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SUMMARY

Problem

Although the post-traumatic stress disorders of Vietnam veterans have been well documented, the psychological and environmental factors which gave rise to these and other psychiatric disorders remains to be clearly identified.

Objective

The object of this study is to explore the relationship between combat and psychiatric disorders by examining the medical case histories of U.S. Marines who were wounded-in-action in Vietnam to determine if and when they had also been hospitalized for psychiatric reasons. Specifically, we wished to determine when a psychiatric hospitalization occurred in relation to a combat-related wound or injury; if there were any significant differences in rates of psychiatric disorders among wounded and nonwounded Marines; and whether those hospitalized for psychiatric reasons were at increased risk for subsequently being wounded-in-action.

Approach

Records of all hospital admissions for active-duty Marines for the period 1965-1972 were examined and personnel having a combat-related wound or injury and/or a psychiatric hospitalization were identified. Rates of first hospitalization were calculated and standardized incidence ratios were used to obtain measures of risk.

Results

Results indicated that Marines wounded in Vietnam were at significant risk for having a psychiatric hospitalization relative to Marines in Vietnam who were not wounded. Most of the psychiatric first hospitalizations occurred prior to being wounded-in-action, however, suggesting that psychiatric patients were at risk for being subsequently wounded relative to Marines with no record of psychiatric hospitalization. This risk differed with respect to psychiatric diagnosis, however. Individuals with diagnoses of schizophrenia, depressive neuroses, and anxiety neuroses were less likely to return to combat duty than those with other primary diagnoses. This is attributed to variations in the practice of returning psychiatric patients to duty upon completion of treatment on the basis of primary diagnosis.

Conclusions

Elevated rates of psychiatric first hospitalizations among U.S. Marines wounded-in-action during the Vietnam conflict may be a function of the fear of being wounded rather than the wound itself. Once the individual is wounded and hospitalized, the fear is apparently diminished. The psychological distress associated with the fear of being wounded places individuals initially hospitalized for certain psychiatric disorders and then returned to duty at increased risk for subsequently being wounded-in-action, perhaps because of unresolved psychiatric problems. Military psychiatrists and other combat medical personnel need to take this into account when considering when patients should be returned to duty.

Psychiatric Disorders among U.S. Marines Wounded-in-Action in Vietnam

The traumatic impact of war on the mental health of military personnel is generally acknowledged. Numerous studies have documented this impact both during military conflicts and long after hostilities have ceased. In the latter instance, the veterans of the Vietnam conflict have displayed compelling evidence of post-traumatic stress disorders which have been implicated in higher than expected rates of drug and alcohol abuse, depression, unemployment, marital problems, aggressive behavior, arrests and convictions on criminal charges, suicides, and motor vehicle accidents among these individuals (Figley, 1978; Helzer et al., 1976; Lawrence et al., 1985; Lipkin et al., 1982; Yager et al., 1984). During the conflict itself, there is evidence of a direct relationship between the number of psychiatric disorders and the intensity of combat (Belenky et al., 1983; Glass, 1955; Levav et al., 1979; Palinkas and Coben, 1985). This relationship has traditionally been examined by comparing numbers of personnel treated or hospitalized for psychiatric reasons with the number of personnel wounded-in-action on the basis of either ratios of psychiatric casualties to battle injuries or rates of each type of casualty. Using these same methods, however, other studies have found either no relationship (Borus, 1974) or an inverse association between exposure to combat and the risk of being a psychiatric casualty (Levav et al., 1979; Palinkas and Coben, 1985), suggesting that it is the anticipation of combat rather than the actual battle experience that is associated with the risk of psychiatric disorder. This connection has recently been supported by a study which found that American men eligible for the draft during the years of the Vietnam conflict had higher than expected rates for suicides and motor vehicle accident deaths (Hearst et al., 1986).

The object of this study is to explore the relationship between combat and psychiatric disorders by examining the medical case histories of U.S. Marine Corps personnel who were wounded-in-action in Vietnam to determine if and when they had also been hospitalized for a psychiatric disorder. Specifically, we wish to answer three questions: (1) were there any significant differences in the rates of psychiatric hospitalizations in Vietnam among U.S. Marines who were wounded-in-action and Marines who were not wounded; (2) when did the psychiatric hospitalizations occur in relation to the hospitalization for a combat-related wound or injury; and (3) were those who were hospitalized for psychiatric reasons at increased risk for being subsequently wounded-in-action?

METHODS

The Naval Health Research Center maintains an Inpatient Medical Data File on all hospital admissions recorded for active duty U.S. Marine Corps personnel for the period 1965-1972. This file was searched for all hospital admissions which occurred while serving in Vietnam. Diagnoses prior to 1970 were in accordance with the Department of Defense Disease and Injury Codes (DDDIC). Diagnoses between 1970 and 1972 were in accordance with the Eighth Revision, International Classification of Disease Adapted for Use in the United States (ICDA-8). On the basis of these records, two groups of hospitalized personnel were identified. Combat casualties were defined as personnel with a primary diagnosis of accidents, poisonings, and violence (DDDIC and ICDA-8 Codes 800.0 - 999.9) and a combat-related cause code. Psychiatric casualties were defined as personnel hospitalized one or more times with a diagnosis of mental disorder (DDDIC Codes 300.0 - 327.9; ICDA-8 codes 290.0 - 315.9; 790, 793). Although these individuals may have been hospitalized more

than once for a combat-related wound or injury or a psychiatric disorder, only the first hospitalization and the primary diagnosis was examined in this study, thus resulting in one record per person for each category of hospitalization. These two groups of individuals were then matched to determine which individuals had a record of both conditions.

Psychiatric diagnoses from the two diagnostic classification systems (DDDIC and ICDA-8) were grouped into categories of comparable diagnoses such as personality disorders, schizophrenias, alcoholism, drug dependence, anxiety neurosis, affective and other psychoses, and transient situational disturbances. Age, sex, paygrade, length of service, race, military occupational specialty (MOS) of hospitalized personnel, and year hospitalized also were identified from this file. As only a small number of women Marine Corps personnel were present in Vietnam during this period, only men were considered in this study. Military occupational specialties or job codes were grouped into major categories such as infantry, artillery, administrative, and air support. Age, paygrade, and length of service also were grouped for descriptive purposes.

Populations at risk used in the calculation of crude incidence rates were obtained from strength figures published in the Annual Reports of the Secretary of Defense (1968, 1972) which indicated numbers from each service assigned to duty in Vietnam by quarter. Calculation of age-adjusted incidence rates was not possible because of the lack of age-specific population data on U.S. Marines in Vietnam who were at risk for either combat-related wounds and injuries or psychiatric disorders.

RESULTS

The Marine Corps Inpatient Medical Data File for the period between July 1965 and December 1972 contains the records of 78,756 Marines who were wounded-in-action and 8,835 Marines who were hospitalized for psychiatric reasons while serving in Vietnam. Descriptions of the demographic and service-related characteristics of these two groups have been provided elsewhere (Palinkas and Cohen, 1985). A search of the Marines who were wounded-in-action found that 2,369 of these individuals also had a record of a hospitalization for psychiatric reasons. A description of the demographic and service-related characteristics of these individuals is presented in Table 1. Most of these individuals were under the age of 24 (mean age = 20.7 years), junior enlisted (mean paygrade = 2.8) infantrymen with two years or less of service (mean years = 1.9) at the time of their combat-related hospitalization. The number of hospitalizations for combat-related wounds and injuries increased by year for this group, peaking in 1968, the year of the TET offensive.

In order to determine if Marines who were wounded-in-action were at risk for a psychiatric disorder relative to Marines who were not wounded, the rates of first hospitalization for psychiatric reasons of each group were compared to derive an odds ratio, an approximation of relative risk. Because of the lack of information on possible psychiatric hospitalizations which may have occurred prior to or after leaving Vietnam among the nonwounded group, only psychiatric hospitalizations which occurred while in Vietnam were examined for both groups. The results are contained in Table 2. The number of wounded Marines who also were hospitalized for psychiatric reasons while in Vietnam was 2,325. The WIA group had a significantly higher rate of total first hospitalizations than the nonwounded group. When these hospitalizations were examined by primary diagnosis, the rates of first hospitalizations for alcoholism, drug dependence, transient situational disturbances, acute situational maladjustment, physical disorders of presumed psychogenic origin,

Table 1. Demographic and Service-Related Characteristics of U.S. Marines Who Were Wounded-in-Action and Hospitalized for Psychiatric Reasons in Vietnam, 1965-1972

	N	%
Psychiatric Hospitalization in Vietnam	2,325	98.1
Psychiatric Hospitalization Elsewhere	44	1.9
Total Cases	2,369	100.0
<u>Age</u>		
17-19	830	36.1
20-24	1,312	57.1
25-29	98	4.3
30-34	29	1.3
35-39	20	0.9
40+	9	0.4
Missing Data	71	
<u>Race</u>		
White	1,967	83.0
Nonwhite	402	17.0
<u>Length of Service</u>		
1 year or less	1,457	63.4
2 years	475	20.1
3 years	169	7.4
4-5 years	77	3.4
6-7 years	50	2.2
8 years or more	69	3.0
Missing Data	72	
<u>Paygrade</u>		
E1-E3	1,920	81.2
E4-E6	405	17.1
E7-E9	16	0.7
Officers	24	1.0
Missing Data	4	
<u>Military Occupational Specialty</u>		
Administration	48	2.2
Intelligence	28	1.3
Infantry	1,892	85.1
Artillery	80	3.6
Utilities	21	0.9
Construction	82	3.7
Operations	63	2.8
Aviation Support	9	0.4
Pilots	1	0.0
Missing Data	145	
<u>Year Wounded</u>		
1965	36	1.5
1966	278	11.7
1967	632	26.7
1968	873	36.9
1969	430	18.2
1970	109	4.6
1971	10	0.4
1972	1	0.0

mental disorders not specified as psychotic associated with physical conditions, social maladjustment, and nervousness and debility were significantly higher among the WIA group than they were among the nonwounded group. However, the WIA group had significantly lower rates of first hospitalization for schizophrenia and anxiety neuroses.

Table 2. First Hospitalization Rates (per 1,000 person years) for Psychiatric Disorders by Diagnostic Category and WIA Status, U.S. Marines in Vietnam, 1965-1972

<u>Diagnostic Category</u>	<u>Wounded-in-Action Status</u>				Relative Risk	95% Confidence Limits	
	Wounded N	Wounded Rate	Not Wounded N	Not Wounded Rate		Lower	Upper
Alcoholism	100	1.3	200	0.8	1.63	1.24	2.02*
Psychotic Disorders of Physical Origin	15	0.2	67	0.3	0.67	0.30	1.04
Schizophrenia	114	1.4	724	2.8	0.50	0.40	0.60*
Affective/Other Psychoses	39	0.5	131	0.5	1.00	0.64	1.36
Anxiety Neuroses	273	3.5	1,063	4.1	0.85	0.74	0.96*
Depressive Neuroses	172	2.2	620	2.4	0.92	0.76	1.08
Other Neuroses	123	1.6	354	1.3	1.23	0.98	1.48
Personality Disorders	604	7.7	1,829	7.0	1.10	1.00	1.20
Drug Dependence	57	0.7	103	0.4	1.75	1.18	2.32*
Transient Situational Disturbances	35	0.4	42	0.2	2.00	1.10	2.90*
Combat Exhaustion	73	0.9	196	0.7	1.29	0.94	1.64
Acute Situational Maladjustment	249	3.2	488	1.9	1.68	1.42	1.94*
Observation Mental	99	1.3	272	1.0	1.30	1.00	1.60
Physical Disorder/Presumed Psychogenic Origin	124	1.6	207	0.8	2.00	1.55	2.45*
Special Symptoms Not Elsewhere Classified	57	0.7	129	0.5	1.40	0.96	1.84
Mental Disorders Not Specified as Psychotic							
Associated with Physical Conditions	124	1.6	40	0.2	8.00	5.15	10.85*
Social Maladjustment	22	0.3	0	0	-	-	- *
Nervousness and Debility	27	0.3	22	0.1	3.00	1.31	4.69*
All Other Psychiatric Conditions	18	0.2	23	0.1	2.00	0.77	3.23
Total Psychiatric First Hospitalizations	2,325	29.5+	6,510	24.8	1.19	1.13	1.25*
Population at Risk	78,756		262,420				

+Cases do not include 44 wounded men who had first psychiatric hospitalizations elsewhere.

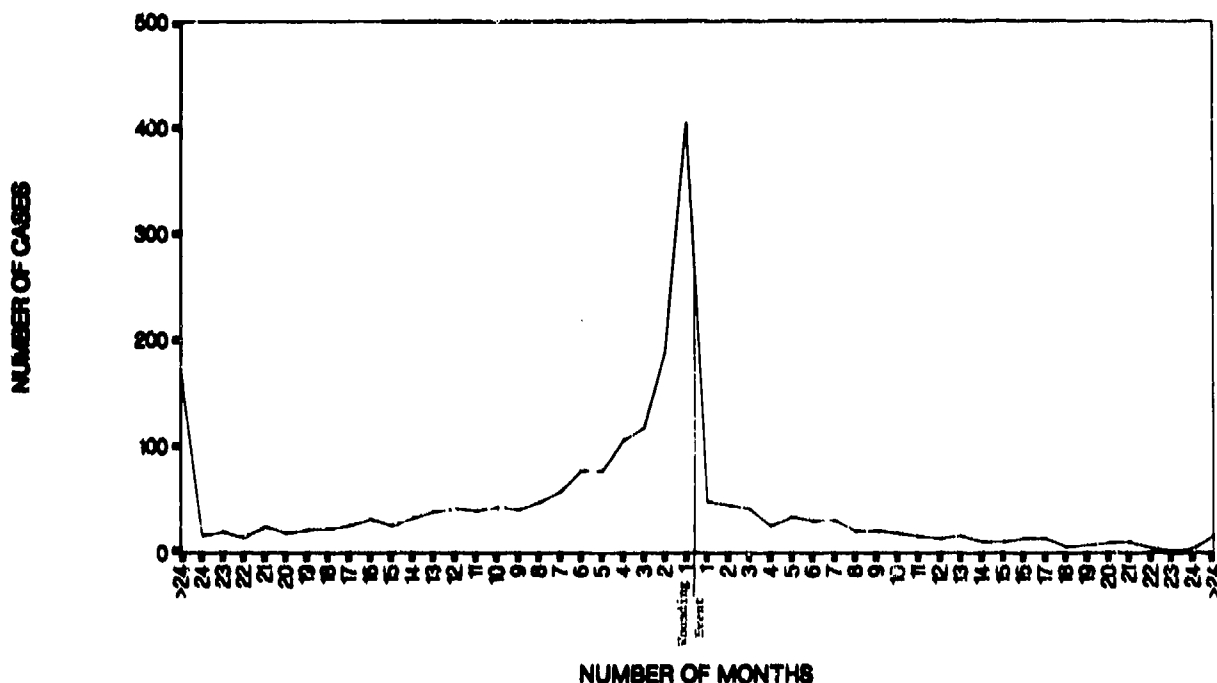
*p < .05

The next step in the analysis was to determine when a psychiatric hospitalization occurred in relation to a hospitalization for a combat-related wound or injury (the wounding event). The group of 2,369 individuals hospitalized for both reasons were divided into three subgroups. The first subgroup included 1,705 individuals identified as having been hospitalized for psychiatric reasons prior to the wounding event. Of this subgroup, 1,690 were hospitalized while in Vietnam and 404 or 24 percent were hospitalized within 30 days prior to being wounded-in-action. A second subgroup included 185 individuals who were given a psychiatric diagnosis (counted as their first psychiatric hospitalization) at the same time they were hospitalized for a combat-related wound or injury. All but 19 of these individuals were hospitalized in Vietnam. The third subgroup was comprised of 479 individuals who were hospitalized for psychiatric reasons after their hospitalization for a combat-related wound or injury. All but 10 of these individuals were hospitalized in Vietnam.

Figure 1 illustrates the range of time between the psychiatric hospitalization and hospitalization for a combat-related wound or injury by monthly intervals. The number of psychiatric first hospitalizations rises sharply in the first four months prior to the wounding event. This increase peaks within 30 days of the wounding event and then sharply declines. Within a month after this event, the number of psychiatric first hospitalizations begins to level off and remains relatively constant for the next 23 months of observation.

Figure 1. Psychiatric First Hospitalizations in Relation to Hospitalization for a Combat-related Wound or Injury

U.S. Marines Wounded-in-Action in Vietnam, 1965-1972



This examination of when a psychiatric hospitalization occurred places the comparison of rates of first hospitalization in better perspective. The observation that most of the psychiatric hospitalizations among the wounded Marines occurred prior to the wounding event suggested that there may be variations in exposure to combat among Marines hospitalized in Vietnam for different psychiatric disorders. A hospitalization for certain types of psychiatric disorders such as schizophrenia may result in a medical evacuation from Vietnam, discharge, or transfer back to the United States, thus removing the individual from further exposure to combat and the risk of being wounded-in-action. The rates of first hospitalization for this diagnosis, therefore, would be expected to be less among the WIA group than among the nonwounded group. As Table 2 indicated, the rates of first hospitalization for several other diagnostic categories were much higher among the WIA group than among the nonwounded group.

To further explore this possibility, we first examined the treatment disposition by diagnostic category of all personnel hospitalized for psychiatric reasons while serving in Vietnam. The results of this analysis are presented in Table 3. Although the category "discharge from hospital" does not indicate whether an individual returned to duty upon discharge from the

reporting facility or whether he was reassigned or transferred back to the United States, the category "transfer to other medical facilities" provides an approximation of differences in the probability of being medically evacuated from Vietnam based on the type of primary diagnosis. As this table indicates, almost 60 percent of individuals with diagnoses of schizophrenia were medically evacuated from Vietnam, followed by depressive neuroses, affective and other psychoses, other neuroses, psychotic disorders of physical origin, special symptoms not elsewhere classified, and anxiety neuroses. In each of these diagnostic categories, the first psychiatric hospitalization rates among the nonwounded Marines in Vietnam were significantly less than or the same as the rates among the wounded Marines. In the remaining diagnostic categories, the first hospitalization rates among the wounded Marines were the same as or significantly greater than the rates among the nonwounded Marines.

Table 3. Disposition of U.S. Marines Hospitalized for Psychiatric Reasons in Vietnam by Primary Diagnosis, 1965-1972

Diagnostic Category	Disposition					
	Evacuated ¹		Discharged ²		Died ³	
	N	%	N	%	N	%
Alcoholism	33	11.0	267	89.0	0	0
Psychotic Disorders of Physical Origin	39	47.6	43	52.4	0	0
Schizophrenia	511	61.0	326	38.9	1	0.1
Affective/Other Psychoses	88	51.8	81	47.6	1	0.6
Anxiety Neuroses	575	43.0	761	57.0	0	0
Depressive Neuroses	432	54.5	360	45.5	0	0
Other Neuroses	238	49.9	239	50.1	0	0
Personality Disorders	795	32.7	1,637	67.3	1	0.0
Drug Dependence	31	19.4	129	80.6	0	0
Transient Situational Disturbances	9	11.7	68	88.3	0	0
Combat Exhaustion	82	30.5	187	69.5	0	0
Acute Situational Maladjustment	198	26.9	539	73.1	0	0
Observation Mental	101	27.2	270	72.8	0	0
Physical Disorder/Presumed Psychogenic Origin	121	36.6	210	63.4	0	0
Special Symptoms Not Elsewhere Classified	82	44.1	104	55.9	0	0
Mental Disorders Not Specified as Psychotic						
Associated with Physical Conditions	34	20.8	128	78.0	2	1.2
Social Maladjustment	0	0	22	100.0	0	0
Nervousness and Debility	10	20.4	36	73.5	3	6.1
All Other Psychiatric Conditions	16	39.0	25	61.0	0	0
Total Psychiatric First Hospitalizations	3,395	38.4	5,432	61.5	8	0.1

¹To another medical facility outside Vietnam.

²From reporting facility

³Died of wounds while at reporting facility

We then compared the observed number of first hospitalizations for a combat-related wound or injury among U.S. Marines who had previously been hospitalized for psychiatric reasons in Vietnam with the total rate of first hospitalizations for combat-related wounds and injuries (230.8 per 1,000 men per year) among all U.S. Marines in Vietnam between 1965 and 1972. This comparison took the form of standardized incidence ratios (SIRs) for the psychiatric casualties by diagnostic category. The population at risk was defined as all Marines hospitalized in Vietnam for psychi-

atric reasons except those who were diagnosed as having a psychiatric disorder at the same time or after they had been wounded-in-action.

The results are presented in Table 4. Individuals hospitalized in Vietnam for alcoholism, transient situational disturbances, acute situational maladjustments, mental disorders not specified as psychotic associated with physical conditions, social maladjustment, and nervousness and debility were at significant risk for a subsequent hospitalization due to a combat-related wound or injury. Among those who were hospitalized in Vietnam with a primary diagnosis of social maladjustment, all were subsequently wounded-in-action. On the other hand, individuals hospitalized in Vietnam with a primary diagnosis of schizophrenia, anxiety neurosis, or depressive neurosis were less likely than expected to have a subsequent hospitalization for a combat-related wound or injury.

Table 4. Standardized Incidence Ratios (SIRs) of Combat-Related Wounds and Injuries among U.S. Marines Hospitalized for Psychiatric Reasons in Vietnam, 1965-1972

Diagnostic Category	Popu- lation at Risk	Cases			95% Con- fidence Limits	
		O	E	SIR	Lower	Upper
Alcoholism	274	74	63	1.17	0.90	1.44*
Psychotic Disorders of physical origin	80	13	18	0.72	0.33	1.11
Schizophrenia	823	99	190	0.52	0.42	0.62*
Affective/Other Psychoses	165	34	38	0.89	0.59	1.19
Anxiety Neuroses	1,248	185	288	0.64	0.55	0.73*
Depressive Neuroses	755	135	174	0.78	0.65	0.91*
Other Neuroses	444	90	102	0.88	0.70	1.06
Personality Disorders	2,229	400	514	0.78	0.70	0.86*
Drug Dependence	150	47	35	1.34	0.96	1.72
Transient Situational Disturbances	71	29	16	1.81	1.15	2.47*
Combat Exhaustion	243	47	56	0.84	0.60	1.08
Acute Situational Maladjustment	671	183	155	1.18	1.01	1.35*
Observation Mental	340	68	78	0.87	0.66	1.08
Physical Disorder/Presumed Psychogenic Origin	287	80	66	1.21	0.94	1.48
Special Symptoms Not Elsewhere Classified	167	38	39	0.97	0.66	1.28
Mental Disorders Not Specified as Psychotic						
Associated with Physical Conditions	149	109	34	3.21	2.61	3.81*
Social Maladjustment	22	22	5	4.40	2.56	6.24*
Nervousness and Debility	43	21	10	2.10	1.20	3.00*
All Other Psychiatric Conditions	39	16	9	1.78	0.91	2.65
Total Psychiatric First Hospitalizations	8,200 ²	1,690	1,893	0.89	0.85	0.93*

*p < .05

¹Expected number of cases are based on the rate of first hospitalizations for combat-related wounds and injuries (230.8 per 1,000) among all U.S. Marine personnel in Vietnam, 1965-1972.

²Does not include 635 men who had first psychiatric hospitalizations at the same time or after wounding event.

DISCUSSION

On the basis of the results presented above, it appears that U.S. Marines who were wounded-in-action in Vietnam were at significant risk for having a psychiatric hospitalization in Vietnam relative to Marine Corps personnel in Vietnam who were not wounded. Most of these psychiatric first hospitalizations occurred prior to being wounded-in-action in a pattern that suggested a

direct relationship between a psychiatric disorder and the risk of being wounded in combat. This relationship was confirmed by the significant standardized incidence ratios of a first hospitalization for a combat-related wound or injury among personnel who previously were hospitalized for psychiatric reasons in Vietnam.

The results obtained in this study reflect the impact of the principles of combat psychiatry and the procedures involving the disposition of military personnel on the basis of their particular primary diagnosis. In Vietnam the standard principles of combat psychiatry included the following: (1) treatment in the combat area; (2) adequate sedation and replenishment of physical deprivation; (3) ventilation and supportive directive psychotherapy; (4) discouragement of invalidism; and (5) attempt to return to duty as rapidly as possible (Strange, 1968; Tiffany, 1967). With the exception of the use of sedation, these principles remain as part of the doctrine of combat psychiatry in the belief that if casualties are treated as "patients" and evacuated to the rear, they most frequently maintain their symptoms longer, rarely return to the same duty, or may not return at all (Glass, 1955; Hilber, 1984). Previous studies also have indicated that a soldier who experiences a psychiatric breakdown but who succeeds in returning to his unit is not at significantly greater risk for another psychiatric breakdown (Beebe and Apple, 1973; Solomon et al., 1986).

These principles were not uniformly applied to all diagnoses, however. In a study of psychiatric casualties treated aboard the USS REPOSE during the first seven months of her operations off Vietnam in 1966 (Strange and Arthur, 1967), all of the individuals with diagnoses of psychoses were evacuated and not returned to duty. About one-half of the individuals with diagnoses of personality disorders and 78 percent of the combat fatigue cases were returned to duty upon completion of treatment. As noted above, Marines who were wounded-in-action had significantly fewer first hospitalizations for schizophrenia and anxiety neurosis than the nonwounded group. From the evidence presented in Table 3, it appears that individuals with these diagnoses were less likely to return to combat duty than individuals with other psychiatric diagnoses. Once a person was hospitalized for schizophrenia, anxiety neuroses, depressive neuroses, or personality disorders, his risk of being subsequently hospitalized for a combat-related wound or injury was significantly reduced. However, individuals with certain other primary diagnoses who were typically returned to duty upon completion of treatment displayed significantly elevated rates of subsequent combat-related wounds and injuries. These included the diagnoses of alcoholism, transient situational disturbances, acute situational maladjustment, mental disorders not specified as psychotic associated with physical conditions, social maladjustment, and nervousness and debility. The goal of returning psychiatric casualties to duty upon completion of treatment, therefore, may be a laudable one from the standpoint of minimizing the risk of long-term psychiatric impairment, but it may also increase the risk of serious battle injury and long-term physical impairment for some of these individuals.

The results of this study also provide us with some additional insight into the relationship between psychological distress and combat casualties. Research on disasters has found that the incidence of emotional disorders increases after the occurrence of physical trauma (Hoiberg and McCaughey, 1984; Wilkinson, 1983). This increase was not observed among the wounded Marines, however. Instead, the distribution of psychiatric first hospitalizations both before and after a

hospitalization for a battle wound or injury suggests a positive relationship between psychological distress and combat casualties. The number of psychiatric first hospitalizations was observed to peak during the month prior to the wounding event and, in comparison with the numbers of psychiatric first hospitalizations which occurred prior to the wounding event, the numbers of psychiatric first hospitalizations which occurred afterward were relatively small. This pattern suggests that psychological distress in a combat environment occurs with greater frequency and intensity before the wounding event than it does afterwards. This may occur because the injury itself or the medical treatment of the injury provides the patient with rest and a form of emotional catharsis, releasing the psychological distress created by exposure to combat, even though in the long run the physical disabilities resulting from the injuries may themselves be a source of psychological distress. It also may occur because the injury itself removes the victim from further exposure to the source of stress.

Whatever the reason for the post injury decline in numbers of psychiatric hospitalizations, the results lead us to question the use of numbers of wounded-in-action as a measure of combat exposure. If the risk of a psychiatric disorder is related to exposure in combat, then the number of wounded-in-action is not a good measure of exposure. If, on the other hand, the number of wounded is a good measure of exposure, then exposure does not place one at risk for a psychiatric disorder but rather reduces the risk. Given substantial evidence, cited above, supporting the relationship between combat exposure and psychiatric disorders, we must accept the first possibility or, at the very least, advise caution in the use of the number of wounded-in-action as a measure of exposure. The measure was derived from studies of neuropsychiatric casualties during World War II (Glass, 1955), but as Tiffany (1967) notes, the type of combat in Vietnam was quite different from that which produced psychiatric casualties in World War II and Korea. The fighting in Vietnam was brief, intense, and sporadic, with periods of relative calm and safety interspersed. While the measure may therefore be appropriate in large-scale military conflicts, it may not be appropriate for conflicts such as the one in Vietnam.

The possibility that the results obtained in this study are artifacts of methodological limitations must also be entertained. A major weakness of this study lies in its cross-sectional design. The Marine Corps Inpatient Medical Data File contains only records of hospital admissions among active-duty Marines during the 1965-1972 period. Psychiatric first hospitalizations which occurred either before or after this time period were not included in this study. Moreover, data were unavailable for individuals hospitalized for psychiatric reasons during this period but who were not active-duty Marines at the time of hospitalization. Thus, hospitalizations which occurred after being discharged from the Marine Corps are not included in our study, which would help to account for the relatively small number of psychiatric first hospitalizations observed after a hospitalization for a combat-related wound or injury. The delayed presentation of post-traumatic stress disorders among Vietnam war veterans (Van Putten and Emory, 1973) and survivors of disasters (McFarlane, 1986) indicate that prolonged follow-up of a population experiencing environmental stress or disaster may be necessary before conclusions are reached about the presence or absence of psychiatric disorders.

It is also likely that not all Marines who were treated on an inpatient basis for psychiatric disorders were included in the Inpatient Medical Data File, resulting in further underenumeration.

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Marines wounded in Vietnam were at significant risk for having a psychiatric hospitalization relative to Marines in Vietnam who were not wounded. Most of the psychiatric first hospitalizations occurred prior to being wounded-in-action, however, suggesting that psychiatric patients were at significant risk for being subsequently wounded relative to Marines with no record of psychiatric hospitalization. This risk differed with respect to psychiatric diagnosis, however. Individuals with diagnoses of schizophrenia, depressive neuroses, and anxiety neuroses were less likely to return to combat duty than those with other primary diagnoses. This is attributed to variations in the practice of returning psychiatric patients to duty upon completion of treatment. *Keywords:*

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