Chapter 4

PSYCHIATRIC ASPECTS OF DISEASES IN MILITARY PERSONNEL

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INTRODUCTION

The intent of this chapter is to describe some of the ways that the behavior of soldiers and their leaders can modulate the occurrence of manpower loss due to disease. The actions (and inactions) of soldiers that remove troops from fighting status may be a form of "voluntary casualty" whose prevention is a command issue. For example, preventing the ineffectiveness that arises from malaria is more likely to be successful in the short run if viewed as a behavioral problem (how to ensure that the soldiers take the prophylactic pill) than as a medical problem (how to develop a longer lasting prophylaxis).

The U.S. Army has long recognized that it is engaged in a continuous battle to resist the attacks of what Heggers calls "natural biological warfare."[1] Because past wars have seen more soldiers removed from combat because of disease than from battle injuries, improvements in the health of soldiers can potentially restore more troops to combat status than eliminating all battle casualties. A remarkable description of the impact of infectious diseases and the stress of continuous jungle combat on the fighting strength of Merrill's Marauders, a World War II fighting unit in the China-Burma-India theater, is found in the compilation of the original reports by Stone[2] and the reprint of the 1945 Historical Division report.[3]

> McGee's forces were attacked. The Japanese were not present in great strength, but the 2d Battalion was so wasted by fatigue, dysentery, malaria, and malnutrition that the unit was not effective for combat. During the engagement, several men went to sleep from exhaustion. Colonel McGee himself lost consciousness three times and between relapses directed the Battalion from an aid station."[3(p113)]

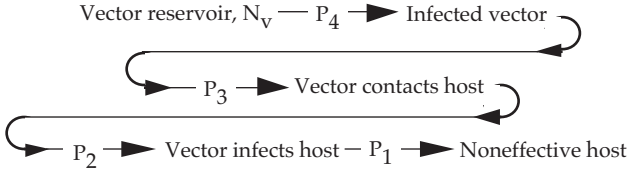
The debilitating effects of the medical problems far exceeded the losses from hostile fire and led to the dissolution of the unit.

The focus of this chapter is on the statistics of major infectious diseases armywide and theaterwide and is intended to alert the reader to some major causes of noneffectiveness in prior wars. Although the behavioral, biological, and social components of every disease can be influenced by command policies, this chapter focuses on four diseases that were significant in World War II and the ways that they were manifest in the Korean and Vietnam conflicts. The emphasis of the disease descriptions is on their social and psychological aspects.

A GENERAL FRAMEWORK OF DISEASE COMMUNICATION

The loss of manpower because of combat stress can be thought of as a specific instance of the general process of disease-related loss of manpower. The author adopts a broad view of disease to include those behavioral and psychological processes that remove soldiers from combat for varying periods.

The framework for considering disease-related manpower-loss is an epidemiological agent–vector–host disease model (where the agent is the "germ" or pathological entity, the vector is the intermediate vehicle of transmission, and the host is the soldier). The author considers the end product (a noneffective soldier due to disease) to depend on a sequence of events (where each event in the sequence can be analyzed separately). Such a framework expands the options for informing command policies in ways that can be applied to reduce the loss of manpower. The functional relations defining the model are that a pathogen causes a disease if there are enough vectors and if the probability of sequential transmission is high enough. This transmission is composed of four significant events: (1) the host becomes diseased after exposure to the pathogen (an event that occurs with probability, P_1), (2) the pathogen is introduced by contact with the infected vector (with probability, P_2), (3) the vector makes contact with the host (with probability, P_3), and (4) the vector has acquired the pathogen from the reservoir (with probability, P_4). As a sequential chain terminating with a noneffective soldier (seen in the following diagram), the probabili-



ties are combined by multiplication corresponding to the observation that reducing any one necessary step serves to limit the overall value of the chain to that value or less.

In statistical terms, the probability chain is multiplicative and conditional on the number of vectors (N_v). Disease results when the product of that number of vectors and the probabilities of the events of the chain exceed some critical threshold. In addition, P_1, the probability of becoming diseased, given exposure, can be subdivided into categories (defined by the length of time that the disease state renders the soldier noneffective) to reflect disease severity. For completeness, P_1 can also be expanded to reflect the individual's prior history of exposure.

The various strategies that have been used by the military medical services in previous wars to reduce the impact of disease may all be interpreted in terms of their contribution to modifying this chain of probabilities, the number of vectors, or the average duration of noneffectiveness.

In the following discussion will be found armywide data on the rates of occurrence of four selected disorders that were frequent or exceptional problems in World War II, some discussion of both the precipitants and consequences of those diseases, and consideration of some of the public health issues (screening, ambulatory care, vectors, and hygiene) related to the control of these disorders. Those diseases are also considered during the Korean and Vietnam conflicts. The data are drawn from the published medical records. The reader with a continuing interest in this area is referred to the American Public Health Association's *Control of Communicable Diseases in Man*[4] for a brief description of the history of the various communicable diseases and information on how to recognize a specific disease, to recognize the modes of disease transmission, and to manage the patient so that the disease does not spread.

MAJOR WORLD WAR II DISEASES: THE BIG FOUR

During World War II, Reister[5] reports that there were about 3 million admissions for infectious and parasitic diseases among U.S. Army personnel. These admissions amounted to an annual rate of 117 per 1,000 strength and, as a major diagnostic category, were second only to diseases of the respiratory system (an annual rate of 177 per 1,000), which were handled separately. The grand total for diseases was 15 million admissions, with an additional 2 million nonbattle injuries. The category of infectious and parasitic diseases accounted for 18% of the 339 million soldier-days lost due to hospitalization (noneffectiveness) for a disease or nonbattle injury. Because of the differences in the average number of days per admission, the more frequent respiratory diseases hospitalizations accounted for only 12% of the lost days. Among the medical conditions that were of concern during that time, there are four that will be discussed below: tuberculosis (TB), venereal diseases (VDs), malaria, and hepatitis. The annual rates for these conditions during World War II and the Korean and Vietnam conflicts are presented in Table 4–1. Comparisons with World War I data are made in the text. These four diseases were selected because they occurred frequently in the military or civilian communities and thus represented sig-

TABLE 4–1

ANNUAL ADMISSION RATES PER 1,000* OF SELECTED DISEASES BY YEAR AND AREA

	Tuberculosis	Venereal Disease	Malaria	Hepatitis
World War II worldwide				
1942	1.7	40.4	6.8	15.2
1943	1.2	41.4	22.3	4.2
1944	0.8	44.6	19.0	3.6
1945	1.2	65.6	10.8	10.1
Korea				
1950	0.9	44.7	11.0	19.0
1951	1.0	150.5	10.0	16.8
1952	0.8	192.9	12.5	5.8
Vietnam				
1965	0.2	277.4	48.5	5.7
1966	0.1	281.5	39.0	4.0
1967	0.1	240.5	30.7	7.0
1968	0.1	195.8	24.7	8.6
1969	0.1	189.7	20.8	6.4
1970	0.1	223.0	23.4	7.6
1971	0.0	326.4	16.5	9.6
1972	0.2	698.9	5.0	10.0

* Includes carded for record only.

nificant medical noneffectiveness, or had the potential to do so.

Tuberculosis

TB was the leading cause of civilian disease death in the military age group during the World War II years as reported by Long.[6] Because the annual case rate in the military was only slightly more than 1 per 1,000, TB was not a major cause of noneffectiveness during the war despite the fact that an average case extended for 113 days. The TB rate was reduced to one-ninth of the value of World War I by the policy of rejecting entry into the army of both active and arrested cases of TB. The screening program was a considerable success for the army and had the overall public health benefit of detecting and identifying cases of TB in the civilian population.

The agent–vector–host chain for TB begins with the observation that the agent, the tuberculosis bacterium, is commonly found in the environment. The vector may be bacteria-containing droplets exhaled by other diseased individuals or other respiratory carriers (P_4 is large). When in an area where TB is endemic, every sneeze must be assumed to be contaminated and to provide exposure (P_3 is high). Based on the observations that a large fraction of soldiers are positive reactors to the test for prior exposure to TB (P_2 is high) but that there are a small number of TB cases, current soldiers appear to be relatively resistant to TB (P_1 is small). The TB screening of soldiers before enlistment keeps out those with preexisting disease. The aggressive handling of those with compromised immune systems (for whom P_1 is large so that they are more likely to contract TB) has minimized that source of cases.

Venereal Diseases

The VDs amounted to over one-third of all infectious and parasitic disease cases during World War II.[5] The noneffectiveness rate is calculated using only the inpatient cases, and the rate was relatively low because the largest proportion of cases did not interfere with duty and were treated on an outpatient basis where they appear as carded for record only (CRO). The rate for VD in World War II was only about one-half of the rate observed during World War I (49 per 1,000 versus 87 per 1,000)[5] although Table 4–1 shows increasing values in successive wars. The cluster of VD differs from the other three disease categories because VD is not a single disease and there are few if any outpatient cases for the other diseases. The introduction of penicillin in 1944 did not result in a significant reduction in the recorded VD rate during World War II or subsequent wars.

For these diseases, prevention efforts have historically been concerned with condom use (which reduces P_2), reduced frequency of sexual intercourse (which reduces P_3), and health inspection of prostitutes (which reduces P_4).

Malaria

With a rate of 16 per 1,000 for the entire war, malaria was not a worldwide problem. Within various theaters, however, the malaria rates were not benign and, at the extreme, reached an annualized equivalent rate of 4,000 per 1,000 at Milne Bay in late 1942[7] and 210 per 1,000 in 1943 in the southwest Pacific.[5] There were parallel differences in the noneffectiveness rate, which reached its peak of 14 excused from duty per day per 1,000, in the same theater in 1943. There was a large, but unquantified, performance loss in soldiers who were symptomatic but still deployed and not hospitalized.

The agent–vector–host chain for malaria is well defined with the agent being a parasitic protozoan, *Plasmodium* sp., and the vector being a mosquito, *Anopheles* sp. The probabilities are interpretable as P_4 being the probability that the average anopheles has previously bitten a malaria-infected human, P_3 is the probability of being bitten, P_2 is the probability that the bite transfers the parasite, and P_1 is the probability that the transferred parasite causes the disease. Field malaria discipline consists of administering prophylactic drugs (to keep P_1 low), using physical barriers and repellents (to keep P_3 low), avoiding malaria-endemic areas (to keep P_4 low), and employing mosquito eradication programs (to reduce N_v).

Although malaria was included in the "Big Four" because of the disease's well-defined natural transmission by the mosquito vector, it has an interesting psychiatric sidelight. The prevention and treatment of malaria with quinacrine hydrochloride (Atabrine) during World War II in the India-Burma theater was associated with a number of cases of psychosis. A review of the evidence by Mays[8] concluded that a toxic psychosis occurred in 0.12% of the malaria cases treated with Atabrine, and that Atabrine was indeed responsible for the psychosis. The limitation of the geographic distribution to the India-Burma theater suggested to Glass[9] that the effect is not entirely pharmacologic in nature: "Experiences of

other theaters in World War II indicate that Atabrine alone without situational stress and primitive conditions of tropical living does not produce psychotic reactions."[9(p1021)]

Hepatitis

Hepatitis occurred at an annual rate of 8 per 1,000 troops armywide. The highest regional rate occurred in the southwest Pacific with a rate of 26 per 1,000.[5] Before World War II, hepatitis was not considered to be a military disease although many cases of jaundice (many of which were due to hepatitis) occurred during the Civil War. During the process of immunizing soldiers against yellow fever, a contaminated vaccine caused an epidemic of close to 50,000 cases in 1942 as described by Havens[10], and those cases probably represented one-quarter of all of the hepatitis cases that occurred during all of World War II.

The recent availability of hepatitis vaccines has shifted the preventive focus to host resistance (P_1) from the attempts to lower environmental contamination (P_3). The requirements for good sanitation are not relaxed, however, because hepatitis is not the only disease capable of fecal-oral transmission and vaccines are not available for every such disease.

In addition to hygienic issues illustrated by Paul and Gardner[11] in the correlation of hepatitis with the diarrheal and dysentery diseases of poor sanitation, the natural history of hepatitis is a directly psychiatric issue. The disease presentation may include malaise, fatigue, nausea, or other symptoms that can be initially perceived as psychosomatic. A delayed recovery syndrome, referred to as the posthepatitis syndrome and characterized by fatigue and gastro-intestinal disorders after the objective signs disappear, was reported[10] in a small percentage of patients. Havens[10] infers that the syndrome was caused by the interaction of the hepatitis with a preexisting neurosis (neurotic predisposition) because the syndrome responded to adequate diet, physical reconditioning, and indoctrination.

This kind of interaction between individual psychological needs and the sequelae or symptoms of a disease was outlined by Glass[12] in his description of two ways through which soldiers manifest their inability to deal with the combat environment. The first is through overt combat fatigue, which legitimizes withdrawal from combat. The second is one of the following three psychosomatic states that legitimizes delayed return to combat: (1) persistent symptoms with negative somatic findings, (2) persistent symptoms with minor objective findings, or (3) delayed convalescence. Glass[12] makes a strong case for viewing the health behavior of soldiers as multidetermined by physiologic, psychologic, and sociologic forces.

OTHER INFECTIOUS AND PARASITIC DISEASES IN WORLD WAR II

The four diseases mentioned above amounted to 64% of the admissions for infectious and parasitic diseases during World War II. The remaining admissions were divided into viral diseases (21%), with influenza (6%) as the most frequent single disease; bacterial diseases (6%); arthropod infestation (4%); protozoan and helminth infections (3%); rickettsial and fungal diseases (1%); and an unclassified remainder (3%).[5]

THE BIG FOUR IN KOREA

The Korean conflict data arrayed by Reister[13] show that, overall, cases of infective and parasitic diseases were admitted at an annual rate of 48 per 1,000 strength, which was 40% of the value for World War II. The VD CRO cases were tabulated separately and occurred at an annual rate of 57 per 1,000 strength in divisions and regimental combat teams (combat troops), which was a higher annual rate than that recorded for all types of cases (CRO and admissions) during World War II. The VD rate (including CRO) for all troops in Korea was 146 per 1,000. Disposition rates for hepatitis, malaria, or TB are not available for the Korean conflict although the provisional admission data give annual rates of 16 per 1,000 for hepatitis, 11 per 1,000 for malaria, and 1 per 1,000 for TB. The definitive clinical trials of the effect of diet and exercise on the course of hepatitis in over 400 soldiers were done at this time by Chalmers et al.[14] The report of the trials makes no mention of a posthepatitis syndrome, which was

present in World War II reports, although a careful reading of the description of their population suggests that the number of their psychotic cases was more than would be expected by chance.

THE BIG FOUR IN VIETNAM

The Vietnam conflict medical data are available as provisional admission data from Neel[15] for 1965 through 1970 and disposition data for selected conditions from Ognibene and Barrett[16] for 1965 through 1972. The overall infectious and parasitic disease rate is not yet available. The average annual VD rate from January 1964 through June 1972 was 325 per 1,000. The rate was not constant and ranged from a low of 190 per 1,000 in 1969 to a high of 699 per 1,000 in the first 6 months of 1972. The average annual rate during 1965 through 1970 for malaria admissions was 31 per 1,000, with a decreasing trend from 48 per 1,000 in 1965, to 22 per 1,000 in 1970.[15] As with World War II, during the Vietnam conflict, small area rates were sometimes very high, and Neel[15] reports that there were at least two maneuver battalions that were rendered ineffective by malaria. Hepatitis was reported at an average annual rate of 6 per 1,000. TB was almost nonexistent, with a reported rate of 0.09 per 1,000 in the 1965 through 1970 period, despite a high endemic rate in the area and intimate contact with the local population as seen in the VD rate.[15]

PUBLIC HEALTH ASPECTS OF THE BIG FOUR

Tuberculosis and Screening

TB is a chronic debilitating disease whose symptoms of depression and fatigue may mimic mental disorders. Screening has been effective in keeping the TB rate low within the military. TB is a disease that had for a time after World War II all but disappeared in both the civilian and military sectors. It has been included here to illustrate screening rather than as a current military medical problem. The appropriate extension of the concept of screening of individuals to prevent their entry into the army for clinical entities other than TB depends on multiple factors. A detection method of adequate sensitivity (cases are identified as cases) and specificity (noncases are identified as noncases) is needed. Screening is not economical for a relatively rare condition when the screening method has inadequate sensitivity because the cost of the screening program may exceed the cost of allowing the cases to appear and be treated within the army. Nor should screening be done with inadequate specificity unless there are an excess of civilians available for service. Because low-specificity screening will incorrectly identify some large fraction of the normals as cases, the rejection of those cases may make it impossible to reach recruiting goals.

Throughout this discussion of screening, the tacit assumptions have been that the underlying condition is truly chronic without remission, that expression of its signs and symptoms interferes with the performance of a soldier's duties, that there is a significant load on the medical system associated with each case, and that there are no overriding external (political) considerations preventing the use of a screening program or following the screening with actions based on the results of the program. TB is a condition that fits the assumptions listed above.

During World War II, screening was an administrative rather than a medical responsibility. It was initially used to reject registrants with any form of VD or with mental disorders or psychoneurotic traits, as well as to reject TB cases. The deferment due to VD was terminated in early 1943 in response to public pressure and therapeutic advances. A psychiatric history was not initially used as a rejection criterion, but that liberal policy was modified in response to complaints from army combat officers to be more restrictive so that even suggestive evidence of emotional instability was cause for rejection. The acute need for soldiers in 1944 led to a reversal of this blanket deferment policy and the introduction of a brief written test to select those who required further psychiatric evaluation before induction into the military.

Venereal Diseases and Ambulatory Treatment

For an acute condition such as VD that can be effectively treated in an outpatient setting, there is

a low reported noneffectiveness despite a large number of cases. Realistically, however, that large number of cases represents a considerable number of lost soldier-years, albeit a few hours at a time. The viral VDs and the recently detected types of VD that are resistant to conventional drug treatment suggest that future cases may require more vigorous and repeated outpatient or even inpatient treatment.

The knowledge gained from World War II regarding medical noneffectiveness associated with inpatient hospitalization continues to be applicable today. As summarized by Glass,[17] an almost universal experience of medical officers in World War II concerned the deleterious effect of hospitalization. In a significant number of military personnel, hospitalization seemed to fixate symptoms, retard expected clinical improvement, and negatively influence motivations for return to duty. "During these early years, it became apparent to many wartime psychiatrists and other medical officers that hospitalization in itself created or perpetuated illness and disability."[17(p748)]

In addition to illustrating the desirability and necessity of ambulatory care, VD also serves to illustrate the social aspects of disease processes. VD is sometimes viewed as a behavior problem or a voluntary disease because the prerequisite sexual behavior without proper prophylaxis is unequivocally an individual action within a specific social environment. Attention has been focused by Jones[18] on the observation of Reister that the Korean conflict VD rates were inversely related to combat intensity and directly related to the proportion of combat support troops.

The high VD rate in the Vietnam conflict reflects a variety of social and psychological forces that reduced the efficacy of conventional preventive procedures. Starting with World War II, the U.S. Army policy described by Sternberg[19] has been to provide and encourage wholesome recreation to occupy soldiers' free time as a way to reduce VD rates. The author observes from Neel's[15] data on American troops in Vietnam that the VD rate, including carded-for-record-only cases, varied as the inverse of the troop strength. The rates were lowest when the troop strength was highest and highest when the strength was lowest. The author speculates that the high VD rate after 1969 in Vietnam may reflect changes in the combat intensity and troop composition similar to those that led to the high VD rate during the Korean conflict after mid-1951.[13]

Malaria and Vector Transmission

Malaria is a disease that is transmitted by the bite of a specific type of mosquito if that mosquito had previously bitten an infected human. Direct person-to-person transmission through blood transfusions or illicit drug-use needles has not been reported to be a major nonvector transmission mode.[13] In theory, the disease can be prevented by disrupting the chain of transmission with environmental manipulation to reduce the number of mosquitos and antimalarial drug treatment and prophylaxis to reduce the number of infected humans. In practice, malaria remains a problem when troops are relocated because antimalarial discipline may not be implemented in a timely manner. Prophylaxis is not completely effective and has undesired side effects so that avoiding the vector is frequently a more effective strategy than depending on compliance with an unpleasant prophylactic regimen. The case of malaria that develops after the soldier has failed to take the scheduled malaria prophylaxis is a form of voluntary illness. As with dehydration from failure to maintain scheduled water intake, frostbite from failure to change socks, VD from failure to use a condom, or hepatitis from failure to avoid unsanitary local food, these voluntary illnesses represent manpower loss, which potentially can be avoided by appropriate leadership influences.

Hepatitis and Hygiene

Hepatitis is a communicable viral disease that may present with irritability or even psychosis, incapacitates the patient for weeks, renders him debilitated for months, and may have permanent consequences. The practical modes of transmission are the oral ingestion of fecal-contaminated substances and the injection of hepatitis-contaminated substances or use of hepatitis-contaminated needles. The introduction of the single-use disposable needle and the air-gun immunization system have reduced the patient risk of iatrogenic hepatitis. The health care providers who are exposed to blood or blood products are at elevated risk for hepatitis.[20] The reuse of needles for illicit drug intake remains a transmission route for hepatitis, both type A and type B. The breakdown of primary sanitation is the major cause of the spread of hepatitis in wartime. The primary hygienic goals for the control of hepatitis are to keep human excreta out of the food chain and to provide adequate amounts of uncontaminated or purified water.

ADDITIONAL COMMENTS ON HIV AND AIDS

The human immunodeficiency virus (HIV) is a transmissible agent with a long incubation period and is responsible for the fatal acquired immuno-deficiency syndrome (AIDS). Three army areas immediately impacted by the recent emergence of AIDS are the logistical (blood supply), the psychological (cohesion), and the tactical (deployment). These areas are briefly discussed below.

Current U.S. Army expectation includes the concept that each soldier can be available to serve as a "walking blood bank"[21] to provide emergency blood transfusions for a wounded comrade. Continuous introduction of HIV into army personnel will probably occur both from heterosexual VD and through illegal homosexual acts or intravenous drug abuse. Screening for infection is hampered by the long and variable time between infection with HIV and the ability of current tests to detect the presence of the virus. The presence of a positive HIV test makes that soldier's blood untransfusable; the possibility that the soldier may be infectious through exposure too recent to produce a positive test makes many soldiers' blood untransfusable. A reexamination of blood supply doctrine seems indicated in light of the emergence of HIV.

The small-group performance of the army is maintained by cohesive interpersonal relationships. The HIV-infected soldier is a challenge to the group cohesion. The revelation that HIV infection has occurred raises the question that it may have happened through behaviors (homosexuality or illicit drug use) that are not consonant with those of the other members of the group.

The occurrence of HIV infection among the sexually active, overseas population forces reexamination of the consequences of deployment. HIV infection is endemic in central Africa and has been reported among prostitutes worldwide.[22] The VD transmission to soldiers on overseas deployments is proportional to the probability of occurrence of the other VDs.

SUMMARY

The mission of the U.S. Army Medical Department is the conservation of the fighting strength. Because infectious and parasitic diseases have accounted for large amounts of lost time, even fractional reductions in the number of cases or the average length of stay per case can have a significant impact by returning many soldiers to duty. This chapter has presented some of the trends of the significant diseases (TB, VD, malaria, and hepatitis) of soldiers; some of the traditional responses to those diseases (screening, ambulatory care, vector control, and hygiene); some of the sociological, psychological, and psychiatric aspects of those diseases that can be influenced by command policy; and a framework for thinking about the communication of disease. The intention here has been to remind health professionals of the magnitude of wartime illness and to focus their attention on some of the behavioral factors associated with these diseases.

REFERENCES

1. Heggers JP. Microbial invasion—The major ally of war (natural biological warfare). *Milit Med*. 1978;143(6):390–394.

2. Stone JH. *Crisis Fleeting*. Washington, DC: Office of The Surgeon General, US Department of the Army; 1969.

3. Center of Military History. *Merrill's Marauders February–May 1944*. Washington, DC: US Department of the Army; 1990.

4. Benenson AS. ed. *Control of Communicable Diseases in Man*. 15th ed. Washington, DC: American Public Health Association; 1990.

5. Reister FA. *Medical Statistics in World War II*. Washington, DC: Office of The Surgeon General, US Department of the Army; 1975.

6. Long ER. Tuberculosis. In: *Infectious Diseases*. Vol 2. In: Havens WP, Jr., ed. *Internal Medicine in World War II*. Washington, DC: Office of The Surgeon General, US Department of the Army; 1963: 329–407.

7. Russell PF. Introduction. In: *Communicable Diseases, Malaria*. Vol 6. In: Coates JB, Jr., Hoff EC, Hoff PM, eds. *Medical Department, U.S. Army Preventive Medicine in World War II*. Washington, DC: Office of The Surgeon General, US Department of the Army; 1963: 1–10.

8. Mays JRS. Consultant's composite report of toxic psychoses due to atabrine, India-Burma theater. In: *Overseas Theaters*. Vol 2. In: Glass AJ, ed. *Neuropsychiatry in World War II*. Washington, DC: Office of The Surgeon General, US Department of the Army; 1973: 1087–1094.

9. Glass AJ. Lessons learned. In: *Overseas Theaters*. Vol 2. In: Glass AJ, ed. *Neuropsychiatry in World War II.* Washington, DC: Office of The Surgeon General, US Department of the Army; 1973: 989–1027.

10. Havens WP, Jr. Viral hepatitis. In: *Infectious Diseases and General Medicine*. Vol 3. In: Havens WP, Jr., ed. *Internal Medicine in World War II*. Washington, DC: Office of The Surgeon General, US Department of the Army; 1968: 331–384.

11. Paul JR, Gardner HT. Viral hepatitis. In: *Communicable Diseases Transmitted Through Contact or by Unknown Means*. Vol 5. In: Hoff EC, ed. *Preventive Medicine in World War II*. Washington, DC: Office of The Surgeon General, US Department of the Army; 1960: 411–462.

12. Glass AJ. Psychosomatic medicine. In: *Infectious Diseases and General Medicine*. Vol 3. In: Havens WP, Jr., ed. *Internal Medicine in World War II*. Washington, DC: Office of The Surgeon General, US Department of the Army; 1968: 675–712.

13. Reister FA. *Battle Casualties and Medical Statistics: U.S. Army Experience in the Korean War*. Washington, DC: Office of The Surgeon General, US Department of the Army; 1973.

14. Chalmers TC, Lokhardt RD, Reynolds WE, et al. The treatment of acute infectious hepatitis. Controlled studies of the effects of diet, rest, and physical reconditioning on the acute course of the disease and on the incidence of relapse and residual abnormalities. *J Clin Invest*. 1953;34:1163–1245.

15. Neel S. *Medical Support of the U.S. Army in Vietnam 1965–1970*. Washington, DC: US Department of the Army; 1973.

16. Ognibene AJ, Barrett ON, Jr., eds. In: *General Medicine and Infectious Diseases*. Vol 2. *Internal Medicine in Vietnam*. Washington, DC: Office of The Surgeon General and Center for Military History, US Department of the Army; 1982.

17. Glass AJ. Lessons learned. In: *Zone of the Interior*. Vol 1. In: Glass AJ, Bernucci RJ, eds. *Neuropsychiatry in World War II*. Washington, DC: Office of The Surgeon General, US Department of the Army; 1966: 735–759.

18. Jones FD. Reactions to stress: Combat versus combat support troops. Washington, DC: Walter Reed Army Medical Center; 1977. Mimeograph.

19. Sternberg TH, Howard EB, Dewey LA, Padget P. Venereal diseases. In: *Communicable Diseases Transmitted Through Contact or by Unknown Means*. Vol 5. In: Hoff EC, ed. *Preventive Medicine in World War II*. Washington, DC: Office of The Surgeon General, US Department of the Army; 1960: 139–331.

20. Segal HE, Llewellyn CH, Irwin G, Bancroft WH, Boe GP, Balaban DJ. Hepatitis B antigen and antibody in the U.S. Army. Prevalence in health care personnel. *Am J Public Health*. 1976;66:667–671.

21. Withers BG, Kelley PW, McNeil JG, Cowan DN, Brundage JF. A brief review of the epidemiology of HIV in the U.S. Army. *Milit Med*. 1992;157:80–84.

22. Burrelli DF. HIV–1/AIDS and U.S. military manpower policy. In: Stanley J, Blair JD, eds. *Challenges in Military Health Care*. New Brunswick, NJ: Transaction Publishers; 1993.