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OPERATIONS REPORT LESSONS LEARNED

REPORT 2-68

MEDICAL LESSONS LEARNED





DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

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Kenneth G. Wickham

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SECTION I

MEDICAL TREATMENT AND PROCEDURE

1. ITEM: Treatment of malaria. (670600)

DISCUSSION: A major revision in the treatment of vivax and falciparum malaria has been formulated in USARV as a result of the following trends observed over a period of several months:

a. The rising incidence of vivax malaria in excess of 10 percent of all clinical malaria, with the implication this conveyed in respect to individual malaria discipline.

b. The need to obtain factual data concerning the minimal effective treatment of falciparum malaria in order to minimize adverse, and occasionally serious, reactions to drugs used; and to return patients to duty as soon as possible without risk of relapse.

(1) In the treatment of vivax malaria, it was learned that relapses approximated 8 percent with conventional three-day chloroquine therapy and reinstitution of the weekly chloroquine-primaquine tablet. The relapse rate was reduced to less than 1 percent after the treatment was modified to add primaquine in dosage of 15 mgm daily for 14 days.

(2) The treatment regimen for falciparum malaria was evaluated in a study conducted at the 6th Convalescent Center. One hundred and forty-one patients were divided into two equal groups and placed on a 10- and 14-day triple drug regimen with equal dosage of quinine and dapsone. Daraprim was used in reduced dosage in one group (50 mgm daily for three days) and in conventional dosage in the other (75mgm daily). The results clearly indicated that the 10-day regimen was as effective as the 14-day regimen since no relapses occurred. Equally important, there were no adverse reactions to drug therapy with the shorter regimen whereas there were three complications with the longer treatment schedule.

OBSERVATION: If the premise is accepted that vivax malaria can be adequately suppressed with weekly chloroquine-primaquine therapy (there may be at best a 10-percent breakthrough), then World War II must be the source for malaria lessons learned. The most important lesson was that "it is impossible to control malaria effectively in military forces engaged in highly malarious areas unless commanding officers from the highest to the lowest echelons are malaria conscious. Training and education of both medical and line officers with regard to malaria and its control is essential. Malaria discipline is absolutely essential if an army is to engage successfully in battle. Malaria control in the Army is a military problem."

2. ITEM: Disposition of splenectomy patients. (681044)

DISCUSSION: The present USARV policy with respect to soldiers without a spleen is as follows: a P-3 profile will be assigned with specific instructions to areas where the risk of acquiring falciparum malaria is low. Such areas are generally located in the well-established military bases along the coast. In addition, all cases will be monitored so that the desired experience factors can be compiled.

OBSERVATION: While certain inferences can be drawn from animal experimentation, there is insufficient data with respect to the effect of splenectomy upon human malaria. Until such time as experience dictates otherwise, the above policy for splenectomy patients will prevail.

3. ITEM: Incidence of chloroquine and quinine resistance in Plasmodium falciparum malaria. (650003)

DISCUSSION: Of the patients treated with chloroquine alone, 94% were resistant and relapsed in an average of 8 days.

Of the patients treated with quinine alone, 69% were resistant and relapsed in an average of 14 days.

Of the patients treated with a combination of these two drugs, 62% were resistant and relapsed in an average of 13 days.

OBSERVATION: The 9th Field Hospital reported (January 1966) that repeated courses of quinine appeared to be effective in controlling each attack. However, relapses were seen as soon as 2 days following a course of 30 grams of quinine given over a 10-day period. In several cases, the patients' responses appeared to be dose related, i.e., the patients became afebrile and asymptomatic on 3 grams of quinine daily and relapsed when the dose was dropped to 2 grams daily.

4. ITEM: Recognition and treatment of complications of falciparum malaria. (650010)

DISCUSSION: The 85th Evacuation Hospital reported (January 1966) that the two most frequently serious complications of falciparum malaria are: 1) acute renal failure with or without Blackwater fever, and 2) acute brain syndrome. The former may be occult (without dark urine). The latter may be present in a variety of ways but is often heralded by severe headache, somnolence, disorientation and extreme lethargy with or without localizing signs. The two most useful prognostic signs are: 1) duration of illness before recognition and treatment, i.e., the longer the period of symptoms, the greater the possibility of complications, and 2) the degree of parasitemia.

OBSERVATION: It is suggested that careful recording of intake and output be accomplished at least for the first two days of hospitali-

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zation. Severely ill patients have a propensity to retain water in excess of body needs in the presence of increased thirst. The search for presence of other disease complicating malaria is also imperative in the severely ill patient. Rapid recognition and treatment of early complications improves prognosis considerably. Prompt evacuation of patients with a rising BUN to a facility where dialysis is available is requisite to a successful outcome. Intravenous quinine is the drug of choice for severely ill patients, even in the presence of Blackwater fever.

5. ITEM: Antibiotic resistance in Shigella infections. (650003)

DISCUSSION: Resistance to tetracycline was found in 39 of 60 cases of Shigella flexneri, in 14 of 32 cases of Shigella sonnei and 1 of 3 cases of Shigella dysenteriae.

Resistance to chloromycetin was found in 5 of 60 cases of S. flexneri, in 4 of 32 cases of S. sonnei and in 1 of 3 cases of S. dysenteriae.

Resistance to neomycin was found to exist in 2 of 60 cases of S. flexneri and none in the cases of S. sonnei and S. dysenteriae.

OBSERVATION: In future treatment regimes for Shigellosis, use of an antibiotic combination such as neomycin and polymycin should be considered.

6. ITEM: Scrub typhus. (650003)

DISCUSSION: Twenty-nine patients were treated for scrub typhus. Of these, five relapsed and three required longer than 60 hours to respond to treatment.

OBSERVATION: The 9th Field Hospital reported that experience indicated the best treatment regimes are:

a. Chloromycetin in the amount of 1 gram every hour for 3 doses followed by 1 gram every 8 hours until a total dosage of 16 grams has been administered.

b. Chloromycetin in the amount of 1 gram every hour for 3 doses followed by 1 gram every 8 hours for a total dosage of 12 grams. This in turn followed by a prophylactic dose of 3-4 grams given 3 to 4 days after completion of the initial treatment. Contrary to the commonly accepted average relapse figure of 8 days following discontinuance of treatment, relapses occurred on an average of 4 days (range: 2-5 days).

7. ITEM: Recognition and treatment of scrub typhus. (650010)

DISCUSSION: Infection by rickettsia tsutsugamushi is a common disease in Vietnam. Typically, the patient will have unexplained fever, headache and other systemic symptoms with repeatedly negative malaria smears. A careful search over the entire skin surface for ulcerations, bites and especially an eschar is necessary and highly profitable.

OBSERVATION: Treatment with tetracycline for five to seven days is suggested. Although shorter periods of therapy may be employed, the slightly longer duration of therapy is advisable to prevent relapses. On such treatment, the patient should be afebrile in from 12 to 48 hours or another diagnosis must be entertained.

8. ITEM: Leptospirosis. (650003)

DISCUSSION: A total of 9 cases of leptospirosis was diagnosed and treated with one fatality due to fulminant hemorrhagic pneumonia.

OBSERVATION: Although leptospirosis is usually a mild, flu-like syndrome, it can be fatal, and every effort should be made to prevent rats from contaminating food. Suspected cases of leptospirosis should be hospitalized immediately and given appropriate therapy.

9. ITEM: Recognition of prostatitis. (650010)

DISCUSSION: Numerous cases of prostatitis have been referred to field and evacuation hospitals with diagnosis of pyelonephritis, refractory "UTI," low back pain and persistent urethral discharge. It is strongly suggested that personnel who complain of low back pain, urethral discharge or have abnormal sediment findings on urinalysis be carefully examined rectally for the presence of prostatitis.

OBSERVATION: Good results have been achieved by the use of therapeutic doses of tetracycline and frequent prostate massage for a period of 10 to 14 days. Lack of response or complications make urological consultation advisable. Proper diagnosis will preclude unnecessary transfers to hospitals, thus saving manhours.

10. ITEM: Use of streptomycin. (650010)

DISCUSSION: A number of patients with pulmonary infiltrates or hematuria were treated with streptomycin where the diagnosis of tuberculosis might have been suspected.

OBSERVATION: It is strongly suggested that streptomycin not be used to treat pulmonary or genitourinary infections unless a careful search to exclude tuberculosis has been carried out. Such treatment greatly prolongs the period of observation to exclude tuberculosis as a possible diagnosis.

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11. ITEM: Modified Tobruck Splint. (650010)

DISCUSSION: A modified Tobruck Splint has been used in the transportation of fracture of the femoral shaft and supracondylar area.

OBSERVATION: The modified Tobruck Splint should be considered the method of choice for transporting fractures of the femoral shaft, distal half. Patients tolerate transportation well, and the method has the advantage of maintaining skeletal traction during transit.

12. ITEM: Hepatic abscesses, a serious complication of amebiasis in the combat zone. (660187)

DISCUSSION: The 36th Evacuation Hospital reported (August 1966) that three patients with amebiasis complicated by hepatic amebic abscesses were treated with one fatality. Two patients presented with solitary abscess formation in the right lobe. These were managed successfully with open drainage in an extra-pleural, extra-peritoneal fashion. One patient presented with multifocal abscesses and severe ulcerative and granulomatous lesions of the colon. Despite open drainage and colostomy, the patient expired. All patients were treated with: Emetine, 65mgm daily; Cholorquin, 300mgm, intramuscularly, daily; Diodoquin, 650mgm every 8 hours; and Tetracycline, 2gm daily.

OBSERVATION: Based on this experience, the 36th Evacuation Hospital submitted the following conclusions and observations:

a. Hepatic amebic abscesses may be managed successfully with open drainage. The extra-pleural, extra-peritoneal approach is preferred. Liver abscesses may present with signs of extra-hepatic biliary obstruction and inferior venacaval obstruction. Multifocal liver abscesses were present in one patient. Signs of colon obstruction may be present secondary to ulcerative stenotic lesions as well as granulomatous lesions, necessitating proximal colostomy. The stenotic lesions and granulomatous lesions are difficult to differentiate from carcinoma by palpation.

b. Barium enema is a valuable adjunct to the diagnosis and management of patients with evidence of colon obstruction secondary to amebiasis.

c. It is advisable to include Emetine in the therapeutic regimen of patients with amebic dysentery.

d. Patients developed signs of hepatic abscesses despite presumably adequate intestinal amebicidal therapy of Tetracycline and Oiodoquin.

13. ITEM: Merthiolate-Iodine-Formalin solution to preserve stool specimens. (660385)

DISCUSSION: Fresh stool specimens were submitted to a laboratory on a casual basis. Because of the delay in getting material from the wards to the laboratory, as well as delay in examining the specimen once it had reached the laboratory, the yield of parasites was relatively low. The use of MIF solution for immediate preservation of specimens in the ward was instituted.

OBSERVATION: This collection technique enabled the laboratory to examine all specimens in a "fresh" state. In addition, the fixed specimen presents less of a health hazard to personnel who must handle the material.

14. ITEM: Evacuation of patients in bivalved spica cast. (670093)

DISCUSSION: Physicians in Vietnam have been informed that, in accordance with the NATO handbook and USARV regulations, casts must be split prior to evacuation. The 36th Evacuation Hospital has received several patients in hip spica plasters which have been bivalved, broken, completely non-fitting and completely without fracture immobilization. Patients' conditions are aggravated and sometimes worsened. Hip spicas (and most other plasters as well) should be monovalved, not bivalved. It is also recommended that the cast splitting reach only to mid-thigh; if higher, the cast will probably break (applies to hip spica only).

OBSERVATION: Hip spica plasters should not be bivalved prior to patient evacuation. This generally results in complete loss of fracture immobilization.

15. ITEM: Radiographic priorities on "immediate" category in mass casualties. (660385)

DISCUSSION: When several patients of the "immediate" category are in the pre-op ward, one person should determine the order in which to X-ray the patients. A physician will often attempt to place his patient before others--generally unaware of other patients' conditions. The 36th Evacuation Hospital reported utilizing the senior surgeon to establish the order, writing the patient's numerical order on the card already affixed to his chest for other surgical notifications.

OBSERVATION: X-ray priorities must be established to preclude confusion and to insure that patients are treated in the proper order.

16. ITEM: Popliteal artery repair. (660391)

DISCUSSION: Two patients were transferred to the 3d Field Hospital with popliteal artery repair without a fasciotomy of the leg. Both patients required a fasciotomy to relieve the compartmental pressure secondary to edema. One of the patients eventually required an amputation.

OBSERVATION: Patients who require a fascular repair below the hiatus of the femoral canal develop a tremendous amount of edema of the leg which compresses the vascular supply to the muscle compartments causing necrosis. This does not happen if a fasciotomy of the leg compartments is done. Therefore, a patient who has a vascular repair below the hiatus of the femoral canal should have a fasciotomy of the leg compartments prophylactically unless he is to be under the care of the operating surgeon the first seven days post-operative.

17. ITEM: Blood recipients. (670094)

DISCUSSION: In some instances, patients have received blood transfusions of a type other than their own. This can make cross-matching for subsequent, necessary transfusions very difficult and compound the attending physician's problems.

OBSERVATION: Careful consideration as to blood type must be given to each case where transfusions are necessary.

18. ITEM: Deterioration of ophthalmic preparations. (660385)

DISCUSSION: The 36th Evacuation Hospital's Ophthalmology Clinic noted that the condition of some of the ophthalmic preparations seemed to be effected by the heat.

OBSERVATION: Refrigeration of ophthalmic preparations will prevent their deterioration.

19. ITEM: Oxygen therapy in the severely wounded. (670092)

DISCUSSION: It has been known that pulmonary trauma leads to arteriovenous shunting with resultant hypoxemia and acidosis. In conjunction with the WRAIR team, blood gas studies have been performed on all patients with severe high velocity soft tissue trauma.

OBSERVATION: Preliminary observations reveal arterial de-saturation from shunting in these patients, suggesting that supportive pre- and post-operative oxygen therapy is indicated. Oxygen therapy is easily administered via nasal catheter.

20. ITEM: The respiratory stimulant Doxapram. (660385)

DISCUSSION: Doxapram hydrochloride (Dopram), a respiratory stimulant, has been successfully used by the 36th Evacuation Hospital to treat post-anesthesia patients, as a differential test for residual curarization and as a means of freeing more personnel in the triage situation when patients are brought in with respiratory depression. Single intravenous drip of 0.3mgm% solution has been used in the latter instance.

OBSERVATION: Both modes of administration result in three- to four-fold increases in the tidal volume as measured by a Wright respirometer. Dopram appears acceptable as a standard item in the anesthesia department and triage areas.

21. ITEM: Methoxyflurand (Penthrane). (660187)

DISCUSSION: The 36th Evacuation Hospital reported that Methoxyflurand is an excellent anesthetic agent.

OBSERVATION: This is a versatile, non-flammable anesthetic agent which can be used safely and economically with the No. 8 Heidbrink vaporizer.

22. ITEM: Saphenous vein cutdowns. (670094)

DISCUSSION: Vein cutdowns are being done too indiscriminately causing difficulty in maintaining central venous pressure. Also, the transfusion may be relatively ineffective if a patient is bleeding from a visceral wound.

OBSERVATION: The use of upper extremity routes for rapid infusions instead of saphenous vein cutdowns would be more effective in most cases.

23. ITEM: Treatment of acidosis. (670092)

DISCUSSION: Patients entering in severe circulatory collapse that has been present for any significant length of time usually manifest severe metabolic acidosis due to inadequate peripheral tissue perfusion. Arbitrary or empirical therapy with alkalizing fluids (sodium bicarbonate or tris-buf---) is inadequate as has been determined by arterial blood gas studies.

OBSERVATION: All patients with metabolic acidosis are restored--normal Ph via serial arterial blood gas studies--as a routine resuscitative measure. These studies should be available in all hospitals (Surgical, Field and Evacuation) to provide definitive therapy to the severely wounded.

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24. ITEM: Treatment of fungal dermatidities with Griseofulvin. (670470)

DISCUSSION: The fungal dermatidities are among the most common problems seen on routine sick call. Included in this category are tinea corporis, tinea cruris, epidermophyton infections and non-specific external otitic infections. Although local medications have generally proven to be useful in treating these conditions, the moist, dusty climate encountered in Vietnam has tended to make treatment by this method both impractical and prolonged.

OBSERVATION: Experience has shown Griseofulvin to be very effective in the treatment of the type fungal dermatidities encountered in Vietnam. All patients presenting any of the above problems are begun on Griseofulvin 100mgm potid, as well as local anti-fungal medications. On this combined regimen, there has been a remarkable increase in cure rate and decrease in time of treatment necessary. The patient is put on a one-week course of Griseofulvin, and there have been no cases to date of toxic hemotological reactions to this dose regimen.

25. ITEM: Intracaths. (660122)

DISCUSSION: Intracaths have been used in Vietnam with a high degree of success. In combat situations, first aid and resuscitative care require the rapid administration of blood and intravenous fluids without resorting to time-consuming methods of venous cutdown.

OBSERVATION: Use of plastic intracaths or venocaths offers the physician and/or aidman a quick action method of administration of fluids.

26. ITEM: Positioning of urethral catheters. (670512)

DISCUSSION: The taping of urethral catheters to the legs of male patients caused kinking of the catheter with resultant obstructions to urinary flow and subsequent infection.

OBSERVATION: Taping catheters to the abdomen rather than the leg decreased the problem of kinking and resulted in better urinary drainage and less infection.

27. ITEM: Adjuncts to arterial surgery. (670559)

DISCUSSION: In patients undergoing re-exploration of a femoral artery repair, it has been noted that the use of conduction anesthesia has greatly reduced spasm in the affected artery.

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OBSERVATION: Continuous, epidural anesthesia provides sufficient anesthesia to allow re-establishment of flow while a chemical sympathectomy is accomplished.

28. ITEM: Fragmentary chest wounds. (674064)

DISCUSSION: Patients with penetrating fragment wounds of the chest who are found normal by physical and X-ray examinations should be followed extremely carefully both by frequent auscultation and X-ray.

OBSERVATION: As late as 3 or 4 days after injury, a number of these patients have developed hemothorax, pneumothorax, or both. Small fragments in the chest may not cause trouble until several days after the injury, thus such injuries should be monitored.

29. ITEM: Treatment of cerebral edema. (670512)

DISCUSSION: Cerebral edema is a significant problem in brain injuries. To reduce this complication, three methods are used concomitantly:

a. Ice water irrigation and bathing is used during operations directly on the brain surface.

b. Mannitol is used as a diuretic.

c. Generalized hypothermia is used post-operatively.

OBSERVATION: These techniques have lowered the mortality and morbidity rates significantly in head injury cases.

30. ITEM: Management of massive hemothorax. (670559)

DISCUSSION: The 3d Field Hospital reported that penetrating wounds of the chest with resulting hemothorax and hemorrhagic shock are customarily treated with immediate closed tube thoracostomy and whole blood replacement.

OBSERVATION: In most patients, this treatment is adequate; however, a few patients have major vessel injury, and the hastily inserted chest tube serves as a vent for exsanguinating hemorrhage. The tamponade effect of the hemothorax is lost and uncontrollable bleeding occurs.

31. ITEM: Tracheostomy care. (670512)

DISCUSSION: Thick secretions often encountered in patients with tracheostomy prevent proper tracheostomy care and aggravate pulmonary problems.

OBSERVATION: It has been found that the addition of a medication mucomyst to the oxygen moisturizing apparatus will lower the viscosity of the secretions.

32. ITEM: Assessment of missile fragment wounds of joints. (670559)

DISCUSSION: The 3d Field Hospital observed several cases of pyogenic arthritis resulting from failure to identify small missile fragments in the knee joint.

OBSERVATION: Medical personnel should be aware of the possible complication of a pyarthrosis in all extremity fragment wounds.

33. ITEM: Quinine studies and blackwater fever. (670559)

DISCUSSION: The 629th Medical Detachment (Renal) reported the following results from on-going studies of "in vivo" and "in vitro" quinine clearance data.

a. In Vivo (in human body) data: Data have been analyzed for quinine assays in four patients with acute falciparum malaria and blackwater fever. Peritoneal dialysis has been used as the method of therapy for the renal failure in each case. Data on three such cases have been tabulated in a preliminary fashion, and some general conclusions can be derived from these results. In the anuric or markedly oliguric phase of renal failure, it would appear that one-third (600 mg) of the normal dosage of quinine dihydrochloride produces an efficacious therapeutic serum level. Levels achieved at this phase in the disease process in the three patients studied were in a range of 10-17mg of quinine dihydrochloride per liter. Based on peritoneal dialysate assays, it appears also that peritoneal membrane clearances of quinine are variable, but overall are less than might be anticipated. With the onset of diuresis, full dosage schedules may be resumed to complete an appropriate course of therapy.

b. In Vitro (in test tube) data: Preliminary results of four experiments carried out as designated under "experimental design" indicate that quinine dihydrochloride is diffusible across the cellophane membrane of the Kolff twin-coil kidney. At therapeutic blood levels, such as 15mgm/L, quinine may be detected after approximately 1 to 2 hours of dialysis. It will then accumulate in a linear fashion, and significant concentrations are measurable. The effect of non-ionic diffusion of quinine could not be determined on the basis of these studies.

OBSERVATION: Analysis of the available data indicates that further research is highly desirable.

34. ITEM: Treatment of gonorrhea. (681044)

DISCUSSION: The one-dose treatment for acute gonorrhea (2.4 million units aqueous penicillin) has proved inadequate in a significant percentage of cases since the emergence of strains of gonococcus less sensitive to penicillin has been observed worldwide. Three methods of treatment are being examined to determine which will provide the most effective cure rate and the shortest loss of time from duty.

a. 2.4M units aqueous penicillin intra-muscular plus probenecid 1.0 gm orally at the time of injection, then 0.5 gm at six and twelve hours effected cure in 93.2% of the cases.

b. 4.8M units aqueous procaine penicillin intra-muscular plus probenecid, as above (used only if the first treatment failed) cured 72.4% of the cases in which it was tried.

c. Tetracycline 500 mgm every six hours for seven days (used if a failure of the second treatment occurred or if a history of penicillin hypersensitivity was elicited) cured 80% of the cases.

OBSERVATION: The first treatment has considerable merit since it minimizes time lost from duty and assures completion of the recommended treatment within 24 hours.

35. ITEM: Shock lung syndrome. (674064)

DISCUSSION: The 3d Surgical Hospital reported that a few seriously wounded patients will develop a syndrome of respiratory insufficiency as late as 5 to 7 days after injury. These patients do not necessarily have chest injuries. They tend to go into pulmonary edema of a non-cardiac nature, become poorly oxygenated and eventually go into terminal heart failure with cardiac outputs 3 or more times than normal. Patients who have this alveoli and poor diffusion of oxygen into the pulmonary capillaries do not have difficulty in eliminating carbon dioxide. These patients have a number of characteristics in common:

a. Shock with a blood pressure less than 70 on admission.

b. pO_2 on admission of 40 to 60 which continues to remain persistently low.

c. Require large amounts of blood in excess of 15 to 20 units during resuscitation and subsequent surgery.

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d. Maintain a persistently low blood volume and central venous pressure despite seemingly inordinate amounts of blood and fluids.

OBSERVATION: Experience indicates that patients with the above characteristics will develop this syndrome. Once the syndrome has developed, the only treatment that has proved helpful is the continuous use of a volume respirator with high percentages of oxygen in the ventilating gas.

This syndrome may be prevented by:

a. Recognition that the patient falls into the category that may develop it.

b. The earlier use of the high pressure volume respirator to restore the pO_2 and lower the cardiac output.

c. Vigorous efforts to restore the blood volume and red blood count mass to normal. These patients require an inordinate amount of fluid, but as long as the renal output continues to be good, the seemingly excessive amounts of blood and volume expander do not overload the circulation or give congestive failure. Serial blood cell and plasma volumes are helpful in estimating when the end point has been reached.

36. ITEM: Therapy for patients with open soft tissue injuries.
(674036)

DISCUSSION: The man-hours lost due to open soft tissue injuries is greatly increased if the commencement of a physical therapy program is delayed until after wound closure and formation of scar tissue. Problems commonly caused by such a delay are: reduction in range of motion, loss of muscle strength and a possible deformity involving the affected limb(s). These problems can be minimized and often eliminated if a progressive physical therapy program is begun early. Whenever possible, a patient with an open soft tissue injury should be started on a rehabilitation program before closure of the wound and before the formation of scar tissue has developed to an extent which limits the reconditioning effort. The program may be divided into two phases: prior to closure and after closure. Prior to closure, the physical therapy program consists primarily of instructing the patient in: maintaining his range of motion; regaining the range of motion he has lost; and commencement of, light, strengthening exercises to maintain muscle tone; the use of crutches for early ambulation; and maintenance of his overall physical condition. After wound closure, the program should increase in intensity with the patient's tolerance being the key factor.

OBSERVATION: During the latter part of CY 1967 the 93d Evacuation Hospital gained considerable experience in the treatment of body extremities with open soft tissue injuries. This experience showed

that patients started on physical therapy before wound closure rehabilitated with greater speed and better results than those who could not be started prior to closure of their wounds. Thus, the patients who were started on an early program required a shorter period of hospitalization.

37. ITEM: Pre-operative care of battle casualties. (674036)

DISCUSSION: The 93d Evacuation Hospital experienced a mass casualty situation during the October 1967 reporting period wherein the emesis of fluid by a patient during anesthetic induction alerted the anesthesiologist to the possibility of recent fluid ingestion by the other 34 patients. Consequently, a stomach aspiration performed on all of the other patients awaiting surgery revealed that all had recently ingested fluids.

OBSERVATION: The administration of oral fluids to battle casualties is dangerous for these patients tend to aspirate their stomach contents during induction of general anesthesia resulting in an aspiration pneumonitis. There is also a danger of vomiting and aspiration during air evacuation.

38. ITEM: Reducing undesirable side effects of the chloroquine-primaquine tablet. (681088)

DISCUSSION: The 36th Signal Battalion reported that the efficiency of some personnel was reduced by the weekly chloroquine-primaquine tablet. USARV, in turn, observed that the chloroquine-primaquine tablet affected a significant number of personnel with side effects, such as diarrhea, abdominal cramps, headache, malaise and insomnia.

OBSERVATION: Individuals who are adversely affected by the chloroquine-primaquine tablet should be instructed to break the tablet in half before intake. Such action will alleviate the undesirable side effects in many personnel. This is probably due to the two pieces diffusing the absorption through a greater portion of the alimentary canal. In personnel to whom this does not offer sufficient relief, the intake of one-half of the tablet at each of two consecutive meals will further minimize the side effects. These methods of administration should not be adopted as routine for all personnel.

SECTION II

PREVENTIVE MEDICINE

1. ITEM: Prevention of malaria. (T674246) (674164)

DISCUSSION: The 1st Infantry Division reports that the prevention of malaria is a command function which begins with the battalion commander and goes down through the chain of command to the individual squad leader. A successful unit program can significantly contribute to the prevention of malaria and the subsequent loss of manpower.

a. A unit should have a responsible individual witness the consumption of the anti-malaria pill.

b. Individuals should be provided sufficient insect repellent, and resupply should be effected when requested. Leaders at all levels of command must insure that each individual has sufficient insect repellent prior to departing on an operation. The soldier, while in the field, should be checked daily to insure that he has a bottle of insect repellent.

c. Personnel operating in areas where a high incidence of malaria is found should have their sleeves rolled down during the hours of dusk, darkness and dawn. The prevention of mosquito bites is the first step to prevent malaria.

OBSERVATION: The prevention of malaria is a function of all levels of command. Vivax malaria is totally preventable by the weekly use of anti-malaria pills. While the anti-malaria pill consumed by US personnel is less effective against falciparum malaria, it offers some protection, and the incidence of falciparum malaria can be reduced by the drug as well as by preventing mosquito bites. Commanders should examine their current procedures for distribution and consumption of anti-malaria pills and other anti-malaria actions.

2. ITEM: Prevention of Amoebic dysentery. ^R(670093)

DISCUSSION: Filtration is required to remove sediment, color and turbidity. Shallow wells increase the possibility of ground water contamination with disease-causing organisms from surface sources. Amoebic dysentery, a disease prevalent in Vietnam, is transmitted by contaminated water.

OBSERVATION: The only effective means of removing the disease-causing cysts of Entamoeba histolytica from water is by diatomite filtration. Chlorination should be accomplished prior to filtration so that iron salts precipitated by the addition of chlorine will be removed. The disinfection by chlorination must be sufficient to provide a minimum free available chlorine (FAC) residual of 5 ppm after a 30-minute period.

3. ITEM: Salt depletion syndrome. (T674255)

DISCUSSION: The 9th Infantry Division reported that many unit commanders have expressed, and the doctors have noted, that booby trap and anti-personnel mine casualties are occurring between the hours of 1300 to 1800. This time frame spans the hottest time of the day, and most of the troops who have been physically active in the morning seem to wear down physically and mentally during the afternoon hours. These symptoms are associated with "salt depletion" and sodium loss, in particular, and result from excessive perspiration in tropical climates coupled with insufficient salt intake and a relative fluid excess.

OBSERVATION: A review of 90 days of salt consumption in a unit plagued by booby trap incidents during afternoon hours revealed an average salt tablet consumption of 0.7 tablet per man per day. It is probable that an increase in the salt consumption to a minimum of 4-6 tablets per man per day will result in more efficient tactical operations and a concomitant decrease in injuries and accidents because the sensorium of the troops will not be dulled by hyponatremia (sodium deficiency in the body).

4. ITEM: Tuberculosis in indigenous personnel. (650003)

DISCUSSION: An X-ray study revealed that between 13 to 15% of Nung guards examined had active tuberculosis. Patients found to have active tuberculosis were treated on an outpatient basis with triple therapy. The response was highly gratifying.

OBSERVATION: Indigenous personnel employed by US units should be given thorough medical examinations to detect and treat communicable diseases.

5. ITEM: Superficial cuts and wounds. (660291) (660509)

DISCUSSION: Personnel frequently neglect superficial cuts and wounds, especially those associated with bamboo. Such injuries often cause boils and skin infections requiring prolonged treatment.

OBSERVATION: Personnel should be made aware of the seriousness of neglecting any type wound or injury. They must also be trained in the immediate first aid measures that should be taken when personnel receive a superficial cut or wound.

6. ITEM: Prevention of heat casualties. (660511)

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DISCUSSION: A tactical unit reported that many heat casualties were caused by an individual's reluctance to use indigenous water sources and sufficient salt tablets during a long march.

OBSERVATION: All leaders must ensure that their troops are properly trained in the use of water purification, and salt, tablets.

7. ITEM: Prevention of skin rashes. (670624) (674164)

DISCUSSION: Many personnel consider body rashes as insignificant and complain only when the rash is chronic. Omnipresent fungal organisms in the humid climate of Vietnam contribute greatly to the cause.

OBSERVATION: Measures which have proved effective in controlling body rashes are:

- a. When possible, potable water should be used in the shower systems.
- b. Powder should be used in underwear and socks.
- c. All laundry should be thoroughly washed with sufficient soap, rinsed and dried, preferably sun-dried. Personnel who have a persistent rash are advised to use detergent and bleach mixture to wash underclothes.
- d. Supervisory measures should be instituted wherever the laundries on the local economy are used.

Although rashes may be controlled to an extent, they generally require medical attention for effective cure.

8. ITEM: Prevention of ear infections. (670624)

DISCUSSION: Ear infections, particularly among aviators, are common in Vietnam. Such infections are often caused by non-potable shower water or perspiration that has accumulated inside aviator's earphones draining into the ear canal.

OBSERVATION: Personnel should attempt to keep non-potable water out of their ears and should clean their ears frequently with Q-tips and alcohol. Nylon net covers can be placed over an aviator's earphones but must be cleaned periodically. Personnel should report for medical treatment whenever pain, itching or discharge from ears is experienced.

9. ITEM: Prevention of intra-abdominal abscesses. (681044)

DISCUSSION: Intra-abdominal abscesses frequently follow severe colon wounds. Post-operative collection of blood and fecal contamination are ideal cohabitants to produce this complication. Thoraco-abdominal injuries with involvement of the colon and the liver or spleen have a 10- to 15% incidence of sub-phrenic abscesses. Pelvic wounds having rectal perforation, and fractures of the pelvis, are also prone to develop an abscess. Antibiotics alone will not prevent infected hematomas from becoming frank abscesses.

OBSERVATION: Measures that can be taken to decrease the frequency of intra-abdominal abscesses are:

- a. Intra-abdominal hemostasis.
- b. Adequate debridement.
- c. Lavage of contaminated areas.
- d. Proper positioning of the drains.
- d. Adequate exit wound for drains.
- f. Antibiotics.
- g. Advancing drains as drainage ceases.

10. ITEM: Prevention of vivax malaria. (681044)

DISCUSSION: The proportion of vivax malaria in USARV remains between 30 to 35%. This type malaria is completely suppressed by weekly chloroquine/primaquine prophylaxis. These facts indicate that improvement in malaria discipline is necessary. A study of medical records conducted during December 1967 concluded that infantry personnel in grade E-3 or below were most vulnerable to malaria since they are more exposed than other personnel. The chloroquine/primaquine tablet does cause abdominal cramping and diarrhea in some individuals, and this is often cited as the reason for not taking the drug. However, when it does occur, diarrhea is usually mild and transient and is not considered sufficient cause for missing malaria prophylaxis.

OBSERVATION: Command emphasis on taking the tablet is the way to reduce the proportion of vivax malaria. Personal protective measures, such as use of insect repellent and head nets, will also reduce the incidence of malaria.

11. ITEM: Prevention of malaria in USARV returnees. (670600)

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DISCUSSION: Many cases of malaria occur among servicemen in the United States shortly after their return from Vietnam. Many of these cases are caused by failure of individuals to continue malaria pills as prescribed. The chloroquine-primaquine tablet, taken weekly by all personnel in Vietnam, should be continued, one tablet each week, for eight weeks after departure. Individuals who took the additional Dapsone (DDS) tablets while in Vietnam must continue daily treatment for four weeks after departure. Commanders are responsible for providing necessary amounts of malaria tablets to personnel departing their units.

OBSERVATION: Personnel must be instructed on the importance of continuing the malaria chemoprophylaxis for the required period after their departure from RVN. Personnel should be provided malaria tablets in plastic or glass vials which are labeled with the name of the drug, instructions for its use and the warning: DANGER--MAY CAUSE DEATH IN CHILDREN.

SECTION III

MEDICAL EVACUATION

1. ITEM: Use of Field Medical Regulators. (681060)

DISCUSSION: When a unit is engaged in an area where casualties are evacuated to two or more supporting hospital facilities, Field Medical Regulators should be requested to insure the proper distribution of patients and for the handling of special category patients. Air Force evacuation teams are available to provide evacuation in most instances where Field Medical Regulators are used. The combination of the Field Medical Regulator - Air Force Teams has proven effective in high casualty situations when Air Force aircraft were immediately available for evacuation.

OBSERVATION: Medical Regulators are often available for attachment on request to a medical company from Field Army Medical Supporting Activities (medical groups). (See Item 7, Section VIII.)

2. ITEM: Medical evacuation by helicopter for riverine forces. (T674255)

DISCUSSION: Experiences of the 9th Infantry Division indicate that medical evacuation by helicopter should normally be accomplished to permit triage within the division. For example, casualties are evacuated from the tactical area to the medical facility near a fire support base for triage (sorting) and emergency medical care. Further evacuation to Army level hospitals, if required, is accomplished with another helicopter which is used to evacuate from the forward medical facilities on call.



CASUALTIES BEING
EVACUATED FROM A
TACTICAL AREA

OBSERVATION: Casualties in the lightly wounded category are more quickly returned to duty because triage and treatment within the divisional area may preclude further evacuation. Thus, there is a decrease in administrative procedures and travel otherwise required to return a lightly wounded casualty to duty from an Army level facility. This technique permits a more efficient use of division level medical facilities and decreases the risk of casualty fatality by reducing the flying time necessary to obtain professional treatment. (See Item 3, this section.)

3. ITEM: Reduction of the evacuation effort. (650106)(674280)

DISCUSSION: The 4th Infantry Division reported that casualties with minor wounds and injuries are often treated at the medical battalion's base camp clearing station. If it appears that complete recovery will require no more than 5 days, such casualties are held at the clearing station's infirmary. The medical battalion's base camp clearing facilities are considered more than adequate for treatment and retention of such casualties.

OBSERVATION: The retention and treatment of casualties with minor wounds or injuries at the division's medical battalion clearing station reduces the burden on higher medical facilities. Such action also reduces the delay in returning personnel to duty since the transportation and administrative time required in handling personnel during evacuation and return to station is greatly reduced.

4. ITEM: Employment of battalion surgeons. (660122)

DISCUSSION: Battalion surgeons, when employed forward, are often unable to treat casualties occurring in the forward area. The majority of casualties are evacuated from the combat zone by air ambulance directly to a medical clearing company, by-passing the battalion aid station.

OBSERVATION: Employment of battalion surgeons should remain flexible. If lines of communication are short, surgeons may deploy forward with their unit; if lengthy, battalion surgeons may augment the medical clearing company. Air ambulances usually operate from the medical clearing company; therefore, battalion surgeons may accompany ambulances to the pick-up site to administer resuscitative treatment on site and during the return flight to the clearing company.

5. ITEM: Surgical capability at forward clearing company. (660122)

DISCUSSION: Frequently, zones of operations are quite distant from medical facilities which have a surgical capability. Life-saving minutes are often lost due to the time/distance factor for evacuation.

OBSERVATION: Where the time/distance factor for evacuation is excessive, augmentation of the forward medical clearing company with a surgical capability is extremely beneficial in providing resuscitative surgery.

6. ITEM: Importance of the clearing station in the evacuation chain. (681098)

DISCUSSION: The necessity for utilizing clearing stations rather than relying on direct evacuation over extended distances to a hospital was demonstrated during the heavy fighting in the Dak To area. Even if aircraft had been available, some of the casualties would have died in transit to the hospital without the relatively immediate, professional care administered at the clearing station. None of the 929 WIA who were admitted to the clearing stations operated by the 173d Airborne Brigade and the 4th Infantry Division at Dak To during November died either in the clearing stations or enroute to the hospital. "Immediate availability" factors which proved to be of the utmost importance to this success are:

- a. Each of the clearing stations had a medical officer with approximately three years of residency in a surgical specialty.
- b. Approximately 175 units of whole blood were given by the two clearing stations during the month.
- c. X-rays of several patients with chest wounds resulted in the use of chest tubes. This is significant because the clinical picture did not adequately indicate the extent of the hemo- or pneumothorax. Some of these patients would have probably developed respiratory difficulty during evacuation had chest tubes not been used.

OBSERVATION: Air evacuation has not made the clearing station obsolete. Clearing stations with well-trained personnel and adequate equipment provide a life-saving link in the evacuation chain.

7. ITEM: Evacuation policy for pneumothorax/hemothorax cases. (670600)

DISCUSSION: At a recent surgical conference, a statistically significant number of patients from all RVN Corps areas were presented who had sustained chest injuries. These casualties had been evacuated to off-shore hospitals shortly after chest drainage tubes had been removed. An incidence of 20+ percent of pneumothorax and hemopneumothorax was encountered upon arrival of these casualties at Clark Air Force Hospital, Philippine Islands. Follow-up on Army patients with similar treatment arriving in Japan showed a substantially lower incidence of complications which in no instance had been critical. Until recently, USARV hospitals had been advised that no patient would be evacuated to off-shore hospitals sooner than

24 hours following chest tube removal and before a chest X-ray just prior to evacuation to assure that complete lung expansion had occurred.

OBSERVATION: Experience indicates that the time interval between chest tube removal and evacuation to off-shore hospitals should be no less than 72 hours with chest X-rays prior to evacuation.

8. ITEM: Evacuation policy for arterial injury cases. (670600)

DISCUSSION: A follow-up on Vietnam casualties revealed that, in a series of 67 limb amputations performed at Clark AF Hospital on casualties due to arterial failure following injury to that vessel, 73 percent originated in Vietnam I Corps area; 27 percent represented Army, ROK and other services. It is well known that certain factors force the early evacuation of Marine casualties to off-shore hospitals, whereas US Army patients can be retained in Vietnam much longer and be evacuated at a more stable period following surgery. By inference, disruptive changes in major arterial repairs are caused by premature evacuation. Heretofore, USARV hospitals have retained major arterial repairs for 9 to 10 days post-surgery.

OBSERVATION: On the basis of the comparison presented, such cases are now retained within USARV hospitals for 15 to 21 days to further enhance stabilization of the arterial repair and limb salvage.

SECTION IV

MEDICAL SUPPLY

1. ITEM: Priority of construction. (670074)

DISCUSSION: The 44th Medical Brigade reported that the basic nucleus of A&D, Pre-Op, Surgery, Post-Op, X-Ray and Laboratory are essential for the initial emergency operation of a hospital. If a semi-permanent or permanent hospital is constructed in a theater of operations, supply facilities should be constructed along with the initial nucleus.

OBSERVATION: Multiple handling of supplies and equipment is time-consuming and inefficient. Thorough planning and early construction of supply facilities to include the laundry will permit the hospital supply system to become operational with the nucleus.

2. ITEM: Property accountability in medical units. (660197)

DISCUSSION: The 68th Medical Group reported that newly activated medical units normally do not exercise adequate control and accountability for medical equipment and supplies. The primary shortcomings that have been identified are:

a. Units are overly concerned about accountability of minor non-expendable assemblies which contain only expendable items.

b. Several non-expendable items in major assemblies are carried as a single line entry in the property book.

c. No definite written policy, such as an SOP, is established for accountability of expendable medical supplies.

OBSERVATION: Units should maintain control of all non-expendable items in the major assembly and should record expendable medical supplies on stock record cards to establish demand data and requisition objectives based on a 10-day stockage objective and a 5-day safety level.

3. ITEM: Supply economy. (660197)

DISCUSSION: The 68th Medical Group, based on a year's experience, reported that hospitals frequently generate excesses due to:

a. Limited usage of assembly components which have become obsolete or are not required in the theater.

b. Overestimate of usage when establishing the initial stockage for new items.

c. Tendency to overstock and hoard because of delays in shipment from depot.

d. Failure to establish procedures to accumulate demand data.

OBSERVATION: All hospitals must establish and follow sound accounting procedures. This will decrease cost of inventories on hand and assure a more responsive supply system. Specific ways to reduce and prevent having an excess of medical equipment and supplies are:

a. Maintain informal stock records in accordance with chapter 13, AR 711-16.

b. Limit stockage to 10-day operating level and 5-day safety level plus actual order-shipping time.

c. Accumulate demand data and prepare and circulate a list of excess items for screening by other units. After other units have received items they can use, excesses are turned in to depot.

d. Check newly arriving units as soon as they become operational to insure that proper supply procedures have been established.

4. ITEM: Security of equipment during trans-shipment. (660406)

DISCUSSION: Deploying units normally adequately safeguard their equipment during shipment through the use of escorts and guards. However, when the equipment is turned over for trans-shipment within Vietnam, pilferage is experienced.

OBSERVATION: Units should insure security measures at ports and trans-shipment yards are adequate to protect their equipment from pilferage even if they must provide escorts or guards.

5. ITEM: Medical supply and maintenance support for dispensaries. (660402)

DISCUSSION: Medical dispensaries assigned to a medical group, although often widely dispersed, are in most cases located near evacuation or field hospitals. In one instance, it was found that several such dispensaries each obtained medical supplies from the same medical depot. This procedure resulted in some personnel traveling great distances to obtain supplies and increased the work load on the depot supply system. Since these units did not have trained supply personnel, administrative procedures were lax, stockage was excessive and maintenance of medical equipment was below standard.

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OBSERVATION: The 68th Medical Group found that the satelliting of medical dispensaries on field and evacuation hospitals for expendable medical supply and equipment maintenance support reduced traffic exposure, time-consuming trips to the medical depot and increased efficiency in supply maintenance and dispensary operations.

6. ITEM: Blanket cancellation of unfilled requisitions. (660406)

DISCUSSION: Blanket cancellations of unfilled requisitions by direct support units at times causes unnecessary work and delays. Liaison visits to depots have often revealed that items for which requisitions were cancelled are in stock.

OBSERVATION: Every effort should be made by the depot to fill requisitions. At times, the supported unit may find a liaison visit to the supporting depot of value.

7. ITEM: Supply administration. (660402)

DISCUSSION: The 68th Medical Group reported that many medical cellular teams and dispensaries are not authorized supply and administrative personnel; however, they must maintain property records in accordance with AR 735-35. Inspections of these units disclosed several deficiencies and irregularities in supply administration and control of property.

OBSERVATION: The 68th Medical Group initiated the following actions to offset the lack of knowledgeable supply personnel in these units:

a. Supply officers of hospitals or battalions are appointed Responsible Officer for the property books of any assigned or attached teams not having supply or administrative personnel.

b. TOE property is placed on hand receipt to the detachment commander to enable detachment commanders to retain control of equipment and insure correct supply procedures.

8. ITEM: Centralization of property books. (660390)

DISCUSSION: The S-4, 74th Medical Battalion assumed the responsibility for maintaining property books and supply records of assigned dispensaries with the exception of the 346th Medical Dispensary which was exempted due to its remote location.

OBSERVATION: Experience gained to date with this centralization of responsibility shows that many routine problems previously caused by inexperienced, untrained personnel performing supply duties within dispensaries have been eliminated.

9. ITEM: Requesting medical supplies. (660396)

DISCUSSION: The primary means of requesting medical supplies is by telephone. Although this appears to be the most expeditious way to notify the supporting agency at times significant time losses are experienced due to equipment malfunction and overloading of circuits.

OBSERVATION: The establishment of a Medical Brigade Command teletype net with the major treatment facilities would provide a means of rapidly producing printed requests to the support agency. The same net could also be used to provide a channel of communication for medical regulating offices.

10. ITEM: Medical supply for dispensaries. (660390)

DISCUSSION: Dispensaries normally obtained their medical supplies from a medical supply point. Frequently, although located near a hospital, dispensaries were required to send personnel extended distances to obtain medical supplies.

OBSERVATION: Dispensaries located closer to hospitals than to platoons of the Medical Depot should procure needed supplies from these hospitals. This method of operation will reduce man hours lost to travel time and simplify depot operations by reducing the number of accounts handled.

11. ITEM: Disposition of perishable medical items during deployment. (670080)

DISCUSSION: The 71st Evacuation Hospital reported that its perishable items were transported by air from Fort Campbell, Kentucky, to Madigan General Hospital. The perishables were then transported by bus to the port dock at Tacoma, Washington. Then the perishables were stored under refrigeration aboard the USNS Darby. These perishables were turned in upon arrival in Vietnam.

OBSERVATION: Deploying units should be advised as to the disposition of perishable medical items on hand prior to deployment from CONUS.

12. ITEM: Stockage of expendable medical supplies and equipment. (660391)

DISCUSSION: The 3d Field Hospital reported experiencing a general shortage of medical expendable supplies during a three-month period ending 31 October 1966. Some due outs from the medical depot in excess of 180 days presented a problem especially when a large number of patients were admitted or transferred to the hospital.

An analysis (October 1966) of the status report reviewed by the 1st Advance Platoon, 32d Medical Depot shows that of approximately 335 medical items on order 60 days or longer, 273--or 81%--were valid due outs.

It has been found that a 15-day requisition objective is not sufficient to operate this hospital and meet the demands for emergencies. A 10-day operating level, 5-day safety level and 0-day order and shipping time does not provide for adequate stockage of expendable supplies.

OBSERVATION: The 3d Field Hospital recommended that a minimum of a 75-day requisition objective be maintained in order to meet emergency requirements and significant increases in missions.

13. ITEM: Marking of H type oxygen cylinders. (670093)

DISCUSSION: During the month of January 1967 the 36th Evacuation Hospital experienced a case of transitory arterial hypoxia during anesthesia when an H type oxygen cylinder was suspected (not proved) of containing compressed air.

OBSERVATION: It is recommended that all oxygen cylinders be dated when filled and initialled by the filling authority. (See Item 16, this section.)

14. ITEM: Liaison with supporting elements. (660396)

DISCUSSION: The 93d Evacuation Hospital established liaison with all supporting supply elements. This liaison insured the desired exchange of information and contributed to informing elements of current and projected activities.

OBSERVATION: It appears that the establishment of a supply coordination/control center would simplify supply procedures for newly arrived units and reduce the amount of time required to locate various depots and issue points. The importance of proper coordination with all elements contributing to mission accomplishment must be continuously emphasized.

15. ITEM: Medical resupply. (670084)

DISCUSSION: The 18th Surgical Hospital was located approximately five hours by road from a medical depot advance platoon. Due to the length of this trip by vehicle, all casualty evacuation was carried out by air. Since there were no returning ambulances in which to haul

supplies and delivery was not provided by the depot, the hospital was required to pick up and transport all medical supplies. Such supply runs were made in 2½-ton vehicles over a five-hour road run in convoy through insecure territory. These runs frequently resulted in the three-day absence of two corpsmen (secondary duty: drivers) from the primary patient care responsibilities for a single supply run to depot. Ordinarily, an average of two such trips weekly was required.



RESUPPLY BY HELICOPTER CAN
NEGATE MANY PROBLEMS.

OBSERVATION: Medical units not located near their supporting depot should discuss the difficulty of obtaining medical supplies with other units located in their general vicinity. Such action may result in obtaining assistance. An ideal solution would be to coordinate the pick-up and delivery of medical supplies with aviation elements. Such action would reduce the time lapse and eliminate the road travel through insecure areas.

16. ITEM: Use of locally filled compressed air tanks. (670093)

DISCUSSION: Prior to December 1966 all inhalational therapy performed at the 36th Evacuation Hospital was through the Bennett respirator powered by medical oxygen from the standard 1650-gallon, 2200 PSI tanks. Each tank weighed 148 pounds and was valued at \$42. Shipment of these tanks from Saigon was either by air or barge. Normal monthly usage, calculated over a six-month period, was 22 tanks. (It is noted that in standard anesthesia machines, flows of oxygen are 1½ to 2 liters/min while the Bennett machine expends gas at the high rate of 15 to 20 liters/min, with a 6-hour life to each tank.) The handling and storage of medical oxygen, therefore, posed a problem of some magnitude. On a number of occasions, medical oxygen was in short supply, necessitating curtailment of inhalational therapy to maintain emergency supply of oxygen for the anesthesia service.

This problem was solved by obtaining the use of an air compressor from post engineers which delivered 1900 PSI of clean, compressed air to a standard 1650-gallon tank. This permitted the unlimited use of the Bennett respirator for extended periods of time when oxygen is not required. Four 1650-gallon tanks, painted black in accordance with standard color coding, are refilled as needed, markedly reducing storage and handling problems.

As of January 1967 nine compressed air tanks had been used representing a savings of 1322 pounds shipping from Saigon and a total overall round trip weight of nearly double that amount.

OBSERVATION: The use of compressed air locally obtained, rather than medical oxygen, for inhalation therapy, unless contraindicated by the patient's medical condition, may be used. This will result in a saving of money and valuable cargo space on aircraft. (See Item 13, this section.)

17. ITEM: Stryker frames used for patient evacuation. (660529)

DISCUSSION: Although patients are evacuated on a Stryker frame, the item is not replaced by property exchange by the Air Force. They will give a receipt for the frame which serves as the basis for requisitioning another frame. There has been a problem keeping sufficient Stryker frames in the medical depot and at the hospital.

OBSERVATION: Stryker frames are not an item of direct exchange; thus, stockage levels should be established to insure that sufficient frames will be available in the hospital.

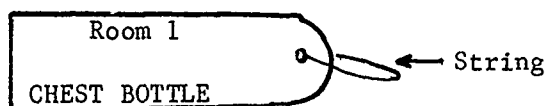
18. ITEM: Consolidation of medical supply operations. (681060)

DISCUSSION: Brigade mobility is an axiom of Army operations in Vietnam; therefore, a large medical supply and stockage operation within the supporting medical company detracts from the divisional brigade's mobility and is unnecessary due to normal support from the division base.

OBSERVATION: Large quantities of medical supplies increase transportation and storage requirements and reduce the capability of the divisional brigade to rapidly displace with supporting elements.

19. ITEM: Restocking operating rooms with sterile equipment. (674065)

DISCUSSION: The 45th Surgical Hospital reported reducing the time required to restock operating rooms by developing a marking system using tongue blades. This system was accomplished by cutting tongue blades in half and punching a small hole in the round end. A double piece of string about 4 inches long was then doubled through the hole and attached under the autoclave tape on each package or tray. The tongue blades were labeled with a Magic Marker as follows:



All items and trays in the operating room and Central Materiel Supply were then tagged. When a case is set-up in the operating room, all tongue blade markers from the items used are returned to the work area for re-use. New items are then sterilized and rewrapped with the appropriate tongue marker on top and placed in the sterile supply room. The absence of loose tongue blades indicates that all material stocked in a particular operating room has been readied for sterilization, or has been sterilized. Since Central Materiel Supply keeps sterile supply at the level desired for the operating rooms, the supplies can often be replaced in the operating room prior to the completion of the case.

OBSERVATION: This system has reduced the time required to restock operating rooms and is especially useful during mass casualty situations.

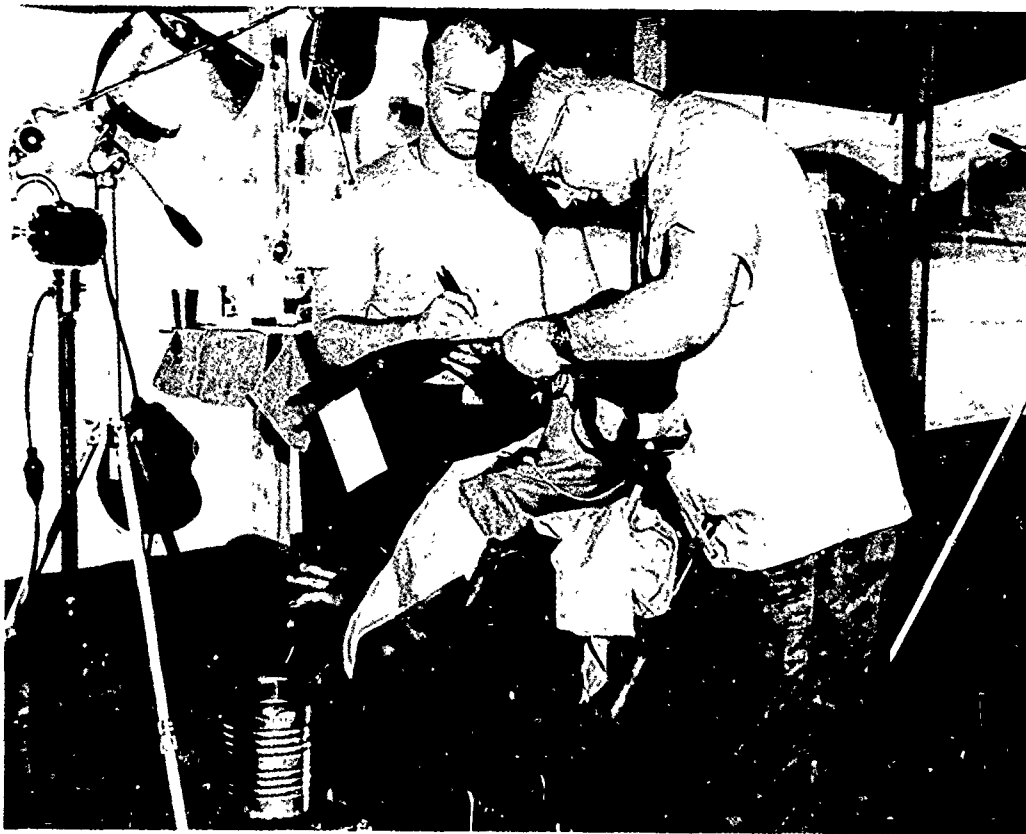
SECTION V

DENTISTRY

1. ITEM: Dental appointments. (660407)

DISCUSSION: Dental appointments made two or more weeks in advance are ineffective because a soldier in the field does not know where he will be even a few days in advance. The soldier's tactical mission is given priority over dental appointments; however, timely dental care must be provided the troops.

OBSERVATION: Four clinics of the 137th Dental Service Detachment experimented with a modified appointment system by having specific officers book appointments for personnel requiring definitive care. The remainder of the dentists treated patients on a first-come, first-serve basis. In most instances, the field soldier was seen immediately.



THE ARMY DENTIST MUST BE PREPARED FOR OPERATIONS UNDER A WIDE
RANGE OF ENVIRONMENTAL CONDITIONS

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2. ITEM: Dental records. (660188)

DISCUSSION: Graves registration personnel are experiencing difficulty in identifying deceased personnel due, in part, to inadequate dental records. A survey of 1,103 records at the 90th Replacement Battalion indicated that about 7% of incoming personnel had no dental records and that many of the dental records available were inadequate for identification purposes.

OBSERVATION: Dental records must be complete and accurate in order to assist Graves Registration personnel to identify the dead.

3. ITEM: Maintenance of the Encore High Speed Dental Machine. (660188)

DISCUSSION: Evidence of maintenance problems began to occur with the Encore High Speed Dental Unit in June 1966. Analysis of the problem areas encountered with this machine indicated that a lack of user maintenance, coupled with the heat, humidity and dust of Vietnam, was the cause of most equipment failure.

OBSERVATION: Enlisted personnel must be trained to properly perform the necessary maintenance. Supervisory personnel must know the requirements to quickly detect improper maintenance. Consideration should be given to the preparation and distribution of SOPs regarding maintenance procedures to insure a uniform standard.

4. ITEM: Providing information. (660407)

DISCUSSION: In order to offer timely and pertinent subjects, problems and solutions, the dental division of the Army Medical Field Service School must have a reliable source of information about the Vietnam situation.

OBSERVATION: Elements in the field can contribute to the development and evaluation of doctrine and training material by forwarding such items as documents, photographs, newsletters, correspondence and general information obtained from daily operations to those agencies of the Army having an interest. The information reported in Operational Reports - Lessons Learned has played an important role in updating doctrine and training material.

5. ITEM: Vietnam's climatic effects on dentistry. (660188)

DISCUSSION: The high heat and humidity of Vietnam have made dental waxes difficult to work, caused rapid deterioration of drugs, ruined deliquescent materials (such as disclosing wafers) and hindered X-ray processing.

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OBSERVATION: Refrigerators can be used to solve many of these problems. They can be used to provide ice to cool X-ray solutions, keep waxes and biologicals cold and provide dehumidified compartments. Since all items are not suitable for storage in refrigerators, guidance must be available for the preparation of hot boxes and chemical anti-mildew compounds. Air conditioners are an excellent solution if suitable buildings and power are available.

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SECTION VI

PSYCHIATRY

1. ITEM: Psychiatric factors influencing combat exhaustion. (681044)

DISCUSSION: It has been considered in other wars that the number of combat exhaustion cases was a function of the number of injuries resulting from hostile action (IRHA) cases since these injuries reflected the intensity of stress. However, an analysis of the experience gained in Vietnam during November 1967 through January 1968 does not appear to support this theory. For example:

a. Riverine operations conducted during November 1967 through January 1968 were characterized by excursions into the enemy's lair for 24 to 48 hours with almost certain contact and frequent fierce fire fights. The men could always count on returning to air-conditioned quarters in a ship with good food, movies and other facilities. In three months there were no cases of combat exhaustion.

b. Highland jungle operations in the Dak To area during November were characterized by great uncertainty as to length of isolation from other friendly forces and of duration of the enemy fire which sometimes kept men essentially sleepless for days. The result was 990 IRHA and 23 combat exhaustion cases.

c. A typical month's operations in many tactical units consisted of forays lasting three to seven days with great uncertainty as to whether contact would be made, intense fire fights, but seldom isolation or failure to return to some sort of base at the predicted time. Combat exhaustion under these conditions amounted to about 1% of IRHA.

OBSERVATION: Experience gained during November 1967 through January 1968 supports the conclusion that combat exhaustion rate may depend on the predictable rhythm of stress and relief from stress, rather than an intensity of stress.

2. ITEM: Utilization and experience of psychiatrists. (681044)

DISCUSSION: Misunderstandings concerning patient problems between treatment centers and the forward division psychiatrists have led to the present USARV policy of insuring that every incoming psychiatrist has some experience in a divisional forward area.

OBSERVATION: Psychiatrists in different echelons did not realize that a patient's behavior depends in part on his social surroundings and that when he is evacuated out of a division area he often exhibits a com-

pletely different set of attitudes and behaviors; so much so that his psychiatric evaluation may sound like that of a different person. When psychiatrists added division experience to their rear echelon training, they were able to properly synthesize the different aspects of the problem.

3. ITEM: A Mental Hygiene Team concept. (670600)

DISCUSSION: The number of psychiatrists and social workers authorized in-country is approximately correct, but the present authorized spaces are not correctly arranged to provide appropriate and efficient coverage in relationship to the modern concepts of military preventive psychiatry. At present, mental health officer personnel are authorized as follows:

a. The present authorization of one psychiatrist and one social worker for each combat division is considered satisfactory. There are two KO teams authorized in-country. Each has three psychiatrists and two social work officers capable of operating a center providing psychiatric and neurologic consultation, evaluation, treatment and disposition.

b. Each evacuation hospital, the 6th Convalescent Center and the 8th and 17th Field Hospitals are authorized a psychiatrist; the 6th Convalescent Center only is authorized a social worker, and he is well utilized.

c. A number of evacuation hospitals are located where there is adequate psychiatric coverage from other sources; some, where there is little US military population. There are also large support troop concentrations, such as Cam Ranh Bay, where no evacuation hospital exists.

OBSERVATION: The concept of a small Mental Hygiene Team is proposed to afford area coverage to large concentrations of support troops--an implementation which would provide psychiatric coverage on a more realistic footing. Such a concept is already realized in each combat division which has a psychiatrist, a social worker and up to six enlisted mental hygiene specialists. A team of this approximate composition, equipped with a $\frac{1}{2}$ -ton truck, could provide appropriate psychiatric consultation, evaluation, treatment and disposition for a base population of 15,000 to 20,000 troops. For larger bases, two such teams could be combined. Such teams could be attached to the medical unit providing local coverage. This concept would provide not only better utilization of psychiatrists but would also provide the additional social work officers needed in a modern program of military preventive psychiatry.

SECTION VII

MEDICAL CIVIC ACTION PROGRAMS (MEDCAP)

1. ITEM: Integration of US and Vietnamese medical programs. (681098)

DISCUSSION: Emphasis should be placed on the integration of US Medical Civic Action Programs (MEDCAP) with Vietnamese health efforts. The manner in which restraint, proper channeling and coordination of MEDCAP efforts can contribute to the long-term improvement of the Vietnamese health system was demonstrated during an outbreak of plague in November 1967. The efforts of US elements to move to the area and establish control and treatment measures were coordinated with the Vietnamese efforts. This resulted in the situation becoming an excellent training vehicle for the Vietnamese health workers. Whenever feasible, US units should ensure that their MEDCAP activities are coordinated through, and used to supplement, the existing Vietnamese health system.

OBSERVATION: US medical assistance programs should be geared to train and augment Vietnamese health personnel whenever possible. Such action contributes significantly to upgrading Vietnamese health programs.

2. ITEM: Medical Civic Action Program (MEDCAP). (670467)

DISCUSSION: The 199th Infantry Brigade reported that in the past, a roving MEDCAP was used. Although medical teams visited all hamlets, a patient treated for serious burns or illness was frequently not seen again, or, at best, not seen for several weeks. During April 1967 this procedure was changed by having each rifle battalion establish three permanent treatment sites. In addition, brigade headquarters and the artillery battalions each established and maintained a treatment site in daily operations. The battalion treatment sites are operated two days a week with the schedule announced by loud-speaker. Since the new system went into effect, the number of patients has risen sharply from 9,474 persons in March to 14,825 in April. MEDCAP personnel are able to treat the patients in a more professional manner since they can vary treatment as needed.

OBSERVATION: Patients travel as far as 10 kilometers to receive MEDCAP assistance with the assurance that it will be available. Although more supplies have been required due to the increase in persons treated, the individual disbursement of medication has lessened because the sick who are able to return to the dispensary do not require a large amount of medication to hold them through the estimated life of the sickness. MEDCAP teams operating at permanent sites are better able to establish a rapport with the villagers.

3. ITEM: MEDCAP conducted by battalion. (670772)

DISCUSSION: The 196th Infantry Brigade reported that MEDCAP activities conducted during a tactical operation, such as cordon and search, blunt the civilian hostility towards the tactical operation. When a MEDCAP is conducted with the cordon and search operation, a structure is located which has limited access, is close to a large, shaded area and central to the hamlets. This structure is searched with mine detectors, as is the landing zone. At this point, a four-man team consisting of the Battalion Surgeon, a Clinical Technician and two aidmen from the battalion aid station is transported to the area. Additional medical personnel are drawn from the medics indigenous to the unit conducting the tactical activity. In addition, one or two members of the S-5 team of the battalion accompanies the medical group to supply literature, candy, soap, clothes and other things. Practical considerations contributing to the success of the MEDCAP are:

a. Crowd control. The entrance to the building utilized for treatment is restricted. The people should not be forced to seek medical care to obtain the gifts since this increases the load of patients without measurably benefiting the community.

b. Drug control. Drugs, soap and other supplies should be re-packaged or the original package marked to prevent sale of these items through black market channels. Quantity limits are determined by the illness plus the consideration that any large, identifiable amounts make the receiving patient a target for Viet Cong terror to obtain the medication. This benefits neither the patient nor the purpose of MEDCAP.

c. Follow-up treatment. Company medics located permanently near the village are utilized for follow-up treatment. The people are not forced to travel to the battalion base camp and the medic's judgment is heightened by prior knowledge and the judgment of the physician accompanying the original treatment team.

d. Supplies should include necessary medical equipment and sufficient water for treatment and consumption.

e. Interpreter. An interpreter is necessary and should be transported with the medical team. For control purposes, an additional interpreter may be provided by the company conducting the operation.

OBSERVATION: Conducting MEDCAP operations concurrently with other operations permits a more efficient use of personnel and a greater unity of efforts. The unification of other operations with MEDCAP also provides each participant with a better understanding of their mutual problems and purposes.

4. ITEM: Medical Civic Action Program activities. (T674246)

DISCUSSION: The 1st Infantry Division reported the following lessons learned from experience gained during extensive MEDCAP operations:

a. MEDCAP can be increased in scope by maneuver battalions conducting MEDCAP in their operational areas when the tactical situation permits. Such activities will permit the rapid detection of areas requiring a major medical effort.

b. Whenever possible, MEDCAP and psychological operations should be integrated.

c. A minimum of monthly follow-up visits to the same area are necessary to provide continuity of treatment and thus, increase the villagers' confidence.

d. MEDCAP should be planned and coordinated with the province, district and village chiefs and their US advisors.

e. A trained agent can accompany medical teams to ascertain Viet Cong activities and any other information desired.

f. Interpreters are a must for an effective MEDCAP: for a large operation (200 to 800 patients) two interpreters are needed--one at admissions, one with the doctor.

g. A dentist should always be present during MEDCAP operations.

h. Directions in Vietnamese for taking medicine must be issued with prescriptions. The death of one child was reported as the result of an overdose administered by a parent who did not understand the directions.

i. MEDCAP conducted in conjunction with cordon and search operations are very successful in controlling Vietnamese removed from the search area. Frequently, doctors are requested to visit patients unable to come to the treatment site. These requests should be honored whenever possible; however, the doctor should be provided adequate security.

j. The name and home location of any patient in serious condition who refuses evacuation should be obtained so that the local health personnel or the advisory team medic can follow the case.

k. When possible, MEDCAP activities should be co-located with Vietnamese dispensaries. The Vietnamese personnel profit by the experience of working with highly trained US medical personnel.

l. The establishment of road blocks or check points between the MEDCAP site and the area being serviced tends to discourage patients.

m. The integration of ARVN and US MEDCAP teams during large operations will permit an exchange of ideas and project an excellent image of cooperation to the populace.

n. Personnel connected with MEDCAP operations should learn at least the basic Vietnamese greetings. A courteous greeting to the villagers encountered contributes significantly to development of the desired rapport.

OBSERVATION: A survey of Vietnamese civilians provided medical treatment indicated that the MEDCAP efforts were greatly appreciated. To some extent, this attitude reduced the effect of the Viet Cong anti-US propaganda. The training of local personnel in dispensary operations and as nurses contributes to the development of the Vietnamese capabilities to run their own programs.



US ARMY DOCTOR EXAMINING A VIETNAMESE CHILD DURING MEDCAP ACTIVITIES CONDUCTED IN COORDINATION WITH TACTICAL OPERATIONS.

SECTION VIII

MISCELLANEOUS

1. ITEM: Recording nature of wound. (660514)

DISCUSSION: The 3d Brigade, 25th Infantry Division reported that casualty reports reflecting inaccurate information in the "nature of wounds" entry have caused considerable confusion when letters of sympathy or award recommendations have been written. Commanders having personal knowledge of the death of their personnel will not change their account of the injury to conform with an inaccurate casualty report.



PROPER NOTATION BY AID-
MEN AS TO WOUND TYPE
WILL ASSIST THE DOCTOR
AND HELP PREVENT INACCU-
RATE CASUALTY REPORTS.

OBSERVATION: A small fragment wound may appear to be a gunshot wound; therefore, aidmen must ensure that Item 14 (Diagnosis) of DD Form 1380, US Field Medical Card, attached to each evacuee clearly indicates the appropriate injury, i.e., "GS" (Gunshot) or "FRAG" (Fragmentation). This indication assists both the doctor and the brigade casualty reporting team, which obtains its information from doctors located in the brigade clearing station. All doctors and casualty reporting personnel must take the time to read each casualty tag before making an irrevocable entry on the official casualty report.

2. ITEM: Unnecessary losses to retrieve casualties. (670772)

DISCUSSION: Personnel, including medical aidmen, should be instructed not to unnecessarily endanger their lives to rescue or retrieve a wounded soldier under hostile enemy fire. Such risks often result in

the unit suffering casualties which could have been prevented. Also, the death of the wounded soldier may be avoided since he probably will not be taken under fire again if he remains calm. Additionally, leaders will often divert their attention to rescue operations when all efforts should continue to be concentrated to defeat the enemy. The unit must first clear the area before diverting its attention to the wounded.

OBSERVATION: One casualty often leads to more when efforts are made to retrieve a fallen soldier who is still exposed to hostile fire. Leadership critically important to accomplish the destruction of the enemy is interrupted or lost completely as the leader becomes involved in rescuing his wounded.

3. ITEM: Control of rabies at US installations. (670074) (T674275)

DISCUSSION: Reliable rabies data in South Vietnam are not available; however, recent reports tend to indicate this disease may be more widespread than at first believed. Many more animal heads have been diagnosed as positive for rabies during the 2d quarter of FY 67 than the previous period.

OBSERVATION: Pets on US installations should be immunized and kept under control. In addition, a system must be implemented to dispose of all stray animals.

4. ITEM: Importance of identification of civilian evacuees. (674570)

DISCUSSION: Tactical units frequently evacuate civilian casualties to US medical facilities without any information as to name or residence. If such an evacuee dies, it is extremely difficult to ensure the remains receive the proper disposition.

OBSERVATION: All civilian casualties should be tagged prior to evacuation to show their name, location from which evacuated, and the unit which ordered evacuation. The receiving medical personnel should enter this information on the patient's records to facilitate the return of the individual or his remains to his family.

5. ITEM: Safeguarding a patient's valuables. (660391)

DISCUSSION: The 3d Field Hospital has developed a standard operating procedure to ensure that a patient's valuables are adequately safeguarded. When a patient is admitted, his valuables are listed by the admissions clerk on a Patients' Deposit Record (DA 8-178). The patient's valuables and his deposit record are then taken to the Registrar's Office where appropriate entries are made on a log sheet. In the event a patient makes a partial withdrawal prior to release, the appropriate entry is

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made on his log sheet by the Registrar, thus ensuring a continuous, correct accounting. A sample format for such a log sheet follows:

NAME & REGISTRATION NUMBER	RECEIVED BY (Initials & date)	WITHDRAWN BY	PURPOSE OF WITHDRAWAL	VALUABLES TRANS- FERRED TO
Doe, John W. 9475	WSS 26 Oct 66	FB 7 Dec 66	Discharged for Duty	Patient

OBSERVATION: This method provides a standard operating procedure for safeguarding a patient's valuables from the time of his admission to his disposition.

6. ITEM: Design of medical facilities. (650010)

DISCUSSION: When designing a medical facility, consideration must be given to the possibility of processing mass casualties. In such situations, buildings with large open areas are preferred and should be as free of interior partitioning as possible. This is particularly true in receiving areas, X-ray, pre-op wards, surgery and post-op wards. Other wards must be capable for conversion to either pre-op or post-op use. The receiving area should have double doors for entry and exit to permit a one-way flow of patient traffic from receiving to X-ray to pre-op to surgery. The surgical area should be divided into stalls rather than rooms for ease in handling large numbers of litter-borne patients.

OBSERVATION: Proper design and layout of hospital areas will facilitate the processing of mass casualties.

7. ITEM: Employment of a forward medical regulating officer. (68X004)

DISCUSSION: The 67th Medical Group established a forward control group in support of the 25th Infantry Division during Operation YELLOWSTONE. The control group consisted of a medical regulating officer (MRO), a commissioned assistant, a noncommissioned officer and a radio operator. During Operation YELLOWSTONE, the division's three brigades were committed simultaneously in widely dispersed operations. The MRO regulated aeromedical evacuations from the various clearing stations to Army level facilities and selected field pick-up sites between base camps. The MRO also performed the necessary liaison between the 67th Medical Group and the 25th Infantry Division.

OBSERVATION: The technique of a medical group employing a control group with a division's forward elements has proved very satisfactory during combat operations. It provided a rapid, direct coordination with the division, conservation of air ambulance resources and the desired patient management. (See Item 1, Section III.)

8. ITEM: Adequacy of resuscitation trays in patient care area.
(674065)

DISCUSSION: Experience of the 45th Surgical Hospital showed that contents of resuscitation trays were not adequate. A detailed study of the problem resulted in the following items being placed in a well-marked, closed tote tray:

EQUIPMENT	QUANTITY	DRUGS	QUANTITY
Suction Catheter #18	1	Epinephrine 1:1000	4 amps
Oropharyngeal Airway	1	Neosynephrine 1%	1 vial
Syringes 30 ml	4	Aramine 1/6 ge/co	1 vial
Syringes 10 ml	4	Isuprel 1:5000	1 amp
Intracardiac Needles 4"	1	Solu-cortef 100mgm	2 vials
Intracardiac Needles 5"	1	Calcium chloride	2 amps
Syringes 2 ml	4	Atropine 1/150	1 vial
Needles #16	8	Dilantin (+dilutent)	1 vial
Needles #18	8	Xylocaine 2%	1 vial
Angiocath #14	1	Sodium chloride	
Angiocath #16	1	injection	2 amps
Blood recipient set with three way stop cock	1		
Tourniquet	1		
Alcohol sponge jar	1		
Ringers lactate (1000CC)	1		
Adhesive tape strips (on bottle)	4		
Blood pressure cuff	1		
Stethoscope	1		

OBSERVATION: An evaluation of the above stockage over a 30-day period indicates that it is more than adequate for immediate resuscitation.

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