarm. The posts, plus roving guards, employed 45 enlisted personnel every night. Guards were located on military vans (MILVANs) positioned around the perimeter to see over the berm, and other MILVANs were used to dampen noise from generators, keeping noise levels lower at night. Inside the compound, tents were partly protected with sandbags. Chemical defense training included practicing donning gas masks and chemical defense suits. Soldiers took the training seriously, especially after the nearby crash of an F-16 jet, which sounded like a missile exploding and caused troops to mask-up for about 20 minutes (although it probably felt much longer).

Before dawn on January 17, the Coalition started a bombing campaign focused first on command-and-control targets in Iraq, and gradually extending to military targets in Kuwait. With the possibility that the Iraqis would respond with chemical weapons, all units prepared to work in chemical protective suits.

Chemical alarm systems were rigged, and some gave false alarms, in addition to the drills run to check reactions. The earlier alarms got much faster responses than later ones. The possibility of chemical warfare also caused the 12th to assess its situation as the only hospital available to support VII Corps: it was still short medical supplies and some equipment, short staff to handle full patient capacity, and concerned about the MEDEVAC system. However, the Coalition was still over a month from launching the ground war, and conditions improved (although flaws remained), especially as medical supplies started flowing. At times the 12th had to send teams (including the chief pharmacist, with enough rank to break logjams) to Dhahran to get supplies and equipment because the supply and transport system was not responding fast enough. As other hospitals arrived behind VII Corps, the 12th shared its expertise, especially about the supply system, by lending key people to help the newly arriving hospitals get established.

New equipment arrived, including new radiation machines and even a computed tomography (CT) scanner, the only one fielded to support VII Corps. CT scans were becoming the standard in civilian medicine, but the CT scanner proved a mixed blessing in the field. A generator had to be diverted to power it, which would cause a problem if the hospital was full or needed air conditioning. Moreover, although a CT scanner in some cases did a better job than an X-ray machine in locating fragments, it was often used to diagnose conditions such as chronic migraine headaches, problems an evacuation hospital should not be handling. Furthermore, as Colonel McGuire noted, the scanner's arrival when there was not even an adequate supply of bottled oxygen seemed like faulty prioritizing, as well as causing inappropriate expectations of definitive treatment in the field.

Because the 12th was the first hospital established, and because it had this specialized equipment, it was selected for augmentation with three medical teams: orthopedic surgery, neurosurgery, and anesthesiology. The 12th's strength ultimately peaked at 435, about 40 of whom were augmentations. Although plenty of staff was available for the work that developed, Colonel McGuire was initially concerned that the unit would not have enough nurses if the 12th cared for hundreds of battle casualties every day. A more critical problem was finding enough troops for guard duty and work details to guard the perimeter, make supply runs, collect trash, help the cooks, fill sandbags, and do any other work that needed doing, from repairs to improvements.

At the other end of the spectrum from advanced neurosurgery and CT scanners, the 12th established minimal care wards for patients who did not need regular monitoring. A substantial number of minor orthopedic injuries occurred, so an orthopedic ward was established. Another specialized ward was the psychiatric ward for soldiers with stress reactions to combat or the prospect of combat. The psychiatric ward was an ordinary tent, fairly similar to other living conditions in the field. As part of the standard treatment for combat stress, soldiers in

the ward were given some respite in addition to minimal duties, to reduce stress while keeping the soldiers reasonably close to the front, to keep them working and prevent brooding, and have them expect to return to duty.

VII Corps completed its move for the "left hook" around Kuwait in mid-February. In the last few days before the ground assault, the 12th received a few friendly fire casualties: five Americans injured when their vehicles were hit by missiles from an AH-64 Apache helicopter gunship. The first Iraqi prisoner arrived on February 23, captured during a Coalition probe the day before the ground assault began. As the ground war began on the 24th, problems remained with both medical supplies and spare parts as well the planned evacuation system.

The ground war lasted only 100 hours, far less time than expected. Following doctrine, the mobile hospitals (the combat support hospitals [CSHs] and mobile Army surgical hospitals [MASHs]) had moved forward behind the combat troops. However, since it took roughly a day to set up a MASH and several days to set up a CSH, these hospitals were barely used, and the 12th stayed busy. Dustoff helicopters brought patients straight back to evac hospitals, overflying the forward hospitals. However, the range of these helicopters was limited, and because of the longer evacuation, patient treatment was delayed when the helicopters had to refuel. On the other hand, battle casualties were relatively few (outnumbered by casualties of vehicle accidents) because of the Coalition's edge in technology, including body armor that stopped fragments. Originally the 12th did not expect to receive Iraqi prisoners (another hospital, about 30 km away, had been designated for them), but inevitably patients arrived in mixed groups. For a short period the 12th was ordered not to treat Iraqis, an order that staff ignored. The Iraqis were treated and placed on wards under guard by an armed medic (no military police were available). After a few weeks, with the fighting over, the Iraqis defeated, and the prisoners cooperative, the decision was made to withdraw the guards, and no problems developed.

Almost immediately after the ground fighting ended, more patients arrived: civilians, enemy prisoners, and Coalition and US troops. Despite the influx, the 12th had to staff only 104 beds of its 400-bed maximum. At first the civilians were Kuwaitis, but by March 23 Iraqi civilians began arriving, victims of the southern Iraqi rebellion against Saddam Hussein. The civilians arrived in large batches, Chinook loads of 30 or 40 at a time. Not all were patients; families often accompanied an injured member. This situation presented more of a nursing challenge than a treatment problem because the families expected to stay together and to help care for their loved ones. Spouses and children had to be accommodated, meaning a 40-bed ward could hold far fewer patients. Fortunately at least one of the general medical officer slots in the 12th was filled by a pediatrician, who had the necessary knowledge to treat the wounded children. Another cluster of patients were US soldiers wounded by ordnance they were clearing or trying to collect as souvenirs. One lieutenant put a souvenir underneath his truck seat that exploded and injured his legs and abdomen; surgeons

operated on almost every part of his body below the rib cage, eventually infusing over 50 units of blood, depleting the supply and requiring more blood donors. As is common in recipients of massive transfusions, the patient developed disseminated intravascular coagulation, with his blood no longer able to clot, and he bled all over, out of his orifices and through his skin. Despite multiple surgeries, the lieutenant ultimately died.

March was the busiest month of the war, with almost 800 inpatients and about 90 surgeries. On April 9 the 12th closed its doors to new patients, and the next day flew all remaining patients to hospitals at a Saudi base. In 101 days of hospital operations, the 12th Evac saw 10,309 outpatients and 1,299 inpatients; the average exceeded 100 per day, but the intensity of operations fluctuated. At final tally, 22 Iraqi prisoners, 130 civilians (both Kuwaiti and Iraqi), and 10 Coalition military personnel had been treated; the rest were Americans. Two patients died in the hospital, and a few others were dead on arrival.

Life in the Desert

Although the 12th Evac was in Saudi Arabia only from early December 1990 to the end of April 1991, staff had plenty of time to complain about the living conditions. Food was, as usual in the Army, a source of dissatisfaction. Many combat units were unable to set up kitchens, so troops were given MREs (meals, ready to eat). Other units faced the same restricted menu for days, then weeks. For almost a month, the troops of the 12th Evac had their choice of three prepared meals for breakfast, lunch, and dinner. Eventually the supply system started delivering more and different food. Because the 12th had borrowed two (unauthorized) mobile kitchen trailers, they were able to prepare more appetizing food. By the end of January there was also a mobile post exchange available at a nearby logistics base, so soldiers could get some personal items and snack foods for a change of pace.

Despite being in the middle of the Saudi desert, the 12th had reasonable links to and from the outside world. After initial problems in the mail system (including several changes of Army Post Office [APO] numbers, slowing deliveries), letters and packages began arriving with news, or cookies, or more socks. Americans back home sent care packages to "any soldier," which might appear at the 12th to brighten someone's day. The mail system back to Germany and the United States was better than incoming mail. Headquarters had telephones (including satellite telephones) for a limited number of outgoing calls, but most troops had to wait for periodic trips to telephone banks for calls home. Fortunately the 12th was fairly close to a phone bank, so there was seldom a long wait to make a call. *Stars and Stripes* was widely distributed. Colonel McGuire recalled that radio reception of the Armed Forces Network was spotty, but the British Broadcasting Corporation's world news came in well, providing all sorts of news.

Some amenities were available. The 12th was able to build fairly comfortable latrines (although the waste had to be burned daily, along with garbage and trash, producing unpleasant smoke for those downwind), and also had showers. Although the showers were erected fairly promptly, one of the delays amid all the priorities of getting the hospital operational was changing tents. Soldiers took showers whenever they had time, so men and women showered side-by-side. There were partitions, but those were only about shoulder-high. Even once male and female shower times were separated, incidents could arise; once the chemical alerts went off during shower time and women streaked back to their tents to get into protective gear.

Laundry equipment was available, but there were three problems. First, the equipment could handle hospital laundry only, not personal laundry. Because of the low number of patients, staff could run some personal laundry through the machines—except for the second problem. The equipment ran on diesel fuel and left clothes smelling of diesel, so most people washed their laundry in buckets. Overhauling the equipment might have taken care of the smell, but the equipment was so new there were no spare parts in the system. Additional, older laundry equipment was also available, and was used, but it also caused smells. Other types of equipment were built by staff of the 12th, led by Colonel McGuire's skilled carpentry.

Americans also had to adjust to Saudi Arabia's strict religious laws. For instance, women had to be modestly covered and escorted by men, and were prohibited from driving. Although the Army quietly bent the rules when troops were on duty, off-duty female soldiers visiting Saudi towns and cities had to conform. Many American soldiers were angered by the restrictions but followed orders. For the 12th Evac, stationed in the desert away from most towns, it was not a significant problem. Colonel McGuire allowed officers to visit the nearest town, Hafar Al-Batin, without any elaborate security measures—they did not need to wear helmets and armored vests or travel in groups. Other Saudi laws prohibited practice of religions other than Islam. The Saudis bent the law to allow Coalition troops to privately practice religion and decided that church services led by chaplains were acceptable as "morale services" led by "morale officers." The Saudis also allowed religious material to be sent through the mail beginning in December 1990. One law the Army embraced was Saudi Arabia's prohibition on alcohol. Central Command issued General Order No. 1, which banned alcohol (among other items) in the entire theater of operations. The Army's interest in the order was in reducing injuries, accidents, and disciplinary incidents. Similar General Orders have been issued for subsequent US military deployments.

The company commander decided that men and women would be separated for sleeping. (General Order No. 1 also prohibited sexual relations.) Colonel McGuire and the first sergeant regularly patrolled to enforce this order, discovering and breaking up "nests," which at least forced couples to find new locations.

Going Home

VII Corps had a firm policy of "first in, first out," which meant the 12th would be the first hospital in the Corps to head home. The firm dates involved little uncertainty: the unit would leave on a fixed date and could establish a timeline by counting backward. The 12th began packing up even while treating the last few patients. Reversing the process of setting up the hospital, when a minimal operating capability had been built first and then added to, soldiers gradually disassembled facilities until only the emergency medical treatment department was functional. Final packing occurred in the 5 days after the last patients were transferred out.

As the 12th shut down, all equipment had to be inventoried: everything that had been brought from Germany, locally purchased, or issued through chan-

Figure 4-3. Guidon of the 12th Evac, tattered from the desert winds. Photograph by the author.

nels was counted. Customs inspectors checked all items and then sealed the MILVANs. Transporters arrived to haul the containers away, and the 12th's own vehicles were driven to Dhahran to be washed before being loaded onto ships. Just before leaving, the old canvas GP tents (some had been in storage for decades), which had developed dry rot in the desert air, were burned. Most of the unit flew back to Germany. The first group, including many of the medical staff, flew back on April 22, while others flew on April 30. The 12th had deployed to Saudi Arabia wearing the European camouflage pattern, and Colonel McGuire declined the desert-pattern uniforms when they were finally available a few days before the return home: his people would go home in the uniforms in which they had proudly served. The Corps Support Command, located at Wiesbaden, organized a big welcome home party for troops and families. A small group of personnel went with the equipment to Dhahran to oversee its loading onto ships.

Deployment-Related Medical Concerns

The Army returned triumphant from Operation Desert Storm; the Iraqis had been driven from Kuwait, and at a light cost. Although the Army had sent 44 hospitals and about 24,000 medical personnel to Saudi Arabia, good medicine and good troop discipline had kept virtually everybody healthy. Daily sick and injured rates were about 4 per 10,000 soldiers, or 200 to 300 for the entire US force, and almost everyone recovered. Only four Americans of the 354 wounded in action died of their wounds, a phenomenal survival rate.

However, this success masked problems in the medical system. As the 12th found, it was hard to get supplies and spare parts to those who needed them. This problem was partly because the Army's systems had grown accustomed to supporting brick-and-mortar peacetime hospitals, and had trouble coping with medicine in the field. Sometimes an entire order would be cancelled if any item was out of stock, and sometimes requisitions were handled in the order in which they were received, regardless of priority or the availability of supplies. Supply problems resulted in "controlled exchange" (or cannibalization, or scrounging) of spare parts. Computers helped, but deploying computers and connecting them in the field was troublesome. Even after the 12th got its medical-supply computers working (the Theater Army Medical Management Information System, new in 1989, required processing forms at the unit and then taking a disk to the supply center), major problems remained. Just 10 days before the ground war started, only 3% of the 12th's supply requisitions and less than 1% of spare parts requisitions had been filled. Adding to the frustration and concern, the supply shortfalls were in critical items: radiograph film, narcotics, laboratory supplies, and injectible antibiotics.

Another issue throughout the AMEDD was how the PROFIS system worked, especially for unit commanders. Deployable hospitals had a peacetime commander from the Medical Service Corps, not a physician; on mobilization, this

person became executive officer and a physician took command. In the 12th this had created problems: Colonel McGuire had not anticipated taking command, and Lieutenant Colonel East no longer had his peacetime authority, putting both in a difficult situation. Lieutenant Colonel East's health failed under the stress of the deployment, and he had to be replaced. When the Medical Corps (ie, the physicians) reviewed the situation, their conclusion was that hospitals needed a physician in command because "only a doctor can be fully responsible for the delivery of patient care." However, the physicians realized that some hospital commanders were not ready for the job (although they phrased it as some being better prepared than others) and should be pre-selected and trained in what the command of a deployed hospital involved. At a higher level, the AMEDD was willing to say that some physician commanders were "inappropriately selected and poorly prepared," noting the disruption and damage to morale that ensued when a peacetime commander was superseded. This dispute briefly swirled around the AMEDD, resulting in the establishment of boards (consisting of qualified AMEDD officers regardless of their corps) to select hospital commanders, who would take a command course.

The Army also faced concerns about veterans' health. Various immunizations were given against both disease and Iraq's potential biological weapons, while Iraq was known to have chemical weapons. Unfortunately, with the rush of deploying, the military did not adequately document all the vaccinations. Moreover, soldiers were exposed to a variety of chemicals in Kuwait, Iraq, and Saudi Arabia (the 12th Evac was downwind when some Iraqi chemical rockets were destroyed after the fighting), yet this exposure could not be readily documented either. In response to Gulf War veterans' concerns, the Department of Defense instituted the Comprehensive Clinical Evaluation Program. Findings from systematic and comprehensive examinations of 20,000 US Gulf War veterans were analyzed. Among 20,000 participants, the types of primary and secondary diagnoses varied widely. Some veterans had symptoms, signs, and ill-defined conditions, but no single subcategory of illness predominated, and no characteristic physical sign or laboratory abnormality was identified. No clinical indication of a new or unique illness was identified in this self-referred population, and the types of physiologic disease that could result from postulated hazardous wartime exposures were uncommon. The military's response was threefold: investigate whether there might be a single cause of the reported symptoms; diagnose and treat each individual's problems; and implement vastly better predeployment and postdeployment health checks. After this period, the military screened returning soldiers to get help to those with a high risk of health problems.

Converting to a MASH

When the 12th arrived in Germany, the PROFIS and enlisted medical personnel returned to their clinics and hospitals, and unit staffing plunged back to

about 25% overall and 50% of nonclinical personnel. The soldiers assigned to the 12th had a new barracks, still at Wiesbaden. Paperwork had to be done for everyone who had gone to Saudi Arabia, including personnel evaluations and awards. Equipment began trickling in, and much of it required overhaul. For instance, many trucks had gotten sand into their oil systems, which had to be purged before the grit destroyed the engines.

Concurrently, the 12th Evac was converting into the 212th MASH (a 12th MASH already existed). Major Tefft, the senior nurse assigned to the 12th, had a wealth of experience with the unit and previous experience in another deployable hospital, so he was offered command of the 212th and accepted. The troops remaining in the unit had just spent 4 months in Saudi Arabia, so training levels were high. For several months the unit's containers and crates of equipment trickled in, a few at a time. Some items arrived so late they were no longer needed and were repacked and shipped back to the United States for storage. A team from the Army Medical Materiel Agency arrived shortly after the inventory was complete and checked the unit inventory against the MASH authorizations, noting shortages. The new unit had a high priority, so new items were soon arriving.

Also arriving were the senior NCOs assigned to a 60-bed MASH; sergeants first class and master sergeants took over responsibilities of the evac's staff sergeants. The new personnel made life easier for the relatively junior officers who led the unit during peacetime. Also, teams of soldiers and government civilians were assigned to help overhaul the old equipment and issue the new; the Army had not yet trimmed uniformed support personnel in favor of civilian contractors. The 212th was allowed 6 months to convert to a MASH; during this time the unit did not need to maintain readiness. Not enough equipment was available to run substantial exercises, but Major Tefft used smaller activities, such as supporting an international 4-day marching competition in Nijmegen, Holland, to keep his troops in practice.

Behind the Scenes: Demise of the MASH Concept

To understand the type of unit the 12th Evac was converting into, and why the 212th became the only MASH in the Army, it is necessary to look into some of the Army's behind-the-scenes processes. The original 1945 MASH design planned for an austere 60-bed hospital for urgent surgical patients. However, as MASHs were used in Korea and Vietnam, they accumulated equipment and personnel to the point that mobility was compromised and they essentially became smaller evacuation hospitals with a range of capabilities.

From the mid-1970s into the early 1990s, Army combat doctrine and organization were evolving. The Army had to adapt to the end of the draft (resulting in fewer people in uniform) and an increasing Soviet threat (as the Soviet Union deployed new equipment that matched NATO capabilities), while incorporating combat experience from the US participation in Vietnam and the performance

of American and Soviet equipment in the 1973 Arab-Israeli War. In 1976 the Army published its new doctrine of "active defense," which then became the "AirLand Battle" doctrine in the early 1980s. These doctrines planned for a fair amount of maneuver at the brigade level, so the Army overhauled the structure of the combat divisions. Instead of support functions (for instance, maintenance and medical) being organized in battalions at the divisional level, the divisional battalions were broken up, with each combat brigade in the division receiving a multifunctional support battalion.

Even earlier, the AMEDD had reconsidered its unit structure; in 1971 the MASH and the evacuation hospital were being considered for replacement by a new CSH, which would be both mobile and capable, with 200 beds. However, the CSH was not tested until 1977, when it was found to have a number of problems, including poor mobility. The AMEDD switched back to the MASH, revising the 60-bed version that had been deployed to Vietnam. The new MASH structure included lighter equipment but more personnel. The AMEDD had to balance its personnel and funding with the new active defense and AirLand Battle doctrines, and ultimately both the CSH and MASH, despite their drawbacks, were used. The AMEDD needed to address the flaws of the 60-bed MASH, especially its lack of mobility; however, these changes were delayed in favor of other requirements identified by the Health Service Support for AirLand Battle (HSSALB) process.

In the 1980s, the HSSALB plan became the "Evolving Medical Force" process, and then the "Medical Force 2000" redesign of field units. By 1988 higher-priority items had received attention, allowing time to reconsider the MASH. At the time, the Army assumed that more destructive weapons arriving on the battlefield would increase the number of patients needing forward surgical care. The MASH could be part of the solution to increasing numbers of patients, but its mobility problems had to be solved. The first plan was to keep the MASH essentially the same but make it more mobile, basically by chopping it in half. Instead of 60 beds, it would have 30, and personnel would decrease from 269 to 133. The new unit was designed to accept 15 patients per day for life-saving surgery, then hold them on the wards for 24 to 36 hours before they were evacuated to a CSH. The MASH was supposed to receive only certain types of patients: those needing abdominal, orthopedic, chest, or neck surgery, and patients with severe bleeding. Embedded in the unit would be a group (termed the hospital unit, surgical, forward, or HUSF) of about 25 personnel who could take an operating room and an intensive-care ward (with elements of the pharmacy, medical supplies, radiation, and EMT) and move separately on the battlefield, functioning for 2 days before resupply.

These plans abruptly hit an obstacle. The Defense Medical Standardization Board, which approved medical materiel sets for all new deployable hospital designs, failed to address the plans for 4 years, effectively preventing the Army from testing the new design.

Meanwhile, the AMEDD was building momentum in a different direction. When the United States replaced a Marxist government on the Caribbean island of Grenada in 1983, the 82d Airborne Division sent two brigades, but chose not to take a MASH or any ad hoc surgical capability. Aircraft space was too limited for the 60-bed MASH, so other units got priority. The lack of surgical capability in that deployment led to some experimentation in following years, and in 1986 the result was a surgical squad that could operate on patients but relied on a medical company to care for them until they could be evacuated to a hospital. In 1989, when the 82d Airborne was part of the intervention in Panama against dictator Manuel Noriega, a surgical squad was deployed and worked well. The squad performed surgeries and handed patients over to a medical company for care until they could be flown out, according to plan. Surgical squads (now also called forward surgical teams, or FSTs) also deployed to Saudi Arabia for Operation Desert Shield in 1990. Meanwhile, as the GAO noted, the MASH had proved too slow in Saudi Arabia. In 1992 the AMEDD Center & School decided the future lay with FSTs, which would replace the MASH and be "*the* means of stabilizing severely wounded soldiers who require immediate surgery." After a few years in which they were formally organized and equipped, FSTs were ready for deployment in 1997. FSTs solved one medical problem by being easily deployable: with only 20 people and four vehicles, FSTs required only one or two transport aircraft (if no vehicles were taken, only one C-130 Hercules flight was necessary).

MASHs were still necessary before the new FSTs were ready (and support hospitals would be necessary even after FSTs deployed), so the Army again reexamined the unit between September 1992 and early 1993. The 30-bed MASH was finally tested at Fort Bragg, North Carolina, by the 5th MASH, which spent 10 days of September 1992 in thorough field tests. The 5th MASH was able to pack its gear and load its trucks in 12 hours; the HUSF was able to pack up in 2 hours. Both elements could set up on a new site in 6 hours, meeting the test criteria. However, shortcomings remained, such as the lack of transportation, and six trucks were added, bringing the unit's total to 37 trucks (31 for cargo, 6 for passengers) and five light vehicles (two M998 high-mobility multi-wheel vehicles and three M1008 military pickup trucks). Ten of the trucks towed trailers. Another truck towed a container on a "dolly set," essentially pairs of wheels that could be latched onto a standard shipping container for towing. Dolly sets had limited ground clearance and were hard to maneuver, but were cheaper and more flexible than using flatbed trucks to move containers. Another issue raised was the type of tents used: DEPMEDS tents were heavier and took longer to erect than simple canvas general purpose tents, but enabled better patient care. Still another concern was that the hospital administration and command sections had only marginally enough personnel, possibly not enough for prolonged operations. Finally, the MASH needed both more heater/air conditioner units and more generators. Most solutions to these problems involved more people and

equipment, making the unit bulkier and heavier, which would negatively affect mobility.

Another problem was the unit's mission: the MASH was supposed to receive only certain types of surgical patients, but on the battlefield it would be extremely hard (if not impossible) to send only these patients to the MASH. Especially if the unit was called a hospital, it would inevitably get some patients for whom it lacked staff and equipment. The MASH was intended to treat only 43 of over 300 diagnoses, some of which could be determined only after surgery began; therefore, it was impossible to identify these cases on the battlefield based on a short radio call from a combat medic. The evaluation team decided that the MASH was really "a large surgical team" rather than a hospital, and because it would inevitably get some "wrong" patients, it would have to improvise.

On the positive side, the evaluation group liked the HUSF organization, and suggested breaking up the MASH into three HUSFs. This structure would resemble the surgical squad/FST, except that it would have an integral intensive-care ward. Also, the MASH was clinically acceptable: it had the medical staff and equipment to perform forward resuscitative surgery.

Concurrently with the 5th MASH's field tests, events were moving on two other fronts. First, the Defense Medical Standardization Board had approved the MASH's medical equipment sets. Second, the Army planned for ten new MASHs, based on allotting two MASHs per corps. Three were in the National Guard, one in Korea, two in Germany, and four in the active duty Army in the United States.

Yet the field tests had uncovered enough problems that the Army held back on deploying the planned units. The 30-bed MASH had personnel problems and needed the extra six vehicles to be fully mobile. The AMEDD quickly examined some alternatives: would a 24-bed or a 36-bed unit be viable with the same personnel? The 24-bed version was judged wasteful of personnel. Deputy Surgeon General Thomas Tempel wrote to the Deputy Chief of Staff for Operations that the 36-bed version was "a fully mission capable hospital," and a draft table of organization and equipment was quickly produced (the personnel shortages in the 30-bed version were not in nursing staff, so the hospital could handle slightly more beds with the same headcount.) But neither version addressed the real problem: the unit was still fairly bulky and heavy, especially with the extra trucks. Because of this problem and the impending deployment of the FST, only the 5th MASH (which would be inactivated in 1997) and two in Germany (the 212th and 502d) were converted to the 36-bed format. Additionally, the post-Cold War drawdown was underway and USAREUR was losing personnel; not enough medical staff were available for CSHs, so keeping the MASH was the only option.

In September 1993, Major General William Moore Jr, commander of the AMEDD Center & School, declared the MASH was "not . . . a viable organization" because it was too heavy and bulky to readily deploy. Ultimately it would

be replaced; FSTs would handle forward surgery and CSHs would provide more complex surgery and hospital wards. It was the death-knell for the concept of the MASH. The 212th and 502d had a brief stay of execution because of USAREUR's personnel situation; the 502d was inactivated in 1994 as USAREUR continued its reduction, and it was left to the 212th to prove whether the MASH was a viable organization, even as it was ultimately slated to disappear.

Sources

This chapter is based on oral histories (see appendix); various AMEDD after-action reviews; unit documents provided by Colonel Mike McGuire and others; and Schubert FN, Kraus TL, eds, *The Whirlwind War: The United States Army in Operations DESERT SHIELD and DESERT STORM* (Washington, DC: US Army Center of Military History; 1995). General information on medicine, including the PROFIS system, in Desert Shield/Desert Storm is in *Conduct of the Persian Gulf War* (Washington, DC: Department of Defense; 1992) and GAO report T-NSIAD-92-8, *Operation Desert Storm: Full Army Medical Capability Not Achieved* (February 5, 1992). Richard W Stewart, ed, *American Military History, Vol II: The United States Army in a Global Era, 1917–2003* (Washington, DC: Center of Military History; 2005) provides a general overview of changes in the Army. Michael Gordon and Bernard Gordon's *The General's War: The Inside Story of the Conflict in the Gulf* (New York, NY: Little, Brown and Co; 1995) and Bob Woodward's *The Commanders* (New York, NY: Simon & Schuster; 1991) have minor pieces of information. The Department of Defense website, www.gulflink.osd.mil, has information on immunizations.

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3. Memorandum, Commander AMEDD Center & School to The Surgeon General. *Thirty-Bed Mobile Army Surgical Hospital (MASH) Force Development Evaluation Report*. 13 September 1993.

Copies of this material are on file in the historical research collection of the Army Medical Department Center of History and Heritage, Fort Sam Houston, Texas.