



**FIELD MEDICAL SERVICE OFFICER  
STUDENT HANDBOOK**

**“THE BEST FORM OF TROOP  
WELFARE IS TOUGH, REALISTIC  
TRAINING”**

**REVISED JULY 2009**

# Field Medical Service Officer (FMSO) Course

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**UNITED STATES MARINE CORPS  
Field Medical Training Battalion  
Camp Pendleton**

**FMSO 1101**

**IDENTIFY THE RANKS AND ROLES OF MEMBERS OF THE MARINE CORPS**

**TERMINAL LEARNING OBJECTIVES**

1. In a military environment, **identify the organizational rank structure of Armed Forces personnel**, per the reference. (FMSO-HSS-1101)

**ENABLING LEARNING OBJECTIVES**

1. Without the aid of reference, given a description or list, **describe the basic organizational structure of the USMC enlisted ranks**, within 80 percent accuracy, per The Marine Officer's Guide. (FMSO-HSS-1101a)
2. Without the aid of reference, given a description or list, **describe the basic organizational structure of the USMC officer ranks**, within 80 percent accuracy, per The Marine Officer's Guide. (FMSO-HSS-1101b)

## **Introduction**

There are many customs and courtesies involved in being a Naval Officer. Identification of military rank and seniority is an important part of rendering those courtesies. Each branch of the Armed Forces uses their own set of rank insignias to identify each rank within its organization. Appendix 1 has a picture of each rank insignia used throughout the Armed Forces. Special attention should be paid to the identification of the Naval and Marine Corps ranks, as these are the primary insignias you will be seeing in your daily tasks. However, if you are stationed or deployed to a location with other members of the Armed Forces, refer to appendix 1 to better familiarize yourself with their rank insignias.

The Marine Corps and Navy have similar rank structures for enlisted members. The Marine Corps uses Junior Enlisted, Non-Commissioned Officer (NCO's), and Staff Non-Commissioned Officer (SNCO). The Navy uses Non-Petty Officer, Petty Officer, and Chief Petty Officer. Likewise, the officer ranks have similar structures: Company Grade, Field Grade, and General Grade Officers. Their commonalities and differences will be discussed in detail.

### **1. ENLISTED RANKS**

We will concentrate our discussion on the Fleet Marine Force and the Sailors assigned to it. As stated above, enlisted personnel are separated into three broad categories, Junior Enlisted, NCO's, and SNCO's.

Junior Enlisted (E1 to E3): new personnel to the Armed Forces who need direct supervision, mentoring, and training.

NCO (E4 to E5): personnel who have received formal leadership training and have direct supervision authority over junior enlisted personnel. Members in these pay grades have more rights and responsibilities than junior enlisted personnel. However, with responsibility comes more accountability.

SNCO (E6 to E9): senior enlisted personnel who have direct supervision authority over junior enlisted and NCO's. This is the rank where a Marine passes a significant career milestone. Becoming a SNCO is equivalent to obtaining the status of a Navy Chief Petty Officer. When assigned to the Marine Corps Operating Forces, Navy E6's are considered a SNCO.

There are many different names you may hear when referring to certain people in the Marine Corps Operating Forces. It should be stated that calling a person by one of these nicknames requires a working relationship with that person. If you were addressing a person for the first time, one would call that person by their rank and last name.

Gunny: nickname for a Gunnery Sergeant in the USMC

Top: nickname for a Master Sergeant in the USMC

Master Guns: nickname for a Master Gunnery Sergeant in the USMC

### **Senior Enlisted**

When a Marine reaches the rank of Gunnery Sergeant (E7), they have the option of advancing to either First Sergeant or Master Sergeant, both of which are E8's. The difference between the two pay grades is that a First Sergeant takes on a more administrative role in the battalion. A First

Sergeant or Sergeant Major will command all of the enlisted, hold formations, instruct platoon sergeants, advise the Commander, and assist in the training of all enlisted members. The Master Sergeant or Master Gunnery Sergeant will continue to work in his/her primary Military Occupational Specialty (MOS) and is considered a technical expert in their MOS.

## 2. **OFFICER RANKS**

As with the enlisted ranks, we will concentrate our discussion on the Marine Corps Officer ranks.

Company Grade: All officers WO to O3. The Warrant Officer community has a distinct difference when it comes to Warrant Officer and Chief Warrant Officer. A Warrant Officer is a W1. A Chief Warrant Officer is W2 to W5.

Line Grade: All officers O4 to O6.

General Grade: All officers O7 to O10.

There are many different names you may hear when in the Marine Corps Operating Forces.

Lieutenant (Lt): nickname for both a 1<sup>st</sup> Lieutenant and a 2<sup>nd</sup> Lieutenant. Notice the abbreviation for Lieutenant in the Marine Corps is upper case "L" and lower case "t". There are many differences between the correct abbreviations of Navy and Marine Corps personnel. See appendix 2 for a list of correct abbreviations for each service.

Gunner: nickname for the Battalion S3 Chief Warrant Officer. This person is considered the weapons and range expert of the battalion.

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**APPENDIX 1: ARMED FORCES RANK INSIGNIAS**

**Junior Enlisted**

PAYGRADE	MARINE CORPS	NAVY	ARMY	AIR FORCE
E-1	Private NONE	Seaman Recruit NONE	Private NONE	Airman Basic NONE
E-2	Private First Class 	Seaman Apprentice 	Private 	Airman 
E-3	Lance Corporal 	Seaman 	Private First Class 	Airman First Class 

**Non-Commissioned Officer (NCO)**

PAYGRADE	MARINE CORPS	NAVY	ARMY	AIR FORCE
E-4	Corporal 	Petty Officer Third Class HAT / COLLAR 	Corporal  Specialist 	Senior Airman 
E-5	Sergeant 	Petty Officer Second Class HAT / COLLAR 	Sergeant 	Staff Sergeant 

## Staff Non-Commissioned Officer (SNCO)

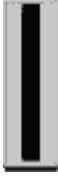
PAYGRADE	MARINE CORPS	NAVY	ARMY	AIR FORCE
E-6	<p>Staff Sergeant</p> 	<p>Petty Officer First Class</p> <p>HAT / COLLAR</p> 	<p>Staff Sergeant</p> 	<p>Technical Sergeant</p> 
E-7	<p>Gunnery Sergeant</p> 	<p>Chief Petty Officer</p> <p>HAT / COLLAR</p> 	<p>Sergeant First Class</p> 	<p>Master Sergeant</p>  <p>First Sergeant</p> 
E-8	<p>Master Sergeant (Technical)</p>  <p>First Sergeant (Administrative)</p> 	<p>Senior Chief Petty Officer</p> <p>HAT / COLLAR</p> 	<p>Master Sergeant (Technical)</p>  <p>First Sergeant (Administrative)</p> 	<p>Senior Master Sergeant (Technical)</p>  <p>First Sergeant (Administrative)</p> 

PAYGRADE	MARINE CORPS	NAVY	ARMY	AIR FORCE
E-9	<b>Master Gunnery Sergeant (Technical)</b> 	<b>Master Chief (Technical)</b> 	<b>Sergeant Major (Technical)</b> 	<b>Command Chief Master Sergeant (Technical)</b> 
	<b>Sergeant Major (Administrative)</b> 	<b>Command Master Chief (Administrative)</b> 	<b>Command Sergeant Major (Administrative)</b> 	<b>First Sergeant (Administrative)</b> 
E-9	<b>Sergeant Major of the Marine Corps</b> 	<b>Master Chief Petty Officer of the Navy (MCPON)</b> 	<b>Sergeant Major of the Army</b> 	<b>Chief Master Sergeant of the Air Force</b> 

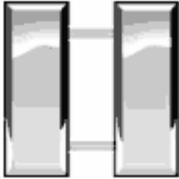
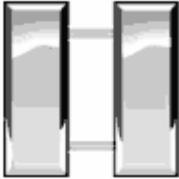
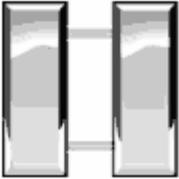
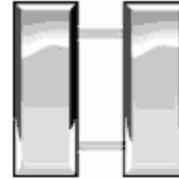
**OFFICER RANKS**

Marine Corps Officers wear gold or silver rank insignias on the shoulder lapel of their coats or overcoats. They also wear small replicas of the insignia on their shirt collar. The color and shape of the insignia varies with their rank.

**Company Grade Officer**

<b>PAYGRADE</b>	<b>MARINE</b>	<b>NAVY</b>	<b>ARMY</b>	<b>AIR FORCE</b>
<b>W-1</b>		There are no W-1 Warrant Officers in the Navy		There are no Warrant Officers in the Air Force
<b>W-2</b>				There are no Warrant Officers in the Air Force
<b>W-3</b>				There are no Warrant Officers in the Air Force
<b>W-4</b>				There are no Warrant Officers in the Air Force
<b>W-5</b>				There are no Warrant Officers in the Air Force

## Company Grade Officers

PAYGRADE	MARINE	NAVY	ARMY	AIR FORCE
O-1	2 <sup>nd</sup> Lieutenant 	Ensign 	2 <sup>nd</sup> Lieutenant 	2 <sup>nd</sup> Lieutenant 
O-2	1 <sup>st</sup> Lieutenant 	Lieutenant Junior Grade 	1 <sup>st</sup> Lieutenant 	1 <sup>st</sup> Lieutenant 
O-3	Captain 	Lieutenant 	Captain 	Captain 

## Field Grade Officers

PAYGRADE	MARINE	NAVY	ARMY	AIR FORCE
O-4	Major 	Lieutenant Commander 	Major 	Major 
O-5	Lieutenant Colonel 	Commander 	Lieutenant Colonel 	Lieutenant Colonel 
O-6	Colonel 	Captain 	Colonel 	Colonel 

## General Grade Officers

<b>PAYGRADE</b>	<b>MARINE</b>	<b>NAVY</b>	<b>ARMY</b>	<b>AIR FORCE</b>
<b>O-7</b>	<b>Brigadier General</b> 	<b>Rear Admiral (Lower half)</b> 	<b>Brigadier General</b> 	<b>Brigadier General</b> 
<b>O-8</b>	<b>Major General</b> 	<b>Rear Admiral (Upper half)</b> 	<b>Major General</b> 	<b>Major General</b> 
<b>O-9</b>	<b>Lieutenant General</b> 	<b>Vice Admiral</b> 	<b>Lieutenant General</b> 	<b>Lieutenant General</b> 
<b>O-10</b>	<b>General</b> 	<b>Admiral</b> 	<b>General</b> 	<b>General</b> 

**Note:** A memory aid to remember the seniority of general officers is: Be My Little General for Brigadier, Major, Lieutenant, and General.

Each branch of the Armed Forces has a senior officer for their respective service:

- Marines: Commandant of the Marine Corps
- Navy: Chief of Naval Operations
- Army: Chief of Staff of the Army
- Air Force: Chief of Staff of the Air Force

## **APPENDIX 2: ABBREVIATIONS FOR ARMED FORCES PERSONNEL**

### **Navy Officers**

<u>Rank</u>	<u>Abbreviation</u>
Admiral	ADM
Vice Admiral	VADM
Rear Admiral (Upper and Lower)	RADM
Captain	CAPT
Commander	CDR
Lieutenant Commander	LCDR
Lieutenant	LT
Lieutenant Junior Grade	LTJG
Ensign	ENS
Chief Warrant Officer	CWO5
	CWO4
	CWO3
	CWO2

### **Marine Corps, Air Force, and Army Officers**

<u>Rank</u>	<u>Marines</u>	<u>Air Force</u>	<u>Army</u>
General	Gen	Gen	GEN
Lieutenant General	LtGen	LtGen	LTG
Major General	MajGen	Maj Gen	MG
Brigadier General	BGen	Brig Gen	BG
Colonel	Col	Col	COL
Lieutenant Colonel	LtCol	Lt Col	LTC
Major	Maj	Maj	MAJ
Captain	Capt	Capt	CPT
First Lieutenant	1stLt	1 <sup>st</sup> Lt	1LT
Second Lieutenant	2ndLt	2 <sup>nd</sup> Lt	2LT
Chief Warrant Officer 5	CWO5		CW5
Chief Warrant Officer 4	CWO4		CW4
Chief Warrant Officer 3	CWO3		CW3
Chief Warrant Officer 2	CWO2		CW2
Warrant Officer	WO		WO1

## **APPENDIX 2: ABBREVIATIONS FOR ARMED FORCES PERSONNEL**

### **Navy Enlisted**

<u>Rank</u>	<u>Abbreviation</u>
Master Chief Petty Officer of the Navy	MCPON
Command Master Chief	CMDCM
Master Chief Petty Officer	MCPO
Senior Chief Petty Officer	SCPO
Chief Petty Officer	CPO
Petty Officer First Class	PO1
Petty Officer Second Class	PO2
Petty Officer Third Class	PO3
Airman (includes Apprentice and Recruit)	AN, AA, or AR
Constructionman (includes Apprentice and Recruit)	CN, CA, or CR
Fireman (includes Apprentice and Recruit)	FN, FA, or SR
Hospitalman (includes Apprentice and Recruit)	HN, HA, or HR
Seaman (includes Apprentice and Recruit)	SN, SA, or SR

### **Marine Enlisted**

<u>Rank</u>	<u>Abbreviation</u>
Sergeant Major of the Marine Corps	SgtMaj
Sergeant Major	SgtMaj
Master Gunnery Sergeant	MGySgt
First Sergeant	1stSgt
Master Sergeant	MSgt
Gunnery Sergeant	GySgt
Staff Sergeant	SSgt
Sergeant	Sgt
Corporal	Cpl
Lance Corporal	LCpl
Private First Class	PFC
Private	Pvt

## **APPENDIX 2: ABBREVIATIONS FOR ARMED FORCES PERSONNEL**

### **Army Enlisted**

<u>Rank</u>	<u>Abbreviation</u>
Sergeant Major of the Army	SMA
Command Sergeant Major	CSM
Sergeant Major	SGM
First Sergeant	1SG
Master Sergeant	MSG
Sergeant First Class	SFC
Staff Sergeant	SSG
Sergeant	SGT
Specialists	SPC
Corporal	CPL
Private First Class	PFC
Private	PVT

### **Air Force Enlisted**

<u>Paygrade</u>	<u>Abbreviation</u>
Chief Master Sergeant of the Air Force	CMSAF
Chief Master Sergeant	CMSgt
Senior Master Sergeant	SMSgt
Master Sergeant	MSgt
Technical Sergeant	TSgt
Staff Sergeant	SSgt
Senior Airman	SrA
Airman First Class	A1C
Airman	Amn
Airman Basic	AB

**UNITED STATES MARINE CORPS  
FIELD MEDICAL TRAINING BATTALION  
Camp Pendleton, Ca**

**FMSO 1102**

**Identify USMC Organizational Structure and Chain of Command**

a. **TERMINAL LEARNING OBJECTIVE(S):**

1. In a military environment, identify organizational structures within the Marine Corps Operating Forces to meet mission requirements, per the reference. (FMSO-HSS-1102)

b. **ENABLING LEARNING OBJECTIVE(S):**

1. Without the aid of reference given a description or list, identify the two parallel chains of command within the Marine Corps to an eighty percent accuracy, per MCRP 5-12D. (FMSO-HSS-1102a)

2. Without the aid of reference, given a description or list, identify the four broad categories of the Marine Corps to an eighty percent accuracy, per MCRP 5-12D. (FMSO-HSS-1102b)

3. Without the aid of reference, given a description or title, identify the four core elements of a MAGTF to an eighty percent accuracy, per MCRP 5-12D. (FMSO-HSS-1102c)

4. Without the aid of reference, given a description or title, identify the types of MAGTF to an eighty percent accuracy, per MCRP 5-12D. (FMSO-HSS-1102d)

5. Without the aid of reference, given a description or list, identify the functional areas of operation within MAGTF elements to an eighty percent accuracy, per MCRP 5-12D. (FMSO-HSS-1102e)

## **INTRODUCTION:**

The Marine Corps, within the Department of the Navy, is organized as a general purpose “force in readiness” to support national needs. Deploying for combat as a combined-arms Marine Air Ground Task Force (MAGTF), the Marine Corps provides the National Command Authority (NCA) with a responsive force that can conduct operations across the spectrum of conflict. The Marine Corps’ most important responsibility is to win the nation’s battle.

### **1. TWO PARALLEL CHAINS OF COMMAND IN THE MARINE CORP**

a. Service Chain of Command (see appendix 1, figure 1)

- (1) President
- (2) Secretary of Defense
- (3) Secretary of the Navy
- (4) Commandant of the Marine Corps

b. Operational Chain of Command (see appendix 1, figure 2)

- (1) President
- (2) Secretary of Defense
- (3) Commanders of Combatant Commands

### **2. FOUR BROAD CATEGORIES OF THE MARINE CORPS**

a. Headquarters, U.S. Marine Corps

- (1) Commandant and staff are responsible for administration, discipline, internal organization, training requirements, efficiency, and readiness of the Marine Corps.

b. Operating Forces (see appendix 1, figure 3)

- (1) Marine Corps Forces (MARFOR)- The MARFOR is the balance force of combined arms comprising land, air, and service elements of the Marine Corps. It is organized as Marine Air-Ground Task Forces (MAGTF) and is either employed as part of naval expeditionary forces or separately as part of larger joint or combined forces.

MARFOR Commanders are subject to the control of the Navy Fleet Commanders and may serve as Commanding Generals of Fleet Marine Force (FMF). MARFOR commands are divided into two major combatants MARFORPAC and MARFORCOM.

- (a) MARFOR Pacific (MARFORPAC)
  - 1. Headquarters at Camp H. M Smith, HI
  - 2. Commands all Marine Corps operational and shore based commands in the Pacific theater.
  
- (b) MARFOR Command (MAFORCOM)
  - 1. Headquarters at Norfolk, VA
  - 2. Commands all Marine Corps operational and shore based commands in the Atlantic, Southern and European theater.
  
- (c) Marine Corps Security Forces (MCSF) at Naval installations
  
- (d) Marine Security Guard (MSG) detachments at embassies and consulates around the globe.
  
- c. Marine Corps Reserve (MARFORRES) (see appendix 1, figure 4)
  - (1) MARFORRES can augment and reinforce operation in which MARFOR participates. MARFORRES is located at New Orleans, LA.
    - (a) 4<sup>th</sup> Marine Division (MARDIV)
    - (b) 4th Marine Aircraft Wing (MAW)
    - (c) 4<sup>th</sup> Marine Logistics Group (MLG)
  
- d. Supporting Establishments (see appendix1, figure 5)
  - (1) The Marine Corps supporting establishments consist of those personnel, bases, and activities that support the Marine Corps Operating Forces.
    - (a) Marine Corps Recruiting Command
    - (b) Marine Corps Combat Development Command
    - (c) Marine Corps Systems Command
    - (d) Training Activities and Formal Schools

### **3. FOUR CORE ELEMENTS OF MARINE AIR-GROUND TASK FORCE (MAGTF)**

The MAGTF is a balanced, air-ground combined arms task organization of Marine Corps forces under a single commander, structured to accomplish a specific mission. It is the Marine Corps' organization for missions across the range of military operations. It is designed to fight while having the ability to prevent conflicts and control crisis.

MAGTF's are flexible, task-organized forces that are capable of responding rapidly to a broad range of crisis and conflict situations. The MAGTF is primarily organized and equipped to conduct amphibious operations as part of naval expeditionary forces.

MAGTF's are also capable of sustained combat operations ashore. Each MAGTF, regardless of size or mission has the same basic structure.

#### **a. Four (4) Core Elements of a MAGTF**

##### **(1) Command Element (CE)**

Role - It is task organized to provide command and control capabilities (including intelligence and communications) necessary for effective planning, direction, and execution of all operations.

##### **(2) Ground Combat Element (GCE)**

Role - Its mission is to execute amphibious assault operations and such operations as may be directed.

##### **(3) Aviation Combat Element (ACE)**

Role - Its mission is task organized to provide a flexible and balanced aviation organization that is capable of providing the full range of aviation operations in a variety of without the requirement for pre-positioned support control, and logistical facilities.

##### **(4) Logistics Combat Element (LCE)**

Role - It is a composite grouping of functional components that provides Logistics Combat Support above the organic capability of supported units to all elements of the MEF.

### **3. TYPES OF MAGTF AND LOCATION**

There are four (4) basic MAGTF organizations (Marine Expeditionary Force, Marine Expeditionary Brigade, Marine Expeditionary Unit and Special Purpose MAGTF).

a. Marine Expeditionary Force (MEF) (see appendix 1, figure 7)

- (1) Definition of Capabilities - The largest standing (Exists in peacetime and wartime) MAGTF, approximately 20,000 to 90,000 personnel. The MEF is the principal Marine Corps war fighting organization. It is capable of missions across the range of military operations, through amphibious assault and sustained operations ashore in any environment. Commanded by a Lieutenant General or Major General
- (2) Three Standing MEFs- Each MEF is comprised of a Command Element, Marine Division, Marine Aircraft Wing and a Marine Logistics Group.

(a) I Marine Expeditionary Force (I MEF)

1. 1<sup>st</sup> Marine Division (1<sup>st</sup> MARDIV)- Camp Pendleton, CA
2. 3<sup>rd</sup> Marine Aircraft Wing (3<sup>rd</sup> MAW)- Miramar, CA
3. 1<sup>st</sup> Marine Logistics Group (1<sup>st</sup> MLG)- Camp Pendleton, CA

(b) II Marine Expeditionary Force (II MEF)

1. 2<sup>nd</sup> Marine Division (2<sup>nd</sup> MARDIV)- Camp Lejeune, NC
2. 2<sup>nd</sup> Marine Airwing (2<sup>nd</sup> MAW)- Cherry Point, NC
3. 2<sup>nd</sup> Marine Logistics Group (2<sup>nd</sup> MLG)- Camp Lejeune, NC

(c) III Marine Expeditionary Force (III MEF)

1. 3<sup>rd</sup> Marine Division (3<sup>rd</sup> MARDIV)- Camp Butler, Okinawa, Japan
2. 1<sup>st</sup> Marine Aircraft Wing (1<sup>st</sup> MAW)- Futenma, Okinawa, Japan
3. 3<sup>rd</sup> Marine Logistics Group (3<sup>rd</sup> MLG)- Camp Butler, Okinawa, Japan.

b. Marine Expeditionary Brigade (MEB) (see appendix 1, figure 8)

(1) Definition of Capabilities - This is a medium sized, approximately 3,000 to 20,000 personnel, infantry reinforced, non- standing MAGTF that is task organized to respond to a full range of crisis, from forcible entry to humanitarian assistance. MEB's are not a standing force and formed only in times of need. An example is post 9/11, the 4<sup>th</sup> MEB and 2<sup>nd</sup> MEB were formed to respond to combat and peacekeeping contingencies in Afghanistan and Iraq. The MEB is commanded by a Brigadier General.

(2) MEB is comprised of a Command Element, Marine Regiment, Marine Aircraft Group and Combat Logistics Regiment.

(a) 1<sup>st</sup> Marine Expeditionary Brigade (1<sup>st</sup> MEB)- Camp Pendleton, CA

(b) 2<sup>nd</sup> Marine Expeditionary Brigade (2<sup>nd</sup> MEB)- Camp Lejeune, NC

(c) 3<sup>rd</sup> Marine Expeditionary Brigade (3<sup>rd</sup> MEB)- Camp Butler, Okinawa, Japan

c. Marine Expeditionary Unit, Special Operations Capable (MEU/SOC) (see appendix 1, figure 9)

(1) Definition of Capabilities - The standard forward deployed Marine expeditionary organization. MEU (SOC) is task organized to be a forward deployed presence and designed to be the "First on the scene" force. MEU (SOC) is capable of a wide range of small scale contingencies to include non-combatant evacuation, clandestine recovery, maritime interdictions, specialized demolitions, tactical recovery of aircraft and/or personnel, gas/oil platform seizure, humanitarian/civic actions, and other military operations other than war. Approximately 1,500 to 3,000 personnel and commanded by a Colonel.

(2) MEU is comprised of a Command Element, Marine Infantry Battalion, Composite Marine Air Squadrons (fixed and rotary wing) and Combat Logistics Battalion.

(a) 11<sup>th</sup>, 13<sup>th</sup> and 15<sup>th</sup> Marine Expeditionary Units- Camp Pendleton, CA

(b) 22<sup>nd</sup>, 24<sup>th</sup> and 26<sup>th</sup> Marine Expeditionary Units- Camp Lejeune, NC

(c) 31<sup>st</sup> Marine Expeditionary Unit- Camp Hansen, Okinawa, Japan

c. Special Purpose Marine Air-Ground Task Force (SPMAGTF)

(1) Definition of Capabilities - The SPMAGTF is a non-standing MAGTF temporarily formed to conduct a specific mission. It is normally formed when a standing MAGTF is unavailable or inappropriate. Their designation derives from the mission they are assigned, the location in which they will operate, or the name of the operation in which they will participate.(i.e. SPMAGTF Somalia, Hurricane Katrina etc....)

(2) SPMAGTF is comprised of Command Element and Composites of MARDIV, MAW and MLG.

#### **4. FUNCTIONAL AREAS OF OPERATION WITHIN MAGTF ELEMENTS**

The functional areas within MAGTF elements are balanced and structured to accomplish a specific mission. The functional areas provide support via administrative, intelligence, operational, logistical and communicative. Functional areas fall under Headquarters and Service of these prospective elements.

a. Marine Division, Marine Aircraft Wing and Marine Logistics Group)

(see appendix 1, figure 10)

(1) G-1 Administration (Manpower, Records, Legal)

(2) G-2 Intelligence ( Security)

(3) G-3 Operations (Training)

(4) G-4 Logistics (Supply)

(5) G-6 Communications (Computers, Radios)

b. Marine Regiment, Marine Aircraft Group and Combat Logistics Regiment  
Marine Battalion, Marine Air Squadron, and Combat Logistics Regiment

(see appendix 1, figure 11)

- (1) S-1 Administration ( Manpower, Records, Legal)
- (2) S-2 Intelligence (Security)
- (3) S-3 Operations ( Training)
- (4) S-4 Logistics (Logistics)
- (5) S-6 Communications (Computers, Radios)

**REFERENCES:**

MCRP 5-12D, Organization of Marine Corps Forces

**UNITED STATES MARINE CORPS  
Field Medical Training Battalion  
Camp Pendleton**

**FMSO 1104**

**Ethical Leadership**

**TERMINAL LEARNING OBJECTIVES**

1. In a military environment, **identify the leadership traits and principles of the Marine Corps**, per the references. (FMSO-HSS-1104)

**ENABLING LEARNING OBJECTIVES**

1. Without the aid of reference, given a description or title, **identify the Marine Corps Leadership Traits**, within 80 percent accuracy, per MCWP 6-11, Leading Marines. (FMSO-HSS-1104a)
2. Without the aid of reference, given a description or title, **identify the Marine Corps Leadership Principles**, within 80 percent accuracy, per MCWP 6-11, Leading Marines. (FMSO-HSS-1104b)
3. Without the aid of reference, given a description or list, **identify ethical behavior**, within 80 percent accuracy, per MCWP 6-11, Leading Marines. (FMSO-HSS-1104c)
4. Without the aid of reference, given a description or list, **identify the Marine Corps Core Values**, within 80 percent accuracy, per MCWP 6-11, Leading Marines. (FMSO-HSS-1104d)
5. With the aid of reference, given a case study/scenario, **participate in a classroom discussion applying the principles of ethical leadership**, per Ethics for the Junior Officer. (FMSO-HSS-1104e)

## **INTRODUCTION**

“Being a Marine is a state of mind. It is an experience some have likened more to a calling than a profession. Being a Marine is not a job—not a pay check; it is not an occupational specialty. It is not male or female, majority or minority; nor is it a rank insignia. Stars, bars, or chevrons are only indicators of the responsibility or authority we hold at a given time. Rather, being a Marine comes from the eagle, globe, and anchor that is tattooed on the soul of every one of us who wears the Marine Corps uniform. It is a searing mark in our innermost being which comes after the rite of passage through boot camp or Officer Candidates School when a young man or woman is allowed for the first time to say, "I'm a United States Marine." And unlike physical or psychological scars, which, over time, tend to heal and fade in intensity, the eagle, globe, and anchor only grow more defined—more intense—the longer you are a Marine. "Once a Marine, always a Marine." "Among Marines there is a fierce loyalty to the Corps that persists long after the uniform is in mothballs. . . . Woven through that sense of belonging, like a steel thread, is an elitist spirit. Marines are convinced that, being few in number, they are selective, better, and, above all, different."

### 1. **LEADERSHIP TRAITS**

The traits and principles of leadership are the basic fundamentals that Marines use to develop their own leadership abilities and that of their subordinates. The 14 leadership traits are:

Justice, Judgment, Dependability, Initiative, Decisiveness, Tact, Integrity, Enthusiasm, Bearing, Unselfishness, Courage, Knowledge, Loyalty, and Endurance. (See definitions for each testable term in glossary.)

While these may be simple words to define, they are at times difficult to live up to and enforce. Rank does not confer privileges, it entails responsibilities. Subordinates under your direction will place you on a special pedestal of trust and confidence, as will most of the American public. As military leaders, you need to consistently display the match between your behaviors and the above traits. There can be no compromising on this issue in a profession where the ultimate thing you can demand of people is that they lay their life on the line in the execution of your orders.

When all is said and done, leadership must have a moral base, a set of ethical values, to keep us true to the high ideas of our forebears who provided us with the cherished inheritance of freedom. The integrity of an officer's word, signature, commitment to truth, and what is right must be natural, involved, and rise to the forefront of any decision or issue. There is sometimes a misconception by a few that to win in combat requires throwing all the rules away; “anything goes”. This false belief leads some to believe their work is outside the norms and rules of society. Nothing could be further from the truth. Adherence to rules is extremely important to military good order and discipline as well as the execution of tactics in the heat of battle. Some rules are deviated from and even broken that involve ethics or actions that are wrong under the rules of international warfare, accountability is held based on what was expected and right under the circumstances.

## 2. **LEADERSHIP PRINCIPLES**

### **Know Yourself and Seek Self Improvement**

This principle of leadership should be developed by the use of leadership traits. Evaluate yourself by using the leadership traits and determine your strengths and weaknesses.

You can improve yourself in many ways. To develop the techniques of this principle, you must:

- Make an honest evaluation of yourself to determine your strong and weak personal qualities.
- Seek the honest opinions of your friends or superiors.
- Learn by studying the causes for the success and failures of others.
- Develop a genuine interest in people.
- Master the art of effective writing and speech.
- Have a definite plan to achieve your goal.

### **Be Technically and Tactically Proficient**

You must know your job thoroughly and possess a wide field of knowledge. Before you can lead, you must be able to do the job. Tactical and technical competence can be learned from books and from on the job training. To develop this leadership principle, you should:

- Know what is expected of you then expend time and energy on becoming proficient at those things.
- Form an attitude early on of seeking to learn more than is necessary.
- Observe and study the actions of capable leaders.
- Spend time with those people who are recognized as technically and tactically proficient at those things.
- Prepare yourself for the job of the leader at the next higher rank.
- Seek feedback from superiors, peers and subordinates.

### **Know Your People and Look Out for their Welfare**

This is one of the most important leadership principles. A leader must make a conscientious effort to observe his Marines/Sailors and how they react to different situations. A Marine/Sailor who is nervous and lacks self-confidence should never be put in a situation where an important decision must be made. This knowledge will enable you, as the leader, to determine when close supervision is required.

To put this principle in to practice successfully, you should:

- Put your Marines'/Sailors' welfare before your own.
- Be approachable.
- Encourage individual development.
- Know your unit's mental attitude; keep in touch with their thoughts.
- Ensure fair and equal distribution of rewards.
- Provide sufficient recreational time and insist on participation.

### **Keep Your Personnel Informed**

Marines and Sailors, by nature, are inquisitive. To promote efficiency and morale, a leader should inform the Marines/Sailors in their unit of all happenings, and give reasons why things are to be done. This is accomplished only if time and security permit.

Informing your Marines/Sailors of the situation makes them feel they are a part of the team, and not just a cog in a wheel. Informed Marines/Sailors perform better.

Techniques to apply this principle are:

- Whenever possible, explain why tasks must be done and the plan to accomplish them.
- Be alert to detect the spread of rumors. Stop rumors by replacing them with the truth.
- Build morale and esprit de corps by publicizing information concerning successes of your unit.
- Keep your unit informed about current legislation and regulations affecting their pay, promotion, privileges, and other benefits.

### **Set the Example**

A leader who shows professional competence, courage and integrity sets high personal standards for himself before he can rightfully demand it from others. Your appearance, attitude, physical fitness and personal example are all on display daily for the Marines and Sailors in your unit. Remember, your Marines and Sailors reflect your image!

Techniques for setting the example are to:

- Show your subordinates you are willing to do the same things you ask of them.
- Maintain an optimistic outlook.
- Conduct yourself so that your personal habits are not open to criticism.
- Avoid showing favoritism to any subordinate.
- Delegate authority and avoid over supervision, in order to develop leadership among subordinates.

### **Ensure the Task is Understood, Supervised, and Accomplished**

Leaders must give clear, concise orders that cannot be misunderstood, and then by close supervision, ensure these orders are properly executed. Before you can expect your men to perform, they must know what is expected of them.

The most important part of this principle is the accomplishment of the mission. In order to develop this principle you should:

- Issue every order as if it were your own.
- Use the established chain of command.
- Encourage subordinates to ask questions concerning any point in your orders or directives they do not understand.
- Question subordinates to determine if there is any doubt or misunderstanding in regard to the task to be accomplished.
- Supervise the execution of your orders.
- Exercise care and thought in supervision; over supervision will hurt initiative and create resentment, while under supervision will not get the job done.

### **Train Your Marines and Sailors as a Team**

Teamwork is the key to successful operations. Teamwork is essential from the smallest unit to the entire Marine Corps. As a leader, you must insist on teamwork from your Marines and Sailors. Train, play, and operate as a team. Be sure each Marine/Sailor knows their position and responsibilities within the team framework.

To develop the techniques of this principle you should:

- Stay sharp by continuously studying and training.
- Encourage unit participation in recreational and military events.
- Do not publicly blame an individual for the team's failure or praise just an individual for the team's success.
- Ensure training is meaningful and the purpose is clear to all members of the command.
- Train your team based on realistic conditions.
- Insist every person understands the functions of the other members of the team and the function of the team as part of the unit.

### **Make Sound and Timely Decisions**

The leader must be able to rapidly estimate a situation and make a sound decision based on that estimation. Hesitation or a reluctance to make a decision leads subordinates to lose confidence in your abilities as a leader. Loss of confidence in turn creates confusion and hesitation within the unit.

Techniques to develop this principle include:

- Develop a logical and orderly thought process by practicing objective estimates of the situation.
- When time and situation permit, plan for every possible event that can reasonably be foreseen.
- Consider the advice and suggestions of your subordinates before making decisions.
- Consider the effects of your decisions on all members of your unit

### **Develop a Sense of Responsibility Among Your Subordinates**

Another way to show your Marines/Sailors you are interested in their welfare is to give them the opportunity for professional development. Assigning tasks and delegating authority promotes mutual confidence and respect between leader and subordinates. It also encourages subordinates to exercise initiative and to give wholehearted cooperation in accomplishment of unit tasks. When you properly delegate authority, you demonstrate faith in your Marines/Sailors, increase authority, and increase their desire for greater responsibilities.

To develop this principle you should:

- Operate through the chain of command.
- Provide clear, well thought out directions.
- Give your subordinates frequent opportunities to perform duties normally performed by senior personnel.
- Be quick to recognize your subordinates' accomplishments when they demonstrate initiative and resourcefulness.
- Correct errors in judgment and initiative in a way which will encourage the individual to try harder.
- Give advice and assistance freely when your subordinates request it.
- Resist the urge to micro-manage.
- Be prompt and fair in backing subordinates.

### **Employ Your Command Within Its Capabilities**

A leader must have a thorough knowledge of the tactical and technical capabilities of the command. Successful completion of a task depends upon how well you know your units capabilities. If the task assigned is one that your unit has not been trained to do, failure is very likely to occur. Failures lower your unit's morale and self esteem. Seek out challenging tasks for your unit, but be sure that your unit is prepared for and has the ability to successfully complete the mission.

Techniques for development of this principle are to:

- Avoid volunteering your unit for tasks that are beyond their capabilities.
- Be sure that tasks assigned to subordinates are reasonable.
- Assign tasks equally among your subordinates.
- Use the full capabilities of your unit before requesting assistance.

### **Seek Responsibilities and Take Responsibility**

For professional development, you must actively seek out challenging assignments. You must use initiative and sound judgment when trying to accomplish jobs that are required by your grade. Seeking responsibilities also means that you take responsibility for your actions. Regardless of the actions of your subordinates, the responsibility for decisions and their application falls on you.

Techniques in developing this principle are to:

- Learn the duties of your immediate senior, and be prepared to accept the responsibilities of these duties.
- Seek a variety of leadership positions that will give you experience in accepting responsibility in different fields.
- Take every opportunity that offers increased responsibility.
- Perform every task, no matter whether it is top secret or seemingly trivial, to the best of your ability.
- Stand up for what you think is right. Have courage in your convictions.
- Carefully evaluate a subordinate's failure before taking action against that subordinate.
- In the absence of orders, take the initiative to perform the actions you believe your senior would direct you to perform if present.

## **3. ETHICAL BEHAVIOR**

The decisions we make must pass the test of ethical behavior. Ethical behavior is action taken specifically in observance of a defined standard of conduct. Ethics are the standards of the Marine Corps. They set forth general guidelines about what we ought to do. As a result, the individual is obligated to apply judgment to a given set of circumstances. Judgment, and therefore choice, is at the center of ethical conduct. Ethical choices often involve a moral dilemma: the necessity to choose between competing obligations in circumstances that prevent one from doing both. Action is at the heart of ethical behavior. An academic understanding of what is right and wrong is irrelevant unless it is coupled to appropriate action. Even then, the answer is not always clear. Ethical decision-making occurs every time a Marine/Sailor is faced with a need to decide—now—what to do. It may be a cut-and-dry decision in garrison or it may be one on the battlefield that is far more ambiguous. At the

heart of the leader's ability to choose correctly is a firm grounding in both institutional and individual values that will point the correct direction.

It is neither possible to hand down a set of rules that will not answer every question, nor is it possible to publish a code that will satisfy every demand. What is possible is the establishment of a simple test: "If you are prepared to talk about your actions, or lack thereof, in front of a national audience, made up of all your seniors, peers, subordinates, and friends who share the same professional values, and whose opinions you value, then your behavior was, or is, probably ethical in nature." While the test itself is straightforward, the answers are not. Giving the right answers, and more importantly, doing the right things, requires courage.

#### 4. **CORE VALUES**

Honor - the bedrock of Marine Corps character. The quality that guides Marines to exemplify the ultimate in ethical and moral behavior; never to lie, cheat, or steal; to abide by an uncompromising code of integrity; to respect human dignity; to have respect and concern for each other. The quality of maturity, dedication, trust, and dependability that commits Marines to act responsibly; to be accountable for actions; to fulfill obligations; and to hold others accountable for their actions.

Courage - the heart of Marine Corps core values, courage is the mental, moral, and physical strength ingrained in Marines to carry them through the challenges of combat and the mastery of fear; to do what is right; to adhere to a higher standard of personal conduct; to lead by example, and to make tough decisions under stress and pressure. It is the inner strength that enables a Marine to take that extra step.

Commitment - the spirit of determination and dedication within members of a force of arms that leads to professionalism and mastery of the art of war. It leads to the highest order of discipline for unit and self. It is the ingredient that enables 24-hour-a-day dedication to Corps and Country. It is an unrelenting determination to achieve a standard of excellence in every endeavor and concern for others. Commitment is the value that establishes the Marine as the warrior and citizen others strive to emulate.

Reaffirm these core values and ensure they guide your performance, behavior, and conduct every minute of every day.

## Scenario #1

You are an O-5 Commanding Officer of an aircraft squadron embarked on a carrier off the coast of a nation that has illegally imprisoned Americans. Word comes down from the task force commander that your unit will fly cover for a rescue mission to start in 48 hours, and your report to area command, indicating your unit's readiness, must be filed within two hours via the chain of command.

In reviewing aircraft status reports you ascertain that all requisitioned repair parts have not been received, and some of those that are missing are critical for meeting the missions readiness required for the task. The ship's supply officer determines the parts won't be delivered for at least 72 hours.

You send your report stating your unit will not be fully ready because of delayed parts. Within minutes you receive a call, over a secure circuit, telling you to revise your report to say your aircraft are ready. As the task force commander explains, a few aircraft one way or the other will not have a significant effect on the mission.

You refuse to change your report, but within the hour you find out that your report was changed, over your signature, saying that your unit will be ready to fly, and the report was sent on to area headquarters. You know for a fact the area commander personally selected your admiral to command the task force, and by his past words has shown great confidence in this person.

What do you do?

## Scenario #2

A newly reporting officer was selected to be a flag aide while still awaiting quarters assignment. Knowing the position would require long hours and occasional separation from family, the aide mentioned to the housing officer the couple was living in an expensive rented home off base while awaiting quarters assignment.

While the matter was under consideration, the officer assumed the responsibilities of aide to the flag and quickly became known throughout the command as an effective, efficient, and influential officer.

The housing officer recognized the importance and influence of the aide's position. In looking over the waiting list for quarters assignment, it was determined that the aide would have to wait six months before quarters would become available.

In trying to decide what to do to help the aide, the housing officer thought about the inconvenience and possible risk with leaving the aide in civilian quarters. At times, for example, the spouse might be left alone at night. Further recognizing the aide had to be on call around the clock, and thus should live on base, the housing officer moved the aide to the top of the waiting list so the couple could move in right away.

The aide thanked the housing officer and, as a result of having on-base housing was even more efficient in providing assistance to the flag officer. The flag was also appreciative of the courtesy shown to the aide and commented to the housing officer after learning that the aide was now on base.

This seems to be a fairly straightforward case of recognizing the needs of the service and helping a fellow officer do a better job, right?

What would/should you do if you are the flag aide?

What would/should you do if you are the flag officer?

What would/should you do if you are the housing officer?



**UNITED STATES MARINE CORPS  
Field Medical Training Battalion  
Camp Pendleton**

**FMSO 1105**

**USMC Utility Uniform and Individual Combat Equipment**

**TERMINAL LEARNING OBJECTIVES**

1. Given the required clothing, **wear the USMC utility uniform**, per the references. (FMSO-HSS-1105)
2. Given individual combat equipment and cleaning materials, **maintain combat equipment**, per the references. (FMSO-FP-1106)
3. Given individual combat equipment, **wear individual combat equipment for tactical operations**, to support mission requirements, per the reference. (FMSO-FP-1203)

**ENABLING LEARNING OBJECTIVES**

1. Without the aid of references, given a description or list, **identify the proper wear of the Marine Corps Combat Utility Uniform (MCCUU)**, within 80 percent accuracy, per MCO P1020.34 (Marine Corps Uniform Regulations). (FMSO-FP-1105a)
2. Without the aid of references, given a description or list, **identify the proper care of the Marine Corps Combat Utility Uniform (MCCUU)**, within 80 percent accuracy, per MCO P1020.34 (Marine Corps Uniform Regulations). (FMSO-FP-1105b)
3. Without the aid of references, given a description or list, **identify the proper grooming standards for members of the Marine Corps**, within 80 percent accuracy, per MCO P1020.34 (Marine Corps Uniform Regulations). (FMSO-FP-1105c)
4. Without the aid of references, given a description or list, **identify the components of the Individual Combat Equipment**, within 80 percent accuracy, per FM-21-15, Care and Use of Individual Clothing and Equipment. (FMSO-HSS-1106a)
5. Without the aid of references, given a description or list, **identify the proper care and maintenance of the Individual Combat Equipment**, within 80 percent accuracy, per FM-21-15, Care and Use of Individual Clothing and Equipment. (FMSO-FP-1106b)
6. Without the aid of references, given individual combat gear, **describe the proper wearing of Individual Combat Equipment**, within 80 percent accuracy, per FM-21-15, Care and Use of Individual Clothing and Equipment. (FMSO-HSS-1203a)

## **INTRODUCTION**

Navy enlisted personnel assigned to Marine Corps units are issued the Marine Corps Combat Utility Uniform (MCCUU). They are also given a yearly uniform allowance for general upkeep and maintenance which is their responsibility. Officers, on the other hand, are expected to purchase their own uniforms.

The Marine Corps prides itself with exceptional adherence to uniform standards. Marines are expected to always present a sharp, well maintained, and squared away image. That being said, all Navy personnel assigned to Marine units are expected to present the same image. Wearing of the utility uniform requires complete compliance with Marine Corps uniform regulations.

**Items Issued** - standard issue to Navy enlisted personnel serving with Marine Corps units include:

Infantry combat boots	1 pair
Hot weather boots	1 pair
Utility cover (without Marine emblem)	1 Woodland 1 Desert
Booney/field cover	1 Woodland 1 Desert
Combat utility blouse	2 Woodland 2 Desert
Combat utility trousers	2 Woodland 2 Desert
Cushion sole socks	6 pairs
HM/RP collar insignia	2
Name tapes	4 sets each
Sweat shirt	1
Sweat pants	1
Web belt	1
Belt buckle	1
Glowbelt	1
Shorts (green)	1
Sweater	1
Green undershirt	6 (3 cotton and 3 synthetic)

### **1. PROPER WEAR OF THE MCCUU**

**Design** - the utility uniform is designed for field wear and should be loose-fitting and comfortable. The size selected should fit loosely to allow for some shrinkage without rendering the garment unusable.

**Blouse** - the utility blouse will not be tucked into the trousers. The woodland uniform will be worn in the winter with sleeves down. The desert uniform will be worn in the summer months with sleeves rolled up. When sleeves are worn “up” they will have a three inch fold terminating about two inches above the elbow. The utility blouse should always be kept buttoned. Large or heavy objects should not be carried in the pockets.

**Trousers** - when combat boots are worn, the trousers will be bloused in a neat and uniform manner. In garrison, the cargo pockets on the trousers will not be used.

**Cover** - enlisted personnel, E-4 to E-9, will wear a subdued (black) cover device. Officers will wear a subdued officer’s crest on their cover. Navy personnel are to use the cover

without the embroidered Marine Corps emblem. If unable to obtain a cover without the eagle, globe, and anchor, nothing will be placed over it.

**Belt** - all personnel will wear the tan khaki web belt or a Marine Corps Martial Arts Belt. The Marine Corps Martial Arts Program (MCMAP) has a designated belt ranking system. Only those individuals who attend the MCMAP course and qualify are authorized to wear the appropriate belt.

**Sweater** - Navy officer and enlisted personnel may wear the green (Wooley Pulley) with the combat utility uniform. The sweater will be worn underneath the utility blouse with sleeves down.

**Raingear** - Navy personnel will wear organizational rainwear as issued by the Marine Corps with the combat utility uniform.

### **Collar Devices**

The **corps device** is worn on the left collar parallel to the deck (not the collar) for paygrades O1 – O6 and 1 inch from the bottom edge of the collar (see figure 1), equally spaced from left to right.



**Figure 1. Corps device on left collar**

The **rank device** is worn on the right collar, for officers in paygrade O1-O5, it is worn parallel to the deck (not the collar) and 1 inch from the bottom edge of the collar (see figure 2), equally spaced from left to right. Officers in paygrade O6 and above will wear their collar device perpendicular to the deck (see figure 3). Officers will wear subdued collar devices while deployed and shiny devices while in garrison.



**Figure 2. Rank device placement for O1-O5**



**Figure 3. Rank device placement for O6 and above**

The bottom edge of the **warfare device** will be centered over the left pocket on a horizontal line (parallel to the ground), even with the highest point of the service tape. If a second device is authorized, it will be worn 1/8 inch above the first device (see figure 4).



**Figure 4. Warfare device**

## **Unauthorized Wear of the MCCUU**

The wearing of the MCCUU and its policies are much like the Navy's utility uniform (dungarees). Members are *prohibited* from wearing the utility uniform off base with the following exceptions:

- To and from work while in a vehicle
- During medical emergencies
- Circumstances that are beyond your control (vehicle breakdown)
- While visiting drive-thrus that do not require you to exit the vehicle

## 2. **CARE OF THE MCCUU**

The MCCUU is designed for easy care. These uniforms are designed as a wash-and-wear uniform. If needed, a hand iron on a low heat setting may be used. The use of starch, sizing and any process that involves dry cleaning or a steam press will adversely affect the treatments and durability of the uniform and is NOT recommended.

### **Marking of the MCCUU**

The uniform will be plainly and indelibly marked with the owner's name (except for organizational clothing). The Marine Corps has designated specific locations for the marking of uniform items. The exact size, color of ink, and specific location of each uniform article can be found in Chapter 10 of the Marine Corps Uniform Regulations, MCO P1020.34 (<http://www.tecom.usmc.mil/mcub/library/MCUR/URTOC.htm>).

## 3. **GROOMING STANDARDS/PERSONAL APPEARANCE**

Members will present the best possible image at all times and continue to set the example while in and out of uniform. Members are prohibited from:

- Mutilation of the body or any body parts in any manner.
- Attaching, affixing or displaying objects, articles, jewelry, or ornamentation to, through or under skin, tongue, or any other body part. Female members may not wear earrings in combat utility uniform.
- Tattoos or brands on the neck and head. On other areas of the body, tattoos or brands that are prejudicial to good order, discipline and morale or are of a nature to bring discredit upon the Marine Corps are also prohibited. Sleeve tattoos are likewise prohibited. A sleeve tattoo is a very large tattoo, or a collection of smaller tattoos, that covers or almost covers a person's entire arm or leg. Half-sleeve or quarter-sleeve tattoos that are visible to the eye when wearing standard PT gear (t-shirt and shorts) are likewise prohibited. A half-sleeve or quarter-sleeve tattoo is defined as a very large tattoo, or a collection of smaller tattoos that covers, or almost covers, the entire portion of an arm or leg above or below the elbow or knee. Tattoos or brands that are prejudicial to good order, discipline and morale, or are of a nature to bring discredit upon the Marine Corps are also prohibited. Prejudicial to good order, discipline and morale, or are of a nature to bring discredit upon the Marine Corps may include, but are not limited to, any tattoo that is sexist, racist, vulgar, anti-American, anti-social, gang related, or extremist group or organization related.

- Having eccentric or faddish styles of hair, jewelry, or eyeglasses. The good judgment of all members at all levels is key to enforcement of Marine Corps standards with this issue.
- Chewing gum, chewing tobacco, cigarettes, or the consumption of food while in formation or walking in uniform.
- Articles that are not authorized for wear as a part of a regulation uniform will not be worn with the uniform such as: pens, watch chains, backpacks/bags (over the shoulder), CD/MP3 players or other similar items.
- For females, barrettes, combs, rubber bands, etc. are authorized, if concealed by the hair.
- Cellular phones (personally owned and organizationally issued) and other electronic equipment will not be worn exposed on Marine Corps uniforms.
- Sunglasses will be conservative in nature and will not be worn indoors or in formations unless authorized by a medical representative.
- The wearing of clothing articles not specifically designed to be normally worn as headgear (e.g., bandanas, doo rags) is strictly prohibited in civilian attire and while in uniform.
- No part of a prescribed uniform, except those items not exclusively military in character, will be worn with civilian clothing.

#### 4. **INDIVIDUAL COMBAT EQUIPMENT**

Improved Load Bearing Equipment (ILBE) (see figure 5) - the ILBE is a load carrying system designed to provide a durable and lightweight means for the deployed Marine/Sailor to transport their individual combat clothing and equipment. It is an integrated load bearing system that is light, durable and can easily be configured for the mission at hand and to maximize the mobility, survivability and lethality of the Marine/Sailor in combat environments.



**Figure 5. ILBE Sideview**

Fighting Load Vest (to include belt) - the vest is designed to reduce heat build up on the back with minimum area of coverage with the H-Harness design. The wide shoulder straps of the vest help distribute the load without the need for excessive padding that can hinder mobility and sighting a weapon.

Corpsman Configuration - will receive four zippered medical pockets, the vest and two double 30 round magazine pockets. In addition to the configuration worn, the individual will also receive two single 30 round magazine pockets and two fragmentation grenade pockets.

Sleep System Carrier - designed to carry the sleeping system.

Patrol Pack - utilized to sustain an individual for 24-48 hour period. It is also known as the day pack.

Sustainment Pockets - attached to outside of the pack as needed for additional load capability.

Butt Pack - holds extra gear such as socks, one MRE, foot powder, and note taking gear, and may be worn separately.

Hydration Bladder - used to drink on the move.

Repair Kit - utilized to repair the equipment as needed.

Additional Pockets - pockets can be added and removed as mission requires.

### **Additional Equipment**

#### Small Arms Ammunition Cases

M16/M4 Rifle Case - holds two magazines of 30 rounds.

M9 Service Pistol Case - holds one magazine of 15 rounds.

Canteen Cover - used to carry the plastic water canteens and metal cup. The covers have two small pockets attached for carrying water purification tablets.

Flak Jacket - designed to be worn as a jacket to stop shrapnel, it is not bullet proof.

Helmet with Cover - it is designed to be worn on the head by the individual to stop shrapnel; it is not bullet proof.

ISO Mat - a foam padding used to support the sleeping system.

## **5. CLEANING AND MAINTENANCE OF INDIVIDUAL COMBAT EQUIPMENT**

- Scrape dirt and dust from the item using a brush that will not cut the fabric.
- Hose or wash the item in a pail of water. Rinse thoroughly with clean water.
- Do not use chlorine bleach, yellow soap, cleaning fluids, or solvents that will discolor or deteriorate the item.
- Dry item in the shade or indoors. Do not dry in direct sunlight, direct heat, or open flame.
- Do not launder or dry item in home or commercial washers and dryers. Do not attempt to dye or repair. Turn in for repair or replacement.
- Remember, extremely dirty or damaged equipment can eventually fail to perform its intended function. Clean it or turn it in for repair or replacement.

REV: Sep 2008

**UNITED STATES MARINE CORPS  
Field Medical Training Battalion  
Camp Pendleton**

**FMSO 1301**

**Provide Support for Marine Corps Operational Planning**

**TERMINAL LEARNING OBJECTIVE**

1. Given the requirement, commanding officer's intent, and the reference, **be introduced to Marine Corps operational planning**, to support mission requirements per the references. (FMSO-PLAN-1301)

**ENABLING LEARNING OBJECTIVE**

1. With the aid of references, given a description, list or scenario, **be introduced to the Marine Corps Planning Process (MCPP)**, per the student handout. (FMSO-PLAN-1301a)
2. With the aid of references, given a description, list or scenario, **be introduced to the Annex Q**, per the student handout. (FMSO-PLAN-1301b)

*“Planning involves projecting our thoughts forward in time and space to influence events before they occur rather than merely responding to events as they occur. This means contemplating and evaluating potential decisions and actions in advance.”*

—MCDP 5, *Planning*

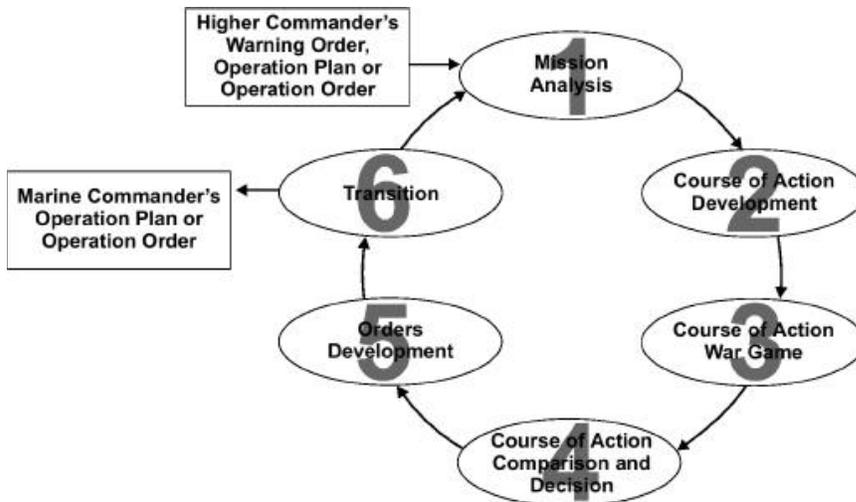
## **1. THE MARINE CORPS PLANNING PROCESS**

The Marine Corps Planning Process (MCP) supports the Marine Corps war fighting philosophy of maneuver warfare. Since planning is an essential and significant part of command and control (C2), the MCP recognizes the commander’s central role as the decision maker. It helps organize the thought processes of a commander and his staff throughout the planning and execution of military operations. The MCP focuses on the mission and the threat. It capitalizes on the principle of unity of effort and supports the establishment and maintenance of tempo. The MCP is applicable across the range of military operations and is designed for use at any echelon of command. The process can be as detailed or as abbreviated as time, staff resources, experience, and the situation permit. Planning is the act of envisioning and determining effective ways of achieving a desired end state. It supports the Commander in making decisions in a time-constrained and uncertain environment. Whether planning is performed at the strategic, operational, or tactical level, its key functions, as identified in MCDP 5-1, *Planning*, are to:

- Direct and coordinate actions
- Develop a shared situational awareness
- Generate expectations about how actions will evolve and how they will affect the desired outcome
- Support the exercise of initiative
- Shape the thinking of planners

Since planning is future-oriented, and the future is uncertain, all planning is based on imperfect knowledge and involves assumptions. To understand how planning applies to the medical services of an operation, the process needs to be explained.

The MCP establishes procedures for analyzing a mission, developing and war gaming courses of action (COAs) against the threat, comparing friendly COAs against the Commander’s criteria and each other, selecting a COA, preparing an operation order or operation plan (OPLAN) for execution, and transitioning the order or plan to those tasked with its execution. The MCP organizes these procedures into six manageable, logical steps (see figure 1). These steps provide the Commander and his staff, at all levels, a means to organize their planning activities, to transmit plans to subordinates and subordinate commands, and to share a common understanding of the mission and Commander’s intent.



**Figure 1. Marine Corps Planning Process**

### **Mission Analysis**

Mission analysis is the first step in planning, and it drives the MCPP. Its purpose is to review and analyze orders, guidance, and other information provided by higher headquarters and to produce a unit mission statement.

### **Course of Action Development**

During COA development, planners use the mission statement (which includes the higher headquarters Commander's tasking and intent), Commander's intent, and Commander's planning guidance to develop COAs. Each prospective COA is examined to ensure that it is suitable, feasible, acceptable, distinguishable, and complete with respect to the current and anticipated situation, the mission, and the Commander's intent.

### **Course of Action War Gaming**

COA of action war gaming involves a detailed assessment of each COA as it pertains to the enemy and the battle space. Each friendly COA is war gamed against selected threat COAs. COA war gaming assists planners in identifying strengths and weaknesses, associated risks, and asset shortfalls for each friendly COA. COA war gaming also identifies branches and potential sequels that may require additional planning. Short of actually executing the COA, COA war gaming provides the most reliable basis for understanding and improving each COA.

### **Course of Action Comparison and Decision**

In COA comparison and decision, the Commander evaluates all friendly COAs against established criteria, and then evaluates them against each other. The Commander then selects the COA that will best accomplish the mission.

### **Orders Development**

During orders development, the staff uses the Commander's COA decision, mission statement, and Commander's intent and guidance to develop orders that direct unit actions. Orders serve as the principal means by which the Commander expresses his decision, intent, and guidance.

## **Transition**

Transition is an orderly handover of a plan or order as it is passed to those tasked with execution of the operation. It provides those who will execute the plan or order with the situational awareness and rationale for key decisions necessary to ensure there is a coherent shift from planning to execution.

## **2. PRINCIPLES OF HEALTH SERVICE SUPPORT**

*Conformity* - Conformity with the tactical plan is the most fundamental element for effectively providing Health Service Support (HSS). Only by participating in the development of the OPLAN can the HSS planner ensure adequate HSS on the battlefield at the right time and place.

*Continuity* - HSS must be continuous since the interruption of treatment may cause an increase in morbidity and mortality. Procedures are standardized at each organizational level to ensure that all required medical treatment at that echelon is accomplished. *No patient is evacuated any farther to the rear than his physical condition or the operational situation requires.*

*Control* - Control of HSS resources must rest with the medical commander. Combat health support staff officers must be proactive and keep their Commanders apprised of the impact of future operations on HSS assets. The HSS system must be responsive to a rapidly changing battlefield and must support the tactical plan in an effective manner. The medical commander must be able to tailor medical organizations and direct them to focal points of demand throughout his area of operation (AO). For this reason, HSS units normally maintain unit integrity for C2. Treatment performed at each echelon of the HSS system must be commensurate with available HSS resources. Since these resources are limited, it is essential that their control be retained at the highest HSS echelon consistent with the tactical situation.

*Proximity* - The location of HSS assets in support of combat operations is dictated by the tactical situation (mission, enemy, terrain, troops, time available and civilian considerations) factors, the time and distance factor, and the availability of evacuation resources. The speed with which medical treatment is initiated is extremely important in reducing morbidity and mortality. Medical evacuation time must be minimized by the efficient allocation of resources and the judicious location of a Medical Treatment Facility (MTF). The MTF cannot be located so far forward that it interferes with the conduct of combat operations or is subjected to enemy interference. Conversely, it must not be located so far to the rear that medical treatment is delayed due to the lengthened evacuation time.

*Flexibility* - Since a change in tactical plans or operations may require redistribution or relocation of medical resources, the HSS plan must be flexible. The medical commander must be able to shift HSS resources to meet the changing requirements. No more medical resources should be committed nor MTFs established than are required to support expected patient densities. When the patient load exceeds the means available for treatment, it may be necessary to give priority to those patients who can return to duty (RTD) the soonest rather than those who are more seriously injured. This ensures the manning of the tactical Commander's weapons systems.

*Mobility* - Since contact with supported units must be maintained, HSS elements must have mobility comparable to that of the units they support. Mobility is measured by the extent to which a unit can move its personnel and equipment with organic transportation. When totally committed to patient care, a HSS unit can regain its mobility only by immediate patient evacuation. When the mobility of the unit is jeopardized by the accumulation of patients, it may be necessary to leave a small holding element with the patient.

### **3. ANNEX Q**

Annex Q is the medical plan for an operation. Annex Q will be discussed as what is included in the annex. Medical plans must include the following functions into the HSS concept of operations:

- *Health maintenance*- routine sick call, physical examination, preventive medicine, dental maintenance, record maintenance, and reports submission.
- *Casualty collection*- selection of and manning of locations where casualties are assembled, triaged, treated, protected from further injury, and evacuated.
- *Casualty treatment*- triage and treatment (self-aid, buddy aid, and initial resuscitative care).
- *Temporary casualty holding*- facilities and services to hold sick, wounded, and injured personnel for a limited time, usually not to exceed 72 hours. The Medical Battalion, Marine Logistics Group, is the only HSS unit staffed and equipped to provide temporary casualty holding.
- *Casualty evacuation*- movement and ongoing treatment of the sick, wounded, or injured while in transit to MTFs. All Marine units have an evacuation capability by ground, air, or sea.

The Marine Corps organization for combat is based on its unique assigned force structure. HSS is a mission area common to every Marine Air Ground Task Force (MAGTF), regardless of the mission. Definitive operational planning for HSS is always an integral part of all MAGTF operations. The inherent flexibility in the MAGTF and the broad spectrum of potential MAGTF missions call for equal flexibility in HSS execution.

The size, type, and configuration of HSS capabilities needed to effectively support a MAGTF will be determined by mission, enemy, terrain and weather, troops and support available-time available. The following paragraphs provide an organizational framework for command and staff cognizance within which all HSS operations are executed. Marine Corps Forces (MARFOR) Commanders are responsible for coordinating and integrating HSS within their area of operations. The MARFOR Surgeon, Dental Officer, Medical Planner, and Medical Administrative Officer advise the MARFOR commander on matters relating to the health of the command, medical logistics, patient movement, sanitation, disease surveillance, medical intelligence, and medical personnel issues, as well as current and future HSS planning at the MARFOR level. Additional duties include serving as the liaison for the combatant commander and other component surgeons and monitoring HSS aspects of the time-phased force and deployment data flow.

## **Logistics of HSS Planning**

HSS logistics encompasses the procurement, initial issue, management, re-supply, and disposition of material required to support medical and dental elements organic to the MARFOR. Requisitions for Class VIIIA (consumable and equipment) material follow the same channels as other classes of supply. Guidance for planning and procuring Class VIIIB (blood products) is found in DOD Instruction 6480.4, *Armed Services Blood Program Operational Procedures*. As with all classes of supply, careful consideration should be given to stockage levels of Class VIIIA material. Commanders should not be burdened with moving and maintaining excess material, nor should the need for support ever be delayed because of inadequate access or lack of responsiveness. When the medical planner is developing and planning for appropriate levels of Class VIIIA support, the following information is crucial to ensuring that the entire HSS system is responsive to the Commander:

- Concept of operation/scheme of maneuver
- Combat intensity
- Duration of the operation
- Casualty estimates

## **Components of the Annex Q**

### Annex Q. Medical Services

- Appendix 1. Joint Medical Regulating System
- Appendix 2. Joint Blood Program
- Appendix 3. Hospitalization
- Appendix 4. Patient Evacuation
- Appendix 5. Returns to Duty
- Appendix 6. Medical Logistics (Class VIIIA) System
- Appendix 7. Preventive Medicine
- Appendix 8. Medical Communications and Information Systems
- Appendix 9. Host-Nation Medical Support
- Appendix 10. Medical Sustainability Assessment
- Appendix 11. Medical Intelligence Support to Military Operations
- Appendix 12. Veterinary Medicine
- Appendix 13. Medical Planning Responsibilities and Task Identifications

## **REFERENCES:**

FM 4-02.6  
FM 8-10-6  
MCWP 4-11.1  
MCDP- 5-1

REV: JAN 2008

**UNITED STATES MARINE CORPS  
Field Medical Training Battalion-East  
Camp Pendleton**

**FMSO 1303**

**Provide Health Services Support for the Marine Corps Missions**

**TERMINAL LEARNING OBJECTIVE**

1. Given an operational plan, commanding officer's guidance, necessary equipment and supplies, describe Health Service Support (HSS) for Marine Corps missions to support mission requirements per the references. (FMSO-HSS-1303)

**ENABLING LEARNING OBJECTIVES**

1. Without the aid of reference, given an operational plan, identify the definition of amphibious operations, within 80 percent accuracy, per MCWP 3-1, Ground Combat Operations. (FMSO-HSS-1303a)
2. Without the aid of reference, given a description or list, identify the five phases of amphibious operations, within 80 percent accuracy, per JP 3-02, Joint Doctrine for Amphibious Operations. (FMSO-HSS-1303b)
3. Without the aid of reference, given a description or list, identify the definition of Ship-To-Objective Maneuver (STOM), within 80 percent accuracy, per MCDP 1-0, Marine Corps Operations. (FMSO-HSS-1303c)
4. Without the aid of reference, given a description or list, identify health threats in a MOUT environment, to meet mission requirements, within 80 percent accuracy, per the PHTLS and MCWP 3-35.3, Military Operations on Urbanized Terrain. (FMSO-HSS-1303d)

## 1. **AMPHIBIOUS OPERATIONS**

Amphibious Operations are attacks/operations launched from the sea by naval and landing forces embarked on ships or craft involving a landing on a hostile or potentially hostile shore. Such complex and risky operations demand an integrated, seamless Health Service Support (HSS) system that extends from the initial evaluation and care given in the forward areas of the combat zone, and reaches to the treatment and patient disposition provided by continental United States (CONUS) facilities.

The Marine Corps is capable of carrying out many different types of missions from the amphibious platforms of the Navy, such as:

- Direct assault (from landing craft or helicopter)
- Raids (from landing craft or helicopter)
- Special reconnaissance
- Non-combatant evacuation
- Rescue (downed aircrew or hostage)
- Feints (amphibious operations used to divert enemy strength)
- Show of force

## 2. **PHASES OF AMPHIBIOUS OPERATIONS**

There are five phases of Amphibious Operations - Planning, Embarkation, Rehearsal, Movement, and Action.

**Planning** - the planning phase normally denotes the period extending from the issuance of an order that directs the operation to take place and ends with the embarkation of landing forces. Planning, however, is continuous throughout the operation. Although planning does not cease with the termination of this phase, it is useful to distinguish between the planning phase and subsequent phases because of the change that may occur in the relationship between amphibious force commanders when the planning phase ends and the operational phase begins.

**Embarkation** - the embarkation phase is when the landing forces with their equipment and supplies embark in assigned shipping. Organization for embarkation needs to account for flexibility to support changes to the original plan. The landing plan and scheme of maneuver ashore are based on conditions and enemy capabilities existing in the operational area before embarkation of the landing force. A change in conditions of friendly or enemy forces during the movement phase may cause changes in either plan with no opportunity for reconfiguration of the landing force. The extent to which changes in the landing plan can be accomplished may depend on the ability to reconfigure embarked forces.

**Rehearsal** - may consist of an actual landing or may be conducted as a command post exercise. The rehearsal phase is when the prospective operation is rehearsed to:

- Test the adequacy of plans, timing of detailed operations, and combat readiness of participating forces.

- Ensure that all echelons are familiar with plans.
- Provide an opportunity to reconfigure embarked forces and equipment.
- Verify communications for commonality, redundancy, security, and reliability.

**Movement** - the movement phase is when various elements of the amphibious force move from points of embarkation or from a forward-deployed position to the operational area. This move may be via rehearsal, staging or rendezvous areas. The movement phase is completed when the various elements of the amphibious force arrive at their assigned positions in the operational area.

**Action** - the decisive action phase is the period from the arrival of the amphibious force in the operational area through the accomplishment of the mission to the termination of the amphibious operation. While planning occurs throughout the entire operation, it is normally dominant prior to embarkation.

### 3. **SHIP-TO-OBJECTIVE MANEUVERS (STOM)**

STOM is the tactical implementation of Operational Maneuvers from the Sea (OMFTS) by the Marine Air Ground Task Force (MAGTF) to achieve the joint force commander's operational objectives. It is the application of maneuver warfare to amphibious operations at the tactical level of war. STOM treats the sea as maneuver space, using the sea as both a protective barrier and an unrestricted avenue of approach. While the aim of ship-to-shore movement was to secure a beachhead, STOM thrusts Marine Corps forces ashore at multiple points to concentrate at the decisive place and time in sufficient strength to enable success. This creates multiple dilemmas too numerous for the enemy commander to respond to, disrupting his cohesiveness and diminishing his will or capacity to resist. This concept focuses the force on the operational objective, providing increased flexibility to strike the enemy's critical vulnerabilities. Sea-basing of some of the fire support and much of the logistics support reduces the footprint of forces ashore while maintaining the tempo of operations. Emerging command and control capabilities will allow commanders to control the maneuver of their units the moment they cross the line of departure at sea, to include changing the axis of advance or points where they cross the beach during the assault. In STOM, rather than an amphibious assault to establish a force on a hostile or potentially hostile shore, an amphibious attack may occur. An amphibious attack may be defined as an attack launched from the sea by amphibious forces directly against an enemy operational or tactical center of gravity or critical vulnerability.

### 4. **MILITARY OPERATIONS ON URBANIZED TERRAIN (MOUT) ENVIRONMENT**

**Background** - throughout history, battles have been fought on urbanized terrain. Recent examples are Beirut, Panama City, Mogadishu, and Iraq. It is impossible to develop one set of tactics, techniques and procedures (TTPs) that can be applied to every scenario. Combatants and medical providers are required to adapt quickly to each mission, terrain, and situation.

**Definition** - military actions planned and conducted on a terrain where man-made structures influence the tactical options available. Terrain is characterized as a four-dimensional (air, buildings, streets, and subways) battlefield with the following features:

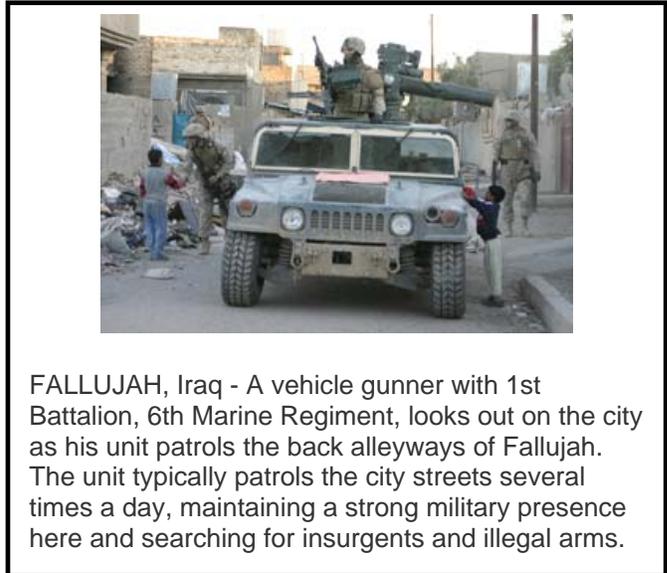
- Considerable rubble
- Ready-made fortified fighting positions
- An isolating effect on all combatants

**Considerations of MOUT**

The military commander must consider many factors when planning MOUT operations. Two of which, terrain and rules of engagement are discussed here:

**Terrain** - four-dimensional battlefield.

- Enemy observation positions are likely in high, isolated structures such as steeples or lone high-rise buildings.
- Assaulting forces can become quickly isolated, confused and cut-off by a tangle of unfamiliar structures.
- Small assaulting units are at a great disadvantage due to multiple floors, rooms, stairways, and doors. The enemy may make great use of these obstacles to inflict serious losses.



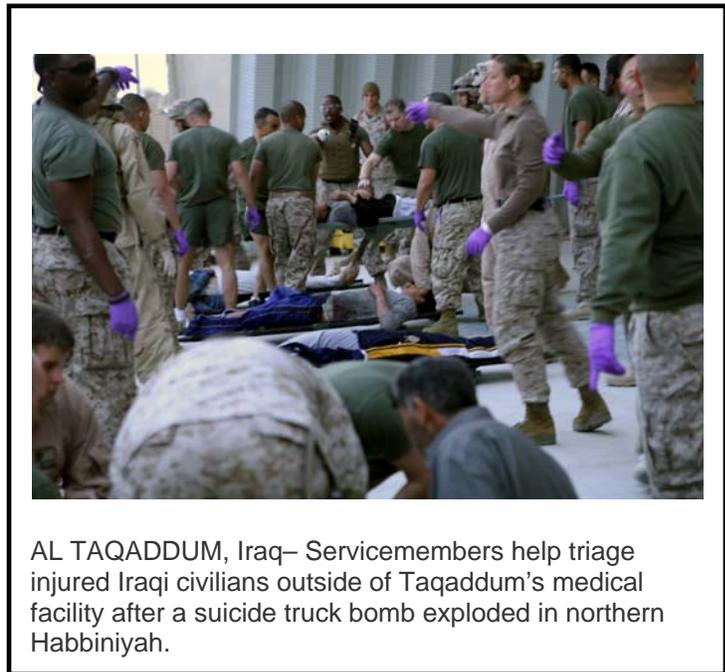
**Rules of Engagement** - “US Forces and allies operate with restrictive Rules of Engagement (ROE), reflecting the morals and values considered proper for a civilized society.

Unfortunately, the tactical advantage will often go to the belligerent, who disregards or actively endangers the safety of civilians” (PHTLS 6<sup>th</sup> ed. p. 586). Therefore, it is important to remember that every action has consequences. ROE may change from day to day, or from situation to situation. ROE are designed to:

- Avoid alienation of the local population.
- Reduce the risk of adverse world opinion.
- Preserve structures and facilities for future use.
- Preserve vital cultural facilities and grounds.

**Medical Considerations of MOUT**

Casualty rates are generally higher than conventional battles. Explosions are the most frequent cause of injury in an urban setting. These explosions may be generated from tanks, mortars, or improvised explosive devices (IEDs). Small units may be



spread out across a large area. Unit training in the practice of “self-aid” and “buddy aid” is essential. Each combatant should quickly be able to apply a tourniquet with effectiveness. In addition, effectively apply a field dressing and hemostatic agent.

**Potential Health Threats of MOUT include:**

**Psychological Casualties** - in addition to blast injuries, units are likely to experience an increase in psychological injuries. This is due to lengthy exposure to factors resulting from a constant threat of a hidden enemy. Prolonged fear of sniper fire and hidden IED’s along with the repeated sight of the dead and dying are predominant factors leading to combat stress casualties. Medical units should be prepared to treat these individuals.

**Civilian Casualties** - medical units must be prepared for the influx of large numbers of civilian casualties. Units should prepare for the possibility of geriatric and pediatric patients. Large numbers of civilians could overwhelm the capabilities of military medical units. Units should establish a plan for this possibility prior to engaging.

**Infectious Disease** - areas experiencing urban combat are likely to have many infectious diseases in the area. The problem will be worse due to poor general sanitation measures and limited amount of public health services.

**Animals** - many animals in the area (rats, mice, dogs, etc.) can also carry diseases.

**People** - interacting with the civilian populace or enemy prisoners of war can expose you or your marines to such diseases as malaria, tuberculosis, or leishmaniasis. Sexually transmitted diseases such as gonorrhea, syphilis, hepatitis, and HIV may also be prevalent.

**Water** - potable water will be limited. Troops in urban conflict can consume up to 5 quarts per day on a normal occasion and 12 quarts per day in extreme heat environments. If the demand for water is greater than the ability to re-supply, they may be tempted to drink water from local sources. This exposes them to hepatitis, intestinal parasites, and industrial toxins.

**Casualty Evacuation**

Moving casualties in an urban environment can be difficult and time consuming. Moving a litter patient only a few hundred yards could take an hour or more.

Ground evacuation vehicles will require heavy armor that can withstand small arms fire as well as rocket propelled grenades (RPGs) and IEDs. Helicopter evacuation is difficult due to the tight operating environment. They too are susceptible to small arms fire and RPGs.



Twentynine Palms, CA- Marines from 3rd Battalion, 5th Marine Regiment, carry a “casualty” to safety in the urban assault lane of the training at Range 215. The MOUT facilities were built to replicate the actual environment that Marines will face when deployed.

## **Special Equipment Requirements of CASEVAC**

Simply finding casualties in an urban environment can be difficult. Explosions can cause buildings to crumble (see picture below), trapping patients inside. Vehicles can crash due to explosions, hostile fire, or operator error. Events such as these may lead to complicated rescue efforts that require special equipment such as axes, crowbars, jacks, ropes, collapsible litters, and cutting tools.



**UNITED STATES MARINE CORPS**  
Field Medical Training Battalion  
Camp Pendleton, CA

**FMSO 1201**

**Military Map Fundamentals**

**TERMINAL LEARNING OBJECTIVES**

- (1) 1. Given the requirements, 1:50,000 military map, military protractor, and map pens, identify the fundamentals a military map to meet mission requirements. per FM 21-26 (FMSO 1201)

**ENABLING LEARNING OBJECTIVES**

- (1) 1. Without the aid of references, given a description or list, describe the purpose of a military map to eighty percent accuracy per FM 21-26. (FMSO 1201a)
- (2) Without the aid of references, given a description or list, identify the five basic colors on a military map to eighty percent accuracy per FM 21-26. (FMSO 1201b)
- (3) Without the aid of references, given a description or list, identify the marginal information on a military map to eighty percent accuracy per FM 21-26. (FMSO 1201c)
- (4) Without the aid of references, given a description or list, describe the purpose of contour lines on a military map to eighty percent accuracy per FM 21-26. (FMSO 1201d)
- (5) Without the aid of references, given a description or list, identify the terrain features on a military map to eighty percent accuracy per FM 21-26. (FMSO 1201e)
- (6) Without the aid of references, given a description or list, identify the distance between two locations on a military map to eighty percent accuracy per FM 21-26. (FMSO 1201f)
- (7) Without the aid of references, given a 1:50,000 military map, military protractor, map pens and a set of eight-digit grid coordinates, locate a position on a military map to eighty percent accuracy per FM 21-26. (FMSO 1201g)

- (8) Without the aid of references, given a description or list, identify the grid azimuth between two points on a military map to eighty percent accuracy per FM 21-26. (FMSO 1201h)
- (9) Without the aid of references, given a description or list, describe the method used to orient a military map to eighty percent accuracy per FM 21-26. (FMSO 1201i)
- (10) Without the aid of references, given a description or list, identify the unit symbols used on a military map to eighty percent accuracy per Guidebook for Marines. (FMSO 1201j)

## 1. **THE MAP**

a. **Purpose** – The purpose of a map is to provide information on the existence, the location, and the distance between ground features.

b. **Definition** – A geographic representation of the earth's topographical surface drawn to scale as seen from above.

(1) The map shows us what an area actually looks like without being there.

(2) The map is a clear and handy reference tool.

### c. **Characteristics of a Map**

(1) Designed to show common information

(2) Location of ground features and objects

(3) Populated areas such as cities, towns, villages

(4) Routes of travel such as freeways, highways, road, streets, bridges

(5) Communication lines such as telephone lines and power lines

(6) Extent of vegetation cover such woodland, jungle, brush-grassland, swamps

(7) Relief and elevation of the earth's surface.

### d. **Care and Importance**

(1) Military maps are printed on paper and require protection from water, mud and tearing. When you use map pens on a map, make sure that you have light thin marks, which are easily erased that does not smear. When trimming the map; be careful not to cut any of the marginal information.

(2) Maps must be protected because they can hold tactical information, such as:

(a) Friendly Positions

(b) Friendly Supply Points

## 2. MAP ILLUSTRATIONS

### a. Symbols

- (1) Mapmakers use standard symbols
- (2) Symbols represent natural and man-made features
- (3) They resemble as closely as possible, the actual features as seen from above.

b. **Map Colors** – Map colors are used to ease the identification of features on the map. The topographical symbols are usually printed in different colors, with each color identifying the type of feature. The colors vary with different types of maps, but on a standard, large scale, topographic map, there are five basic colors.

- (1) **Black** – Used to identify the majority of cultural or man-made features such as buildings, houses, bridges, and roads not shown in red.
- (2) **Red** – Main roads in built up areas, and special features such as dangerous or restricted areas.
- (3) **Blue** – Used for water features such as oceans, seas, lakes, rivers, swamps, creeks, streams, tributaries, estuaries, and ponds.
- (4) **Green** – Identifies the extent of vegetation such as woodland forest, tropical jungle, brush/grasslands, savanna, and swamps.
- (5) **Red Brown** – All landforms such as contours, fills, and cuts.

## 3. MARGINAL INFORMATION

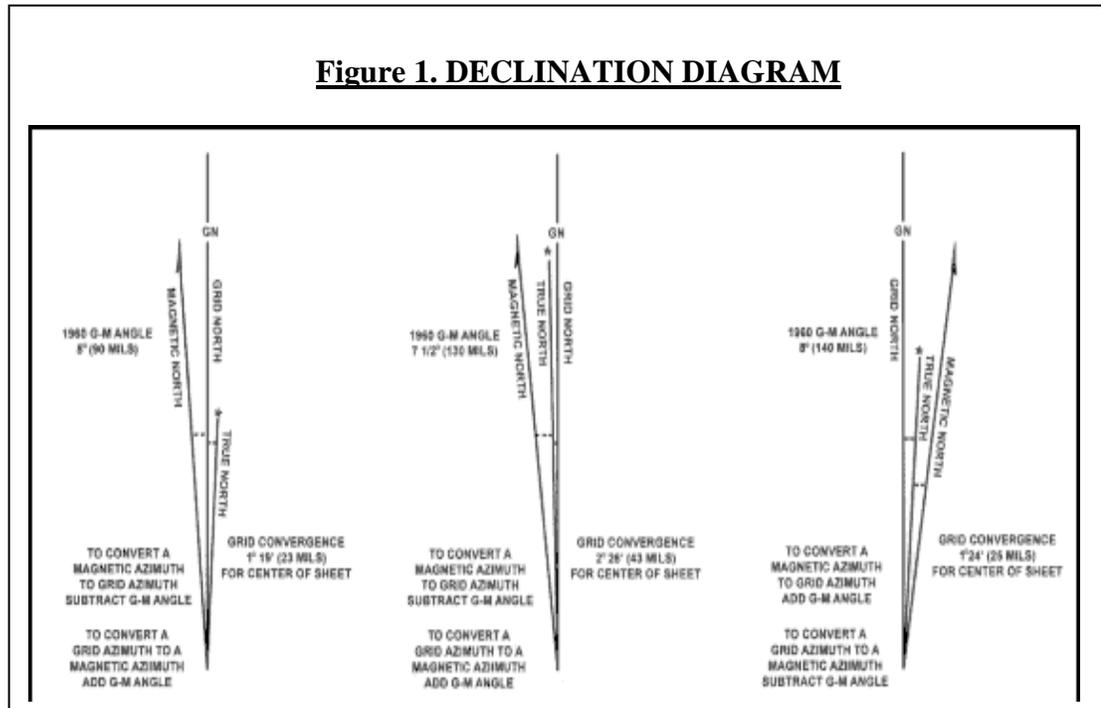
a. **Margin of Information** – The instructions that are placed around the outer edges of the map are known as the margin of information. All maps are not the same, so every time a different map is used one must examine the margin of information carefully.

b. **Elevation Guide** – This guide is a miniature characterization of the terrain shown. This guide helps you rapidly identify major land forms.

c. **Contour Interval Note** – This states the vertical distance between adjacent contour lines on the map. Intervals are indicated in meters.

d. **Grid Squares** – These intersect at right angles of the horizontal and vertical grid lines. Most military maps contain grid squares that are 1000 meters by 1000 meters.

e. **Declination Diagram** – This indicates the angular relationship of true north, grid north and magnetic north. New map editions indicated how to convert azimuths from grid to magnetic and vice versa.



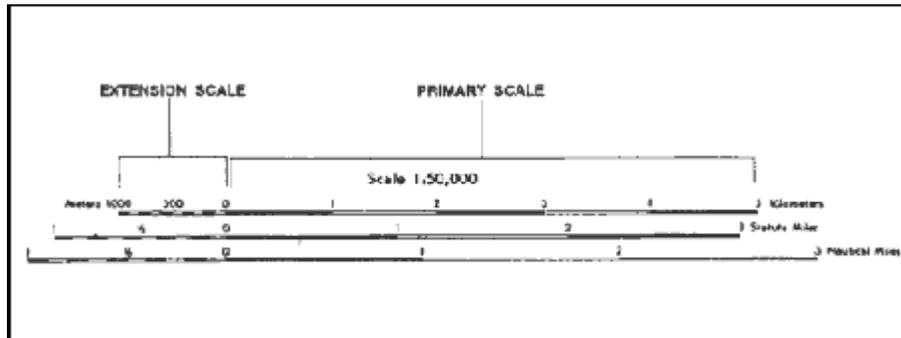
- (1) **True North** – A line from any position on the earth's surface to the North Pole. Unlike grid lines, all lines of longitude are true north lines.
- (2) **Magnetic North** – The direction to the North Magnetic Pole, as indicated by the north-seeking arrow in a magnetic compass. The North Magnetic Pole is located in Canada west of Baffin Island which is gradually moving at a pace of 50 kilometers a year in a North-Westerly direction.
- (3) **Grid North** – This base line is established by using the vertical grid lines on the map. Use a protractor in conjunction with the vertical grid lines to determine or plot a grid azimuth on a map.
- (4) **Grid Magnetic (G-M) Angle** – The G-M angle is an important factor in map reading. The G-M angle is used to convert a magnetic azimuth to a grid azimuth and vice versa.

(5) **Grid Azimuth** – When a line is drawn between two locations on a map, the protractor is used to determine the angle of the line between grid north and the drawn line in a clockwise direction.

(6) **Magnetic Azimuth** – A magnetic azimuth is an angle measured in a clockwise direction from magnetic north that is taken from a magnetic compass.

f. **Legend** – The legend is located in the lower left margin which illustrates and identifies the topographic symbols used to depict some of the more prominent features on the map.

g. **Bar Scales** – Bar scales are used to convert map distance to ground distance. Maps may have three or more bar scales, each in a different unit of measure. Exercise care when using the scales, especially in the selection of the unit of measure. The bar scales are located in the center of the lower margin.



h. **Sheet Name** – A map is named after the most prominent cultural or geographical feature. Usually the name of the largest city is used.

i. **Sheet Number** – The sheet number is used as a reference number for that map sheet.

j. **Series Name** – It usually includes a group of similar maps at the same scale and/or the same sheet lines designed to cover a particular geographical area.

k. **Series Number** – The series number is a sequence reference expressed either as a four-digit number (1125) or as a letter, followed by a three or four-digit number (M556: N3341).

l. **Edition Number** – The edition number represents the age of the map in relation to other editions of the same map and the agency responsible for its production. For example, EDITION 5-DMATC indicates the fifth edition prepared by the Defense Mapping Agency Topographic Center. Higher map editions, contain newer data.

m. **Index to Boundaries** – This shows the boundaries that occur within the map area such as county lines and state boundaries.

n. **Adjoining Sheets Diagram** – This usually contains nine rectangles, but the number may vary depending on the locations of the adjoining sheets. All represented sheets are identified by their sheet numbers.

o. **Scale** – The scale note is a representative fraction that gives you the ratio of a distance on the map to the corresponding distance on the earth's surface.

#### 4. **RELIEF AND ELEVATION**

a. **Contour Lines** – A contour line is a line representing an imaginary line on the ground along which all points are the same elevation. They indicate a vertical distance above or below the datum plane. The vertical distance between adjacent contour lines is known as contour interval, and the amount of the contour interval is given in the marginal information. Starting at sea level, the zero contour, each line represents an elevation above sea level. Contour lines indicate the nature of the slope.

##### b. **Types of Contour Lines**

(1) **Index Contour Line** – Starting at zero elevation, every fifth contour line is drawn with a heavier line. These are known as index contours. Somewhere along each index contour, the line is broken and its elevation is given.

(2) **Intermediate Contour Lines** – The contour lines falling between index contours are called intermediate contour lines. They are drawn with the finer line than the index contours and do not have their elevation given.

c. **Determining Elevation** – Using the contour lines on a map, the elevation of a point may be determined by:

- (1) Finding the contour lines on a map from the marginal information, and noting both the amount and the unit of measure.
- (2) Finding the numbered contour line nearest the point for which the elevation being sought.
- (3) Determining the direction of the slope from the numbered contour lines to the desired point.
- (4) Counting the number of contour lines that must be crossed to go from the numbered index contour line to the desired point and noting the direction-up or down.

d. **Types of Terrain Features**

- (1) **Hill** – A hill is an area of high ground. From a hilltop, the ground slopes down in all directions. A hill is shown on a map by contour lines forming concentric circles. The inside of the smallest closed circle is the hilltop.

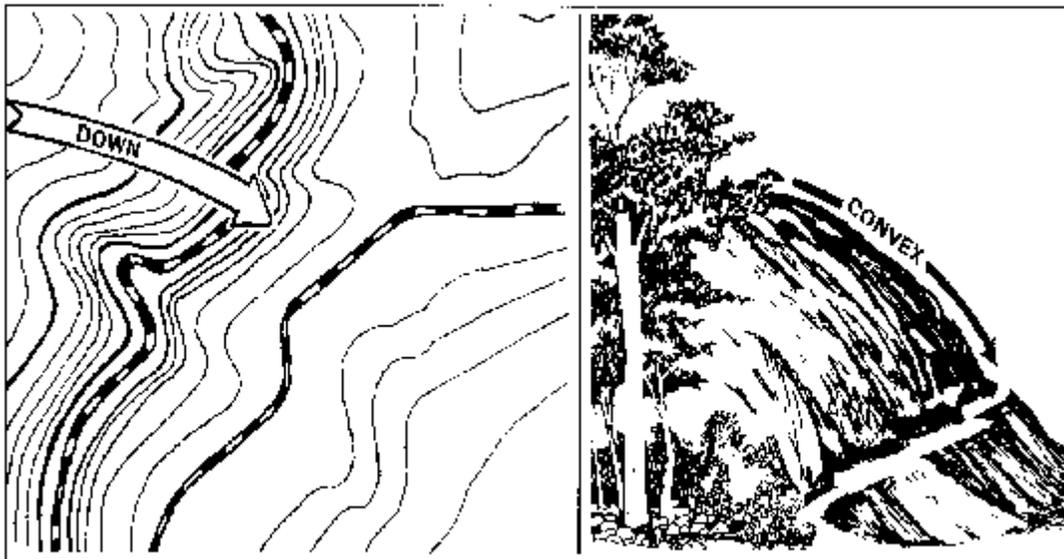
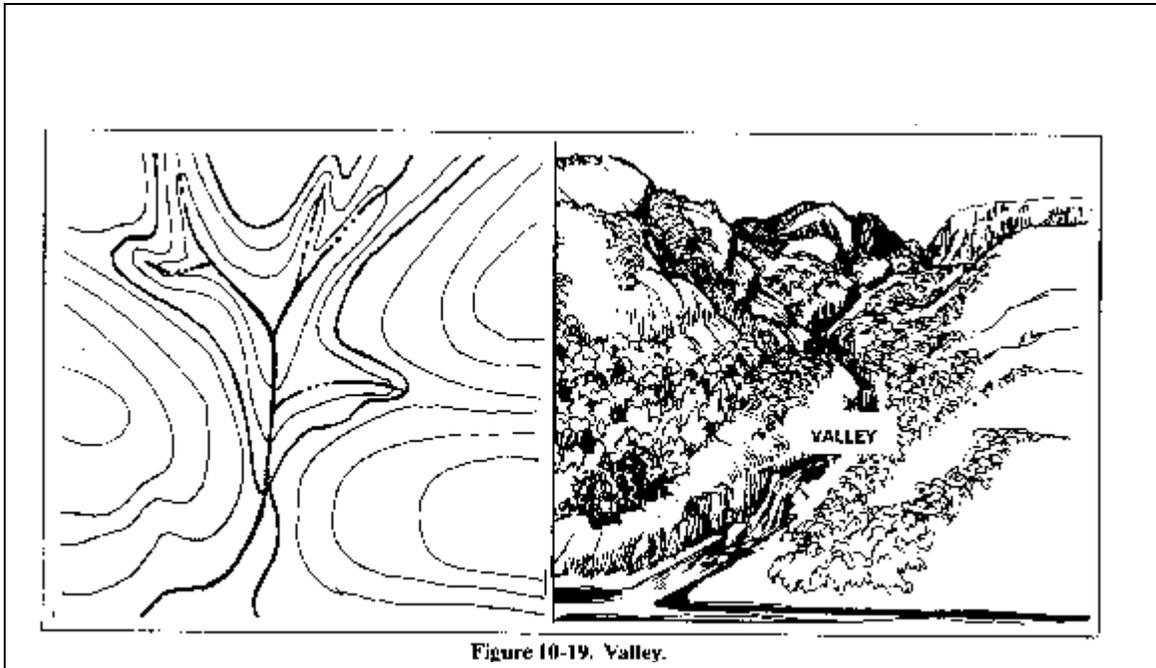
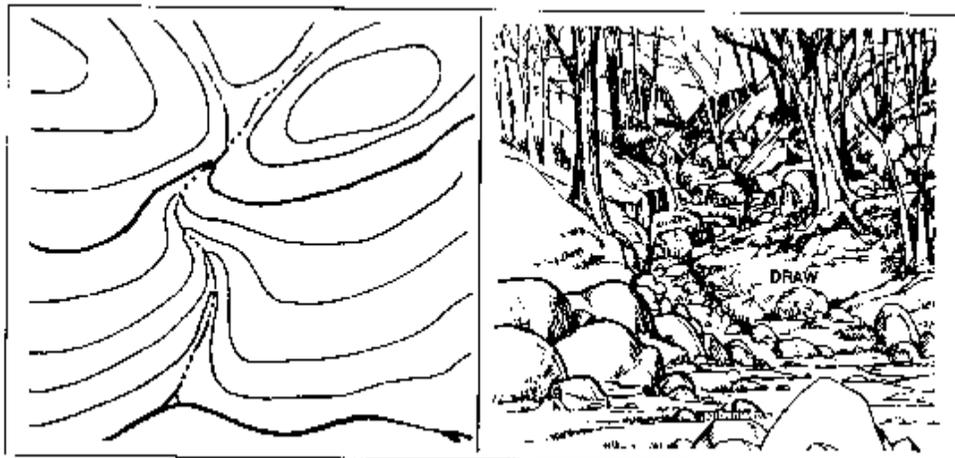


Figure 10-3. Convex slope.

(2) **Valley** – A valley is continuous line of low ground that normally rest in between two roughly parallel ridges. Valleys often have streams or rivers running through them.



(3) **Draw** – A draw is a short, continuous sloping line of low ground, normally cut into the side of a ridge or hill. Often, there is a small stream running down the draw. In a draw, there is essentially no level ground. Therefore, little or no maneuver room exists within its confines. The ground slopes upward in three directions and downward in the other direction which is depicted with a 'U' or 'V' pointing toward high ground.



(4) **Ridge** – A ridge is a series of hills that are connected to each other near the top. A ridge line may extend for many miles. It may be winding or quite straight. It may have a reasonably uniform elevation along its top or it may vary greatly in elevation.

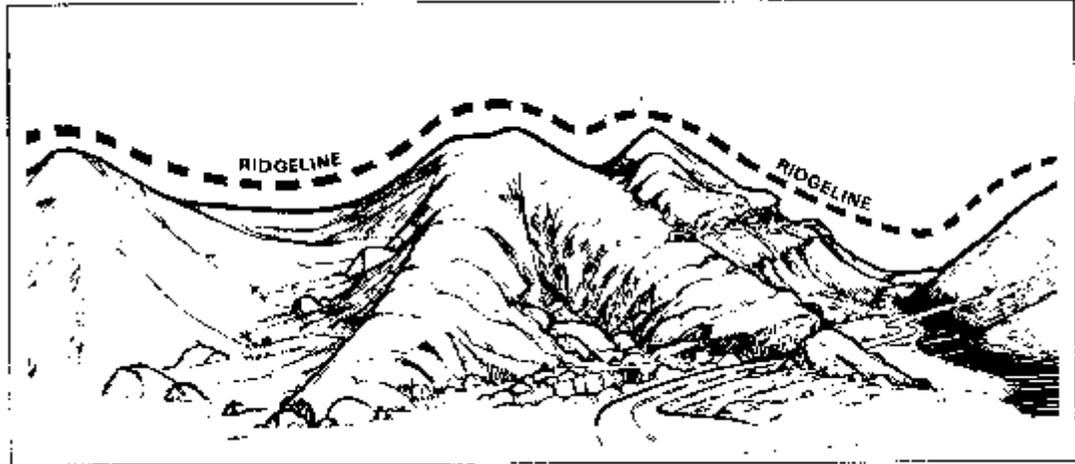


Figure 10-16. Ridgeline.

(5) **Saddle** – This is a dip or low point between two areas of higher ground. A saddle is not necessarily the lower ground between two hilltops; it may be simply a dip or break along a level ridge crest. If you are in a saddle, there is high ground in two opposite directions and low ground in the other two directions. A saddle is normally represented as an hourglass or by figure-eight shaped contour lines.

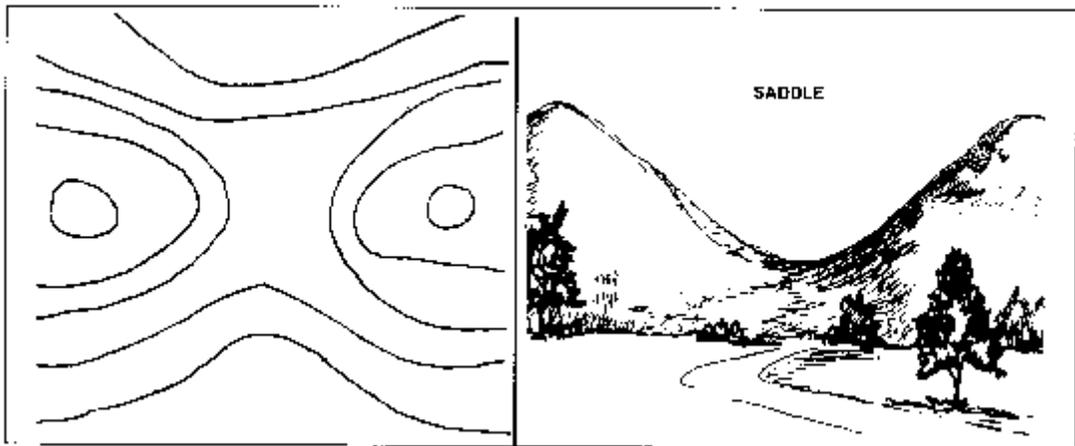
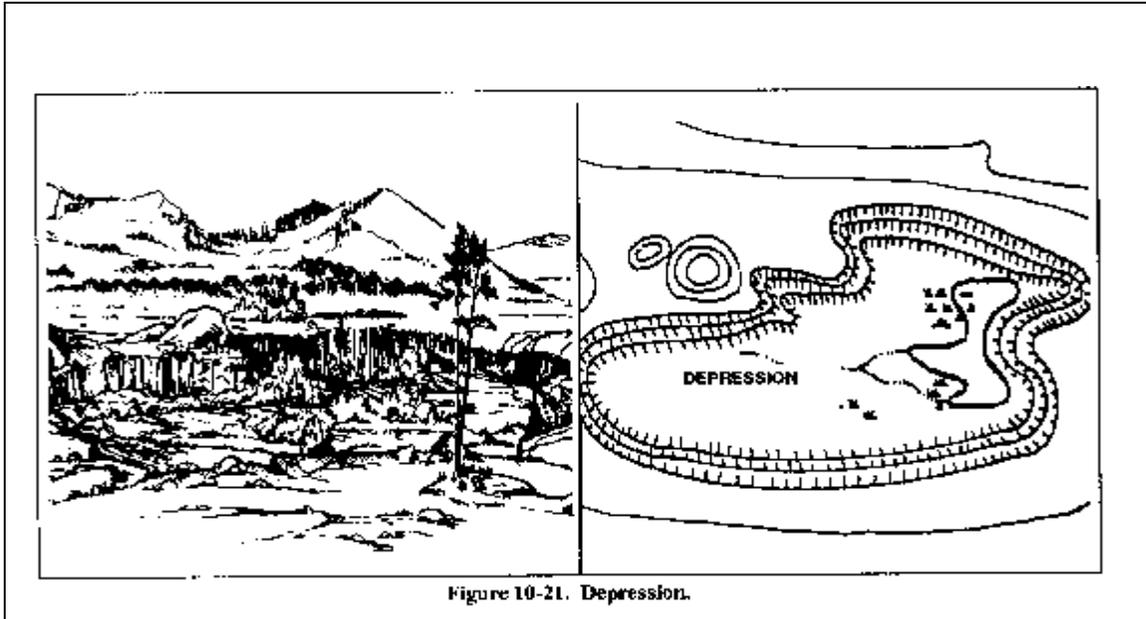


Figure 10-18. Saddle.

(6) **Depression** – A low point in the ground or a sinkhole. It is an area of low ground surrounded by higher ground in all directions or simply a hole in the ground. Usually only depressions that are equal to or greater than the contour interval will be shown. On maps, depressions are represented by closed contour lines that have tick marks pointing toward low ground.



(7) **Cliff** – A cliff is a vertical or near vertical terrain feature. It is an abrupt change of the land. When a slope is so steep that the contour lines converge into one “carrying” contour of contours, this last contour line sometimes has tick marks pointing toward low ground.

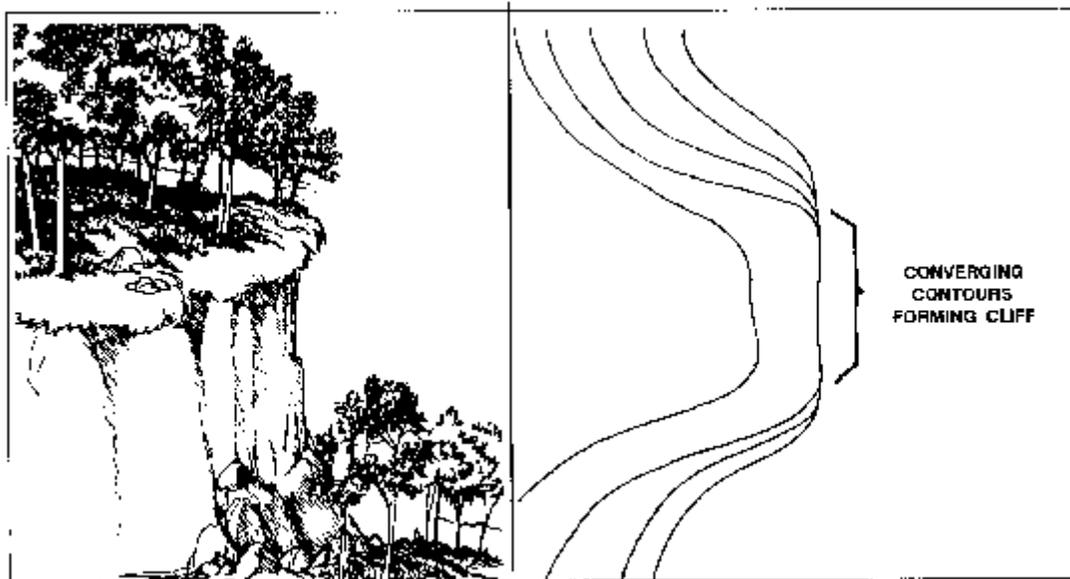


Figure 10-24B. Cliff.

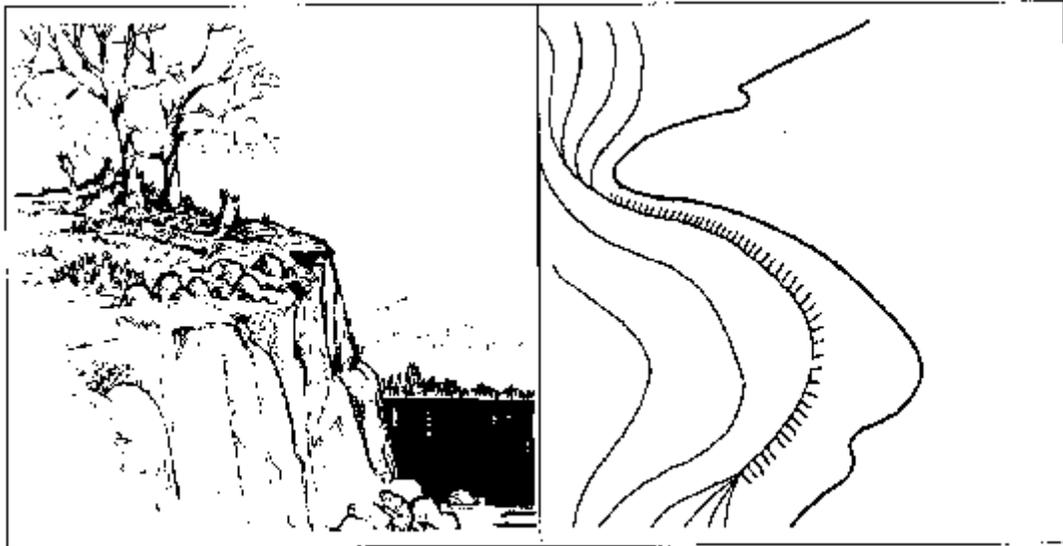


Figure 10-24A. Cliff.

(8) **Finger** – A finger is a short, continuous sloping line of higher ground, normally jutting out from the side of a ridge or hill. A finger is often formed by two roughly parallel draws. The ground slopes down in three directions and up in one. Contour lines on a map depict a finger with the “U” or “V” pointing away from high ground.

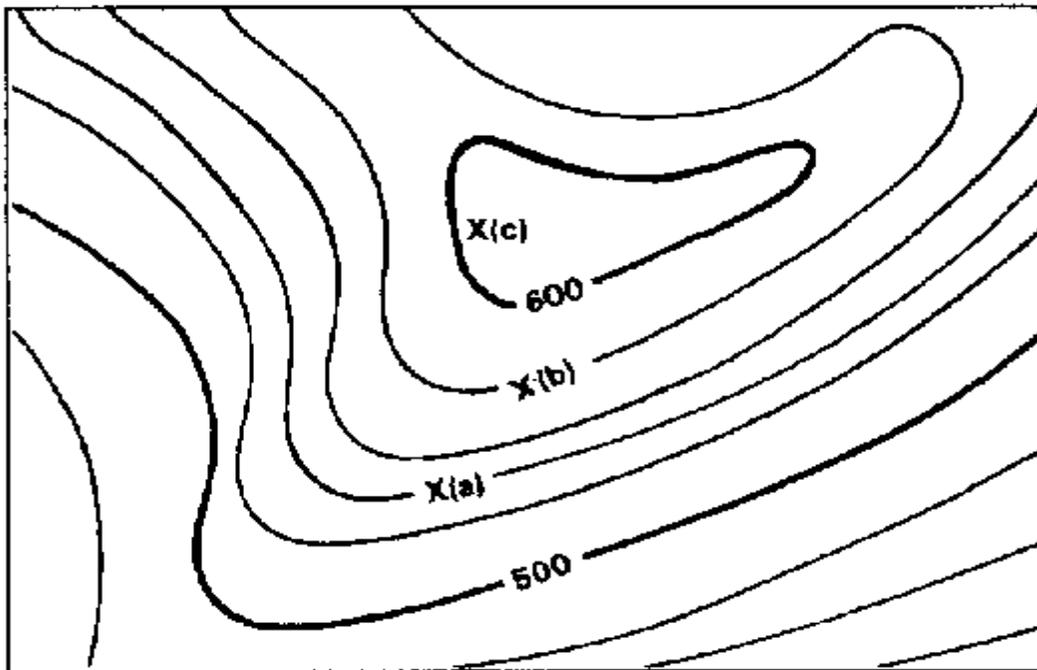


Figure 10-3. Points on contour lines.

## 5. MEASURING DISTANCE ON A MAP

a. **Straight Line Distance** – To measure a straight line distance between points:

- (1) Lay a straight strip of paper on the map so that the edge touches the center.
- (2) Make a tick mark on the edge of the paper at each point.
- (3) Lay the paper strip along the scale that corresponds to the unit of measure you are working with.
- (4) Place the right tick mark of the paper strip on the largest full unit on the primary scale (to the right of zero), allowing the remainder to fall on the extension of the scale (to the left of zero).

b. **Curved or Irregular Distance** – To measure distance along a winding road, stream or any curved line.

- (1) Make a tick mark near or one end of the irregular line to be measured.
- (2) Align the paper strip along the center of the first straight portion of line.
- (3) Make a tick mark at the other end of that portion on both the paper strip and the map.
- (4) Keeping both tick marks together, pivot the strip about the second tick mark until another straight portion of that line is aligned.
- (5) Continue this process until the measurement is completed, then place the paper strip on the appropriate bar scale, and determine the ground distance measured.

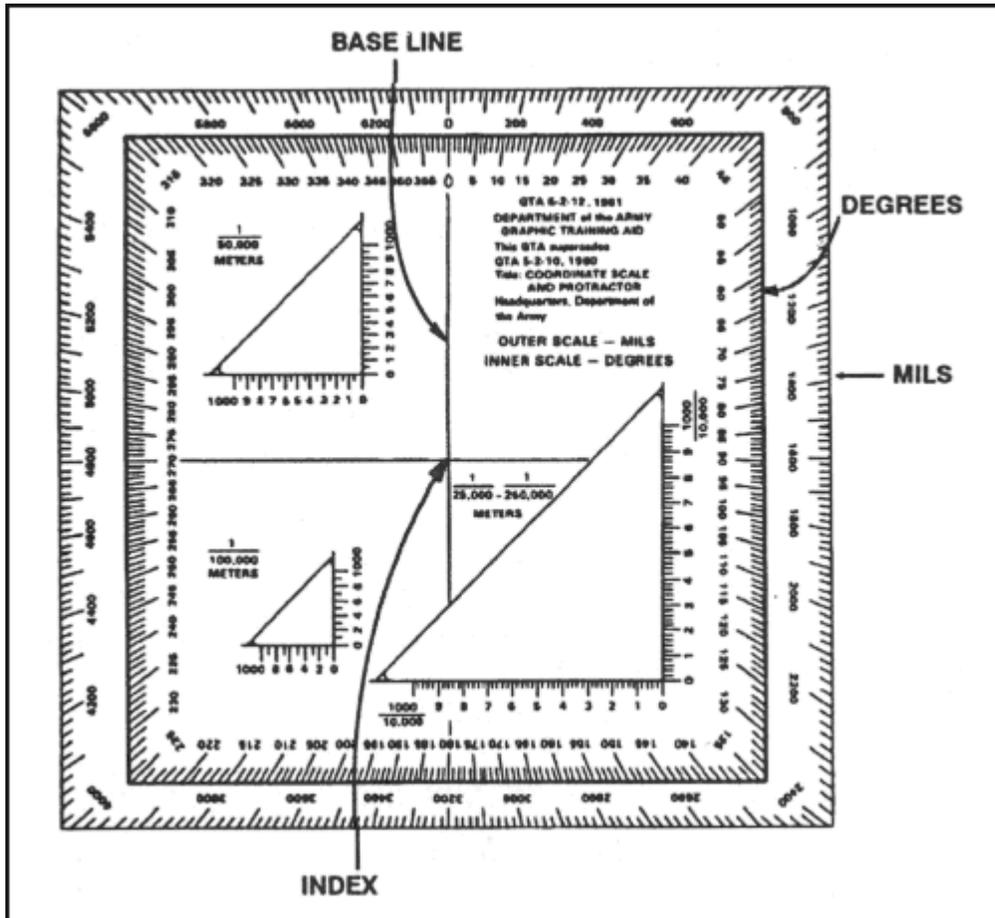
## 6. HOW TO LOCATE A POSITION

a. **Protractor**

- (1) There are several types of protractors. All of them divide the circle into units of angular measure, and each has a scale around the outer edge and an index mark.
- (2) The index mark is the center of the protractor circle from which all directions are measured.

- (3) The military protractor, GTA 5-2-12, contains two scales; one in degrees (inner scale) and one in mils (outer scale).
- (4) This protractor represents the azimuth circle.
- (5) The degree scale is graduated from  $0^{\circ}$  to  $360^{\circ}$ ; each tick mark on the mark on the degree scale represents one degree. A line from  $0^{\circ}$  to  $180^{\circ}$  is called the base line of the protractor. Where the base line intersects the horizontal line, between  $90^{\circ}$  and  $270^{\circ}$ , is the index or center of the protractor.
- (6) When using the protractor, the base line is always oriented parallel to a north-south grid line. The  $0^{\circ}$  or  $360^{\circ}$  mark is always toward the top or the north on the map and the  $90^{\circ}$  mark is to the right.

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## **b. Locate Grid Coordinates on a Map**

(1) **Grid Lines** – Grid lines are a series of straight lines that intersect at right angles and form a series of squares. It is a system of squares similar to the block system of most city streets. Two digits are printed in large type at each end of the grid lines, and these same two digits appear at intervals along the grid lines on the face of the map. They are called principal digits.

(2) **Vertical Grid Lines** – These run from the bottom of the map sheet to the top of the sheet, they function as left or right and east or west of a grid square and are labeled in the margin.

(3) **Horizontal Grid Lines** – These run from the left side of the map sheet to the right side of the map sheet (east to west or left to right). They function as the bottom and top boundaries (southern and northern) of a grid square and are labeled in the margin.

(4) **Basic Map Reading Rule** – The designation of a point is based on the principle right then up. Always read right on the vertical grid lines right then up on the horizontal grid lines.

(5) **Grid Square Identification** – Apply the map reading rule to identify a grid and locate a point within a grid square.

(a) The coordinates of a grid square are found by combining the values of the vertical and horizontal grid lines that form the lower left handed corner of that grid square.

(b) First read right to the vertical grid line that forms the left or west boundary of the grid square and record the principal digits.

(c) Next read up on the horizontal grid line that forms the left or west boundary of the grid square and record the principal digits.

(d) The combination of the principal digits that label the vertical grid line and horizontal grid line are the identification of the grid square or its coordinates.

(e) A four digit grid coordinate locates a point within 1000 square meters, on the map, which is called as grid square.

(f) A six digit grid coordinate will locate a point on a map within 100 meters.

(g) An eight digit grid coordinate will locate a point on a map within 10 meters and a 10 digit grid will locate a point within one meter.

c. **Plotting points on a Map**

(1) **6-Digit Grid Coordinate** – Imagine dividing a grid square into 100 smaller squares. The coordinates of a point in such a grid square will have six digits. Each of the grid squares are 1000 meters by 1000 meters. Each grid square is divided into 100 smaller squares, each 100 meters long and 100 meters high. Read RIGHT, then UP for a 6-digit grid coordinates.

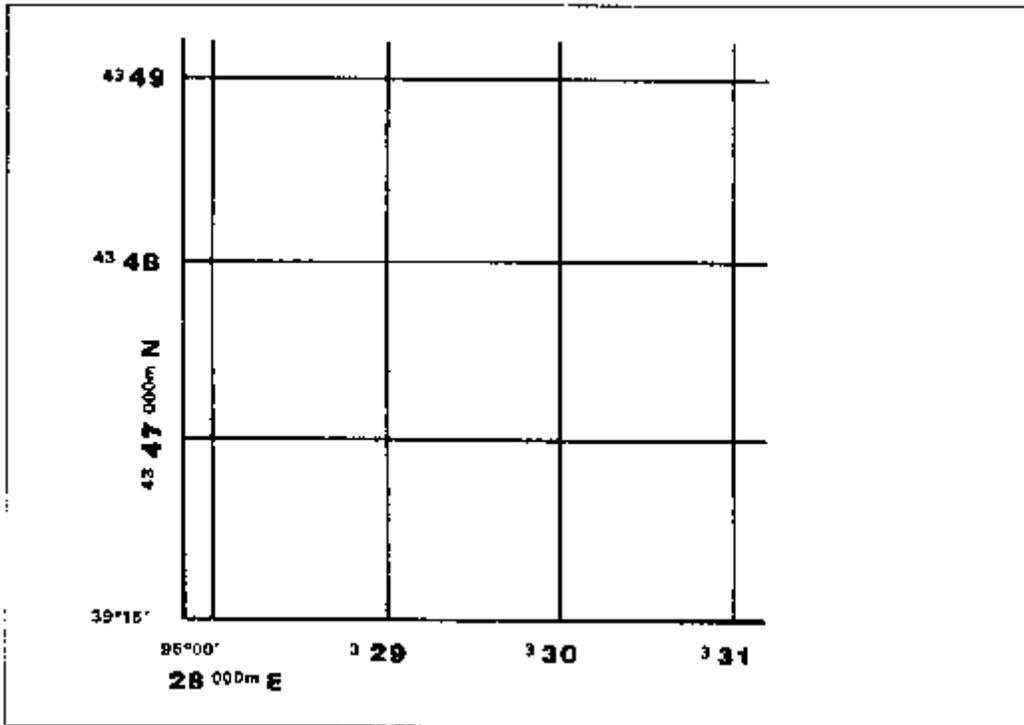


Figure 4-12. Grid lines.

(2) **Protractor** – If you require a more accurate 6-digit grid coordinate than can be obtained by estimation, you should use a coordinate scale. There are three coordinate scales located on your protractor: 1:100,000 or 1:50,000 or 1:25,000. Use the one that corresponds with the scale of the map you are using. In most case, it will be 1:50,000

- (a) Place the proper coordinate scale of your protractor on the map so that the zero-zero point is to the bottom right of the scale.
- (b) Place the zero-zero point at the lower left hand corner of the grid square so that you have a 4-digit grid coordinate.
- (c) Keeping the horizontal line of the scale directly on top of the East-West grid line and slide it to the right until the vertical line of the scale touches the point which the coordinates are desired.

(d) Examine the two sides of the coordinate scale to ensure that the horizontal line of the scale is aligned with the East-West grid line and the vertical line of the scale is parallel with North South grid line.

(e) Determine your RIGHT reading by first reading the value of grid line to the left of the point. Add to this value the number that tells how far into the grid square point is.

(f) Determine your UP reading by first reading the value of the horizontal grid line below the point. Add to this value the number which tells how far the point is up in the grid square. When determining both your RIGHT and UP reading, round your value to the closest number on you coordinate scale.

(g) By combining the RIGHT reading with UP reading, you have accurately determined the 6-digit grid coordinate.

(3) **8-Digit Grid Coordinates** – In some mapping situations, it is desirable to further divide a 100-meter grid square into 10-meter grid squares. This is done in the same manner as dividing a 1,000 meter grid square into 100-meter grid squares, either through estimation or by use of a coordinate scale. The result is an 8-digit grid coordinate which identifies a point on the map to with 10 meters.

(4) **Locating Points on a Map** – To locate a point on the map, using the following steps:

(a) Locate the correct grid square by determining the 4-digit grid coordinates from the given 6-digit coordinates.

(b) Have your 6-digit coordinates into two parts.

(c) Determine the vertical (north-south) grid line. It is the first two numbers of your RIGHT reading.

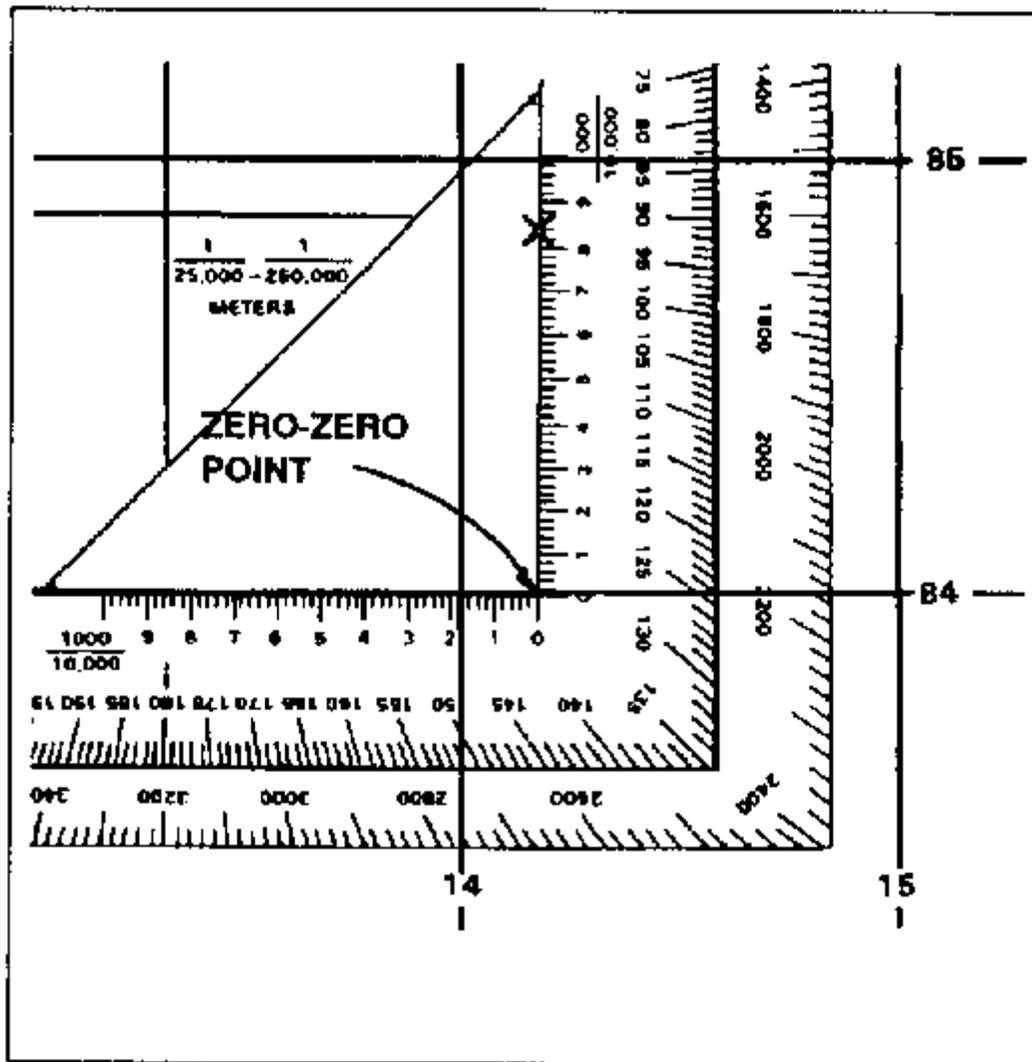
(d) Determine the horizontal (east-west) grid line. It is the first two numbers of your UP reading.

(e) Plot the coordinates by placing the proper coordinate scale of your protractor with the zero-zero point at the lower left hand corner of the grid square and keep the horizontal line of the scale directly on top of the east-west grid line.

(f) Examine the two sides of the coordinate scale to ensure that the horizontal line of the scale is aligned with east-west grid line and the vertical line of the scale is parallel with north-south grid line.

(g) Move the protractor to the right until the vertical grid line intersects the horizontal scale at the 100-meter reading and the other point is your RIGHT reading.

(h) Determine the position of your UP reading by plotting a plot adjacent to your vertical scale equal to your UP reading.



**Figure 4-16. Placing a coordinate scale on a grid.**

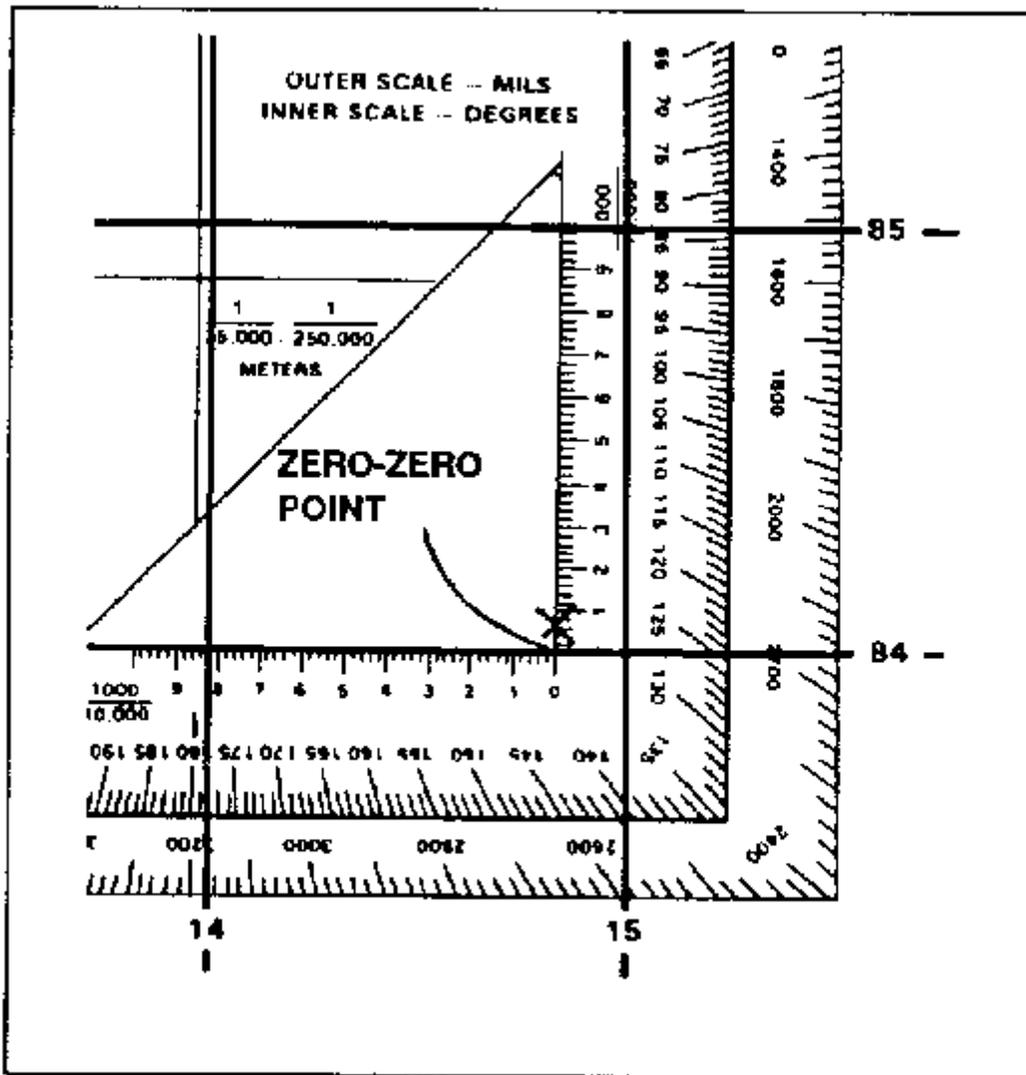


Figure 4-17. Zero-zero point.

## 7. PLOTTING A GRID AZIMUTH

a. **Azimuth Defined** – An azimuth is a straight line from one point to another. An azimuth is also measured in a clockwise direction from a predetermined base line such as the index mark on the protractor. An azimuth is an angle that is also part of a circle. An azimuth has 360 degrees.

b. **Measured in a Clockwise Direction** – The base line of an azimuth is  $0^\circ$  or  $360^\circ$  that progress in a clockwise direction in numerical value around the circle until it returns to the starting point. All azimuths between  $0^\circ$  and  $180^\circ$  will be on the right side of the imaginary circle and all azimuths between  $180^\circ$  and  $360^\circ$  will be on the

left side of the circle. Keep in mind that there are only 360 degrees in a circle. For example, if you add  $15^\circ$  to  $350^\circ$ , then it would be expressed as  $5^\circ$  and not as  $365^\circ$ .

c. **From a Predetermined Base Line** – When we say that an azimuth is an angle measured in a clockwise direction from a predetermined baseline, we mean that it is a certain number of degrees measured in a clockwise direction from some sort of reference point. It is this portion of the definition that causes the most misunderstanding. There are three base lines—true north, magnetic north and grid north.

d. **Determining a Grid Azimuth** – There are two methods of measuring grid azimuths from one point to another on the map. Just remember that you are dealing with GRID AZIMUTHS which can not be followed with a compass.

(1) **Protractor and String Method** – Modify your protractor by punching a hole through the index mark with a needle. Have a 6 inch string and tie a knot on each side of the protractor as close to the index line as possible to secure it.

(a) Place the index mark on your starting point and ensure that the vertical base line is parallel with a north-south grid line and the horizontal base line is parallel with an east-west grid line.

(b) Hold the protractor firmly against the map with one hand and stretch the piece of string with your other hand so that the string intersects your second point.

(2) **Protractor and Pencil Method** - Just remember that if you go in a straight line from one point to another, the azimuth will never change if you maintain that straight line.

(a) Use an edge to draw a line connecting two points.

(b) Label the two points A and B, with A as your start point

(c) Place the index mark of your protractor on the line you just drew where that line intersects a vertical grid line. This point should be as close as possible to point A. Make sure that the vertical base line on your protractor is directly on the vertical grid line that your line intersects.

e. **Plotting a Grid Azimuth**– Follow these steps.

(1) Place the protractor on the map with the index mark at center mass of the known point.

(2) Ensure the protractor's vertical base line is parallel with the closest north-south grid line and the horizontal base line is parallel with an east-west grid line.

- (3) Mark on the map at the desired grid azimuth.
- (4) Remove the protractor and draw a line connecting the known point and mark on the map.
- (5) Plot a known distance onto that azimuth, use a piece of paper to transfer the distance from the scale to the plotted azimuth.

f. **Determining a Grid Back Azimuth**

- (1) Back azimuth is the reverse direction of a forward azimuth.
- (2) To obtain a grid back azimuth from an azimuth less than  $180^\circ$ , add  $180^\circ$  and if the azimuth is  $180^\circ$  or more, subtract  $180^\circ$ . Use the acronym, L.A.M.S  $180^\circ$
- (3) This lesson will not cover the compass concepts.

8. **ORIENTATION OF A MAP**– You can use map orientation to determine your location. The map is oriented when it is in position with north and south corresponding to north and south to the physical earth.

a. **Orientating Without a Compass: Terrain Association** – You can orient your map by using terrain association when a compass is not available or when you have to make quick references as you move across country. Examine the map carefully and the features on the ground to linear features common to both such as roads, railroads, fence lines or power lines etc.

- (1) Identify prominent terrain features on the map and on the ground.
- (2) Align the terrain features with the map. If there is a tower to right front, then orient the map so that the tower is to you right front. If there is a road off to your left, then ensure the road on the map is parallel to the road on the ground. Once all of the features are lined up, then your map is oriented.

b. **Determining Your Position** – Now that you can orient your map, you must find your location on a map. If you know you're approximate location on a map, a study of nearby terrain features will help you determine your position.

- (1) Determine your location by inspection. If you are standing in the vicinity of several prominent features which can easily be located on the map. By orienting the map and estimating your relation to these features, you should have no difficulty in determining your location.

9. **MILITARY SYMBOLS ON A MAP** – When the Marine Corps is on the move on land, it also moves its actions onto the map of the land where military activities are being conducted. There are map symbols for military activities. The symbols for different kinds of military units are not only very simple, but they are connected with the nature of the military activity itself which involves you.

a. **Unit Symbols** – The basic symbol for a military unit is a rectangle. We put a little staff on the rectangle and make a flag out of it; that means a command post or headquarters. The flag represents the unit commander’s flag. Symbols are also used to show the size or type of the military unit.



**UNIT**



**COMMAND POST**



**FIELD ARTILLERY**



**RECONNAISSANCE**



**INFANTRY**



**ARMORED**



**MECHANIZED INFANTRY**



**MEDICAL CORPS**



**TRANSPORTATION CORPS**



**AIR FORCES**



**AIRBORNE INFANTRY**



**ENGINEERS**



**ANTICRAFT ARTILLERY**



**ORDNANCE**

### **Size Symbols**

The following symbols placed either in boundary lines or above the rectangle, triangle, or circle inclosing the identifying arm or service symbol indicate the size or type of military organization:

Squad



Section



Platoon



Company, Troop, Battery, Air Force flight



Battalion, Cavalry Squadron, or Air Force Squadron



Regiment or Group; combat team



Brigade, Combat Command of Armored Division, or Air Force Wing



Division or Command of an Air Force



Corps or Air Force



Army



Group of Armies



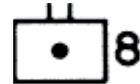
## EXAMPLES

The letter or number to the left of the symbol indicates the unit designation; that to the right, the designation of the parent unit to which it belongs. Letters or numbers above or below boundary lines designate the units separated by the lines:

Company A, 137th Infantry



8th Field Artillery Battalion



Combat Command A, 1st Armored Division



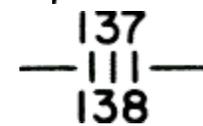
Observation Post, 23d Infantry



Command Post, 5th Infantry Division

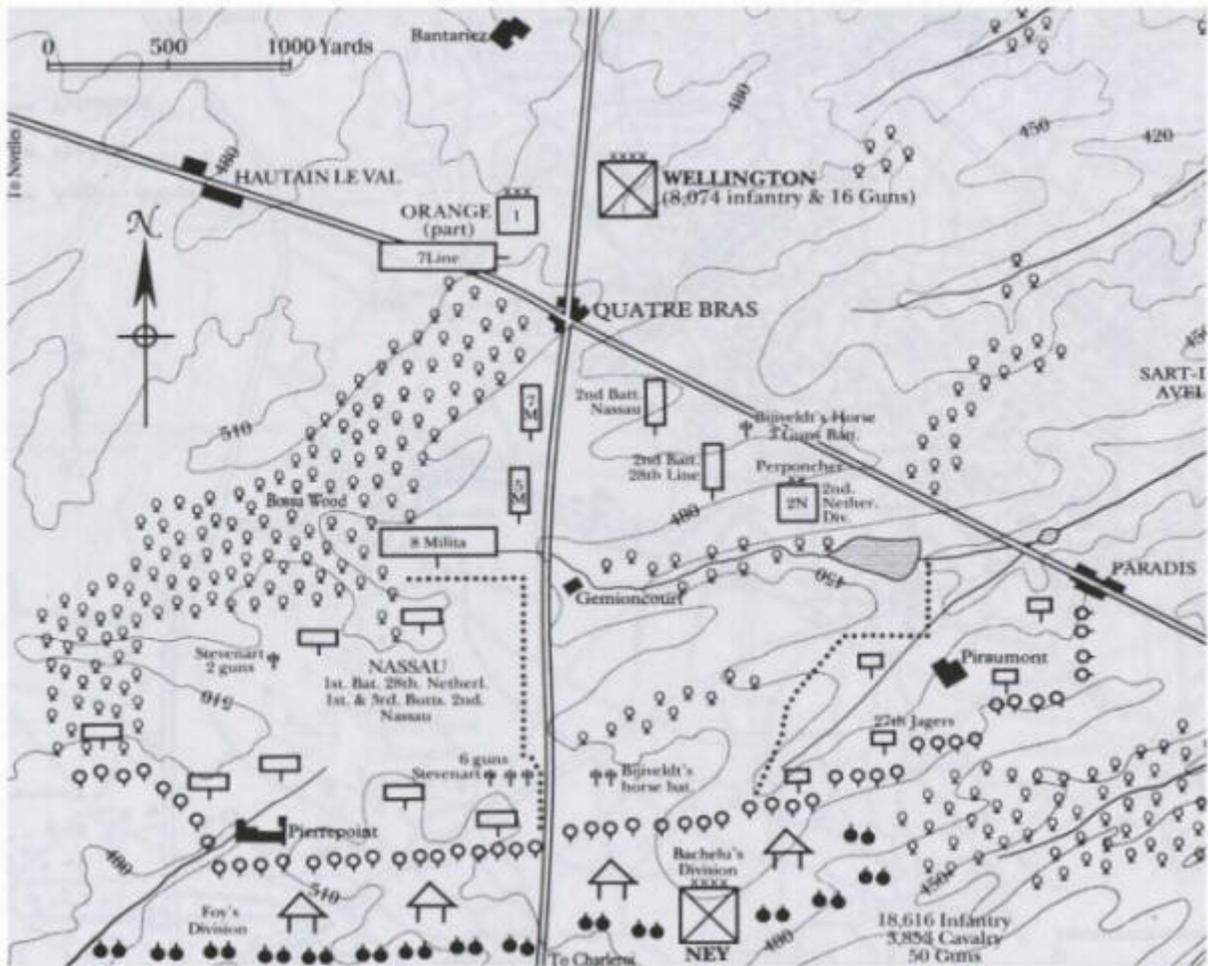


Boundary between 137th and 138th Infantry



### STUDENT NOTE:

Use the map in the following page to strategically place the unit symbols according to the topography of the military map against the enemy symbols.



**REFERENCE:**

Map Reading and Land Navigation, FM 3-25.26

Army Field Manual 21-26 Map Reading and Land Navigation

Guidebook for Marines 18<sup>th</sup> edition

UNITED STATES MARINE CORPS  
Field Medical Training Battalion  
Camp Pendleton

FMSO 1204

## **M9 Service Pistol Familiarization**

### **TERMINAL LEARNING OBJECTIVES**

1. Given a tactical scenario in a combat environment, an M9 Service Pistol with magazine, individual combat equipment, and ammunition, engage targets with the M9 pistol, to meet mission requirements. (FMSO-FP-1204)
2. Given a M9 Service Pistol with magazine, and a small arms maintenance equipment case, maintain the M9 Service Pistol, to meet maintenance requirements. (FMSO-FP-1209)

### **ENABLING LEARNING OBJECTIVES**

1. Without the aid of references, given an M9 Service Pistol, a loaded magazine and the necessary equipment at an approved pistol range, fire the M9 Service Pistol without safety violations, per the student handout. (FMSO-FP-1204a)
2. Without the aid of reference and given a description or title, identify the characteristics of the M9 Service Pistol, per the student handout. (FMSO-FP-1209a)
3. Without the aid of references, given a description, identify the parts of the M9 Service Pistol, per student handout. (FMSO-FP-1209b)
4. Without the aid of reference, given a description, identify the safety features of the M9 Service Pistol, per the student handout. (FMSO-FP-1209c)
5. Without the aid of references, given a description or title, identify the weapons conditions of the M9 Service Pistol, per student handout. (FMSO-FP-1209d)
6. Without the aid of references, given a description or title, identify the four (4) safety rules for the M9 Service Pistol, per the student handout. (FMSO-FP-1209e)

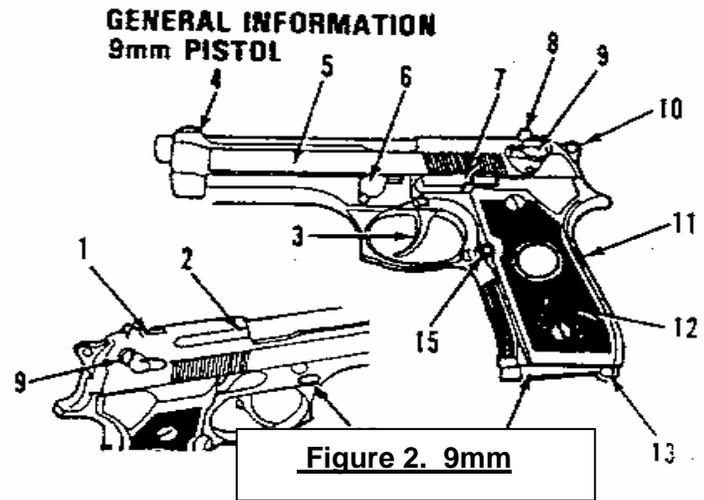
1. **DESCRIPTION** - The M9, 9mm pistol is a semi-automatic, magazine-fed, recoil-operated, double-action weapon, chambered for the 9mm cartridge.
2. **CHARACTERISTICS** - The characteristics of the M9, 9mm pistol are as follows:
  - a. Weight with full magazine: 2.54 lbs.
  - b. Weight with empty magazine: 2.12 lbs.
  - c. Magazine capacity: 15 rounds
  - d. Maximum range: 1,800 meters
  - e. Maximum effective range: 50 meters
  - f. Trigger-pull, single action: 4 to 6.5 lbs.
  - g. Trigger-pull, double action: 7.5 to 16.5 lbs.
3. **THE FOUR SAFETY RULES:**
  - a. Treat every weapon as if it were loaded
  - b. Never point a weapon at anything you do not intend to shoot
  - c. Keep your finger straight and off the trigger until you are ready to fire
  - d. Keep the weapon on safe until you intend to fire
4. **SAFETY FEATURES** (See fig. 1)
  - a. **Firing pin block** - Physically blocks movement of the firing pin unless the trigger is held to the rear, raising the block out of the way.
  - b. **Ambidextrous Safety** - Lowers the hammer when applied without the danger of discharging the weapon. Rotates the firing pin striker out of alignment with the firing pin so that no force can be accidentally applied to the firing pin. The hammer cannot be cocked with the safety in the "SAFE" position.
  - c. **Half-cock Notch** - Stops the hammer from accidentally falling fully forward should the full-cock notch be stripped. Also catches the hammer should the cocking cycle be interrupted in the double-action fire mode.
  - d. **Extractor/loaded chamber indicator**- When a round is in the chamber, the head of the extractor projects out from the surface of the slide, indicating a loaded weapon.



**Figure 1. Safety Features**

## 5. NOMENCLATURE

- a. See Figure 2
  - (1) Firing pin block
  - (2) Extractor/loaded Chamber indicator
  - (3) Trigger
  - (4) Front sight
  - (5) Slide assembly
  - (6) Disassembly lever
  - (7) Slide stop
  - (8) Rear sight
  - (9) Ambidextrous safety
  - (10) Hammer
  - (11) Receiver
  - (12) Grip
  - (13) Lanyard loop
  - (14) Magazine (seated)
  - (15) Magazine catch assembly
  - (16) Disassembly button



## 6. WEAPON CONDITIONS

### a. Condition Four

- (1) Magazine Removed
- (2) Chamber Empty
- (3) Slide forward
- (4) Weapon on safe

### b. Condition Three

- (1) Magazine Inserted
- (2) Chamber Empty
- (3) Slide forward
- (4) Weapon on safe

### c. Condition Two

- (1) Not Applicable to the M9 Service Pistol

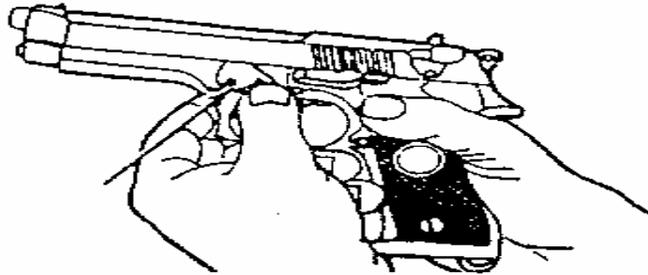
### d. Condition One

- (1) Magazine Inserted
- (2) Round in Chamber
- (3) Slide forward
- (4) Hammer down
- (5) Weapon on safe

7. **DISSASSEMBLY** - Disassembly of the M9 service pistol consists of field stripping into the four (4) main groups for operator maintenance. No tools are required, and further disassembly is not authorized for the operator. Parts are machined to close tolerances, and disassembly must be carried out in the prescribed manner to prevent damage to the weapon.

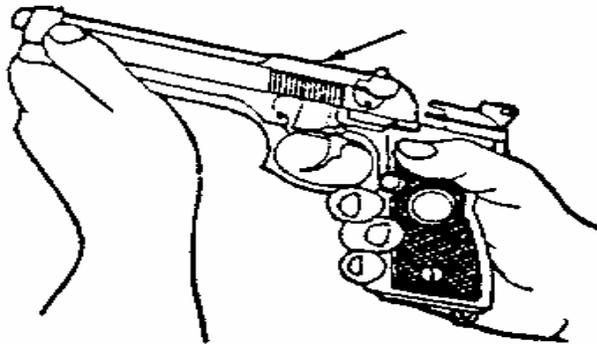
- a. The first step in disassembly is to *ensure the weapon is clear!* Then allow the slide to travel forward by depressing the slide stop.

- b. With the pistol in the right hand and the muzzle slightly elevated, use the left hand to depress the disassembly lever release button and rotate the disassembly lever downward until it stops (See fig. 3).



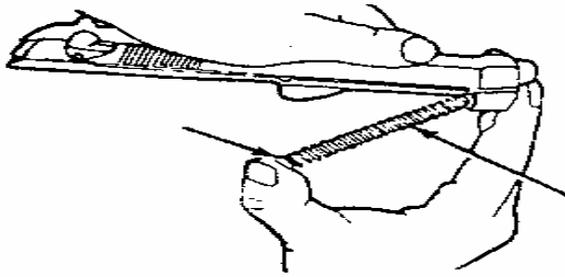
**Figure 3. Rotation of Disassembly Lever Release Button**

- c. Pull the slide and barrel assembly forward and remove (See fig 4)



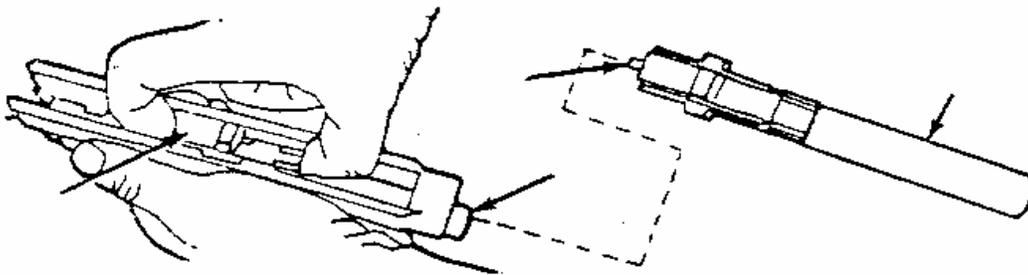
**Figure 4. Removal of Slide and Barrel Assembly**

- d. Compress the recoil spring and spring guide, and lift and remove it from the slide and barrel (See fig. 5)



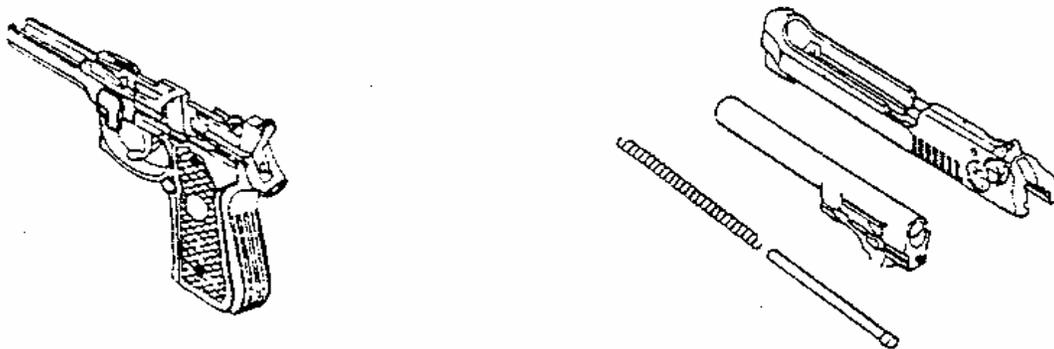
**Figure 5. Removal of Recoil Spring from Spring Guide**

- e. Separate the recoil spring from the spring guide.
- f. Push in on the locking block plunger while pushing the barrel forward slightly. Lift and remove the locking/barrel assembly from the slide (See fig. 6)



**Figure 6. Removal of Locking Barrel Assembly from Slide**

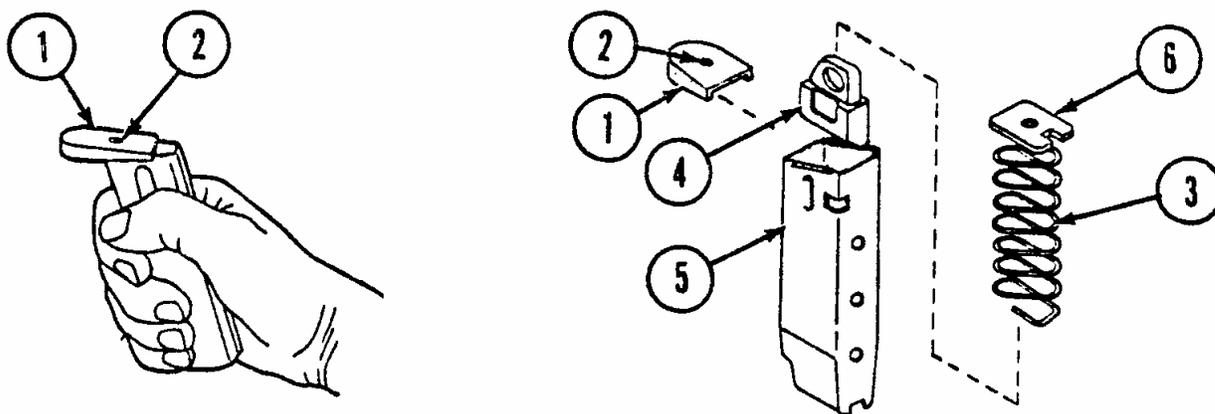
- g. This completes general disassembly or fieldstripping. Notice that the weapon is disassembled into four (4) groups. These are the four (4) main groups of the weapon: the (a) locking block/barrel group, (b) the slide group, (c) the recoil spring and spring guide group, and (d) the receiver group. (See fig. 7)



**Figure 7. M9 Main Groups.**

8. **DISASSEMBLY OF THE MAGAZINE** (See fig. 8)

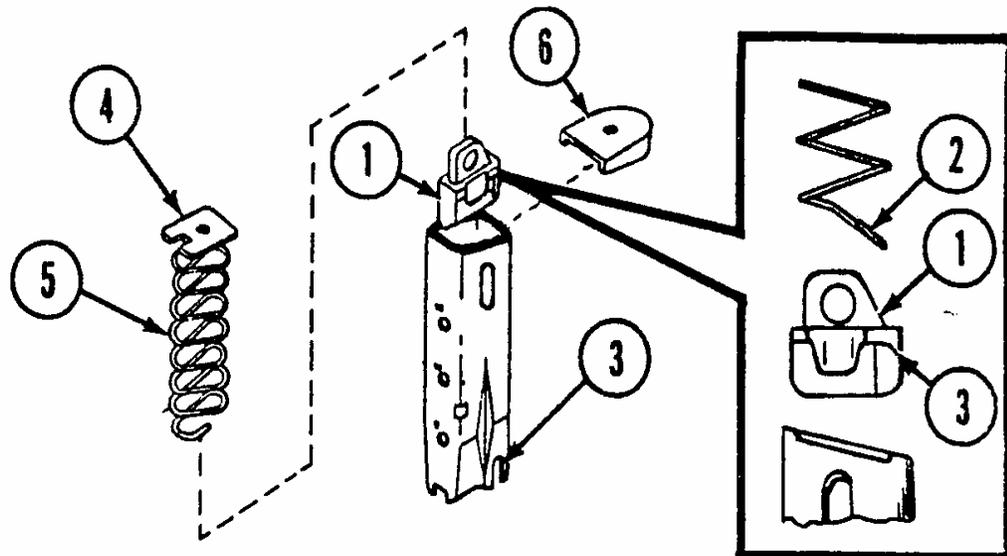
- a. Unload the magazine
- b. Grasp the magazine firmly with the bottom plate up and the back of the magazine tube against the palm of the hand.
- c. Release the bottom plate (1) by pushing down on the bottom plate retainer stud (2) in the center of the bottom plate (1). To remove the bottom plate, use the barrel locking block plunger or a cleaning rod. At the same time, slide the bottom plate (1) forward for a short distance using the thumb.
- d. While maintaining pressure on the magazine spring, remove the bottom plate (1) from the magazine.
- e. Remove the bottom plate retainer, magazine spring (3), and follower (4) from the magazine tube (5). Remove the bottom plate retainer (6) from the magazine spring (3)
- f. Inspect – Check the spring and the follower for damage. Ensure that the lips of the magazine are not excessively bent and are free of cracks and burrs. The magazine tube should not be bent or dirty.



**Figure 8. Disassembly of the Magazine**

9. **CLEANING AND INSPECTION** - Cleaning will be conducted with the weapon field stripped. The recommended cleaning agent is CLP (Cleaning, lubricate, protective). During the cleaning process do not allow the hammer to fall when the slide is removed. Always manually lower the hammer when the slide is removed.
- a. **Slide Group** - Clean with cloth, the All Purpose (AP) brush, and CLP. Remove all excess dirt and carbon. Ensure the breech face, slide grooves, safety, and extractor are free of dirt and residue.
  - b. **Locking block / barrel group** - Always clean the barrel from the chamber end first. Use a bore brush to loosen deposits and then swab with a cleaning patch and CLP. Continue this process

- until a clean patch no longer picks up deposits or residue. Clean the locking block with the AP brush.
- c. **Recoil spring and spring guide** - Use the AP brush, cloth, and CLP. Be careful not to stretch, bend, or crimp the spring.
  - d. **Receiver group** - Use cloth and the AP brush with CLP to clean. Pay special attention to the disassembly lever, trigger, slide stop, hammer, and magazine release button.
  - e. **Magazine** - Wipe off the magazine tube and the follower with a cloth. Clean the magazine tube and follower with CLP and an All-purpose brush. With a cloth, wipe the magazine spring, bottom plate retainer, and bottom plate clean. Apply a light coat of CLP.
10. **REASSEMBLY** - As with most small arms, reassembly of the M9 is the reverse of disassembly.
- a. First, replace the barrel by placing it in the inverted slide, muzzle end first, and then dropping the locking block end into place.
  - b. Insert the recoil spring guide into the recoil spring. Then replace the assembly in the bottom of the slide by placing the spring into the recoil spring housing and compressing it until the spring guide will fully seat into the locking block cut out.
  - c. Line up the rear of the slide with the front of the receiver guide rails and push the slide and barrel assembly until the rear of the slide is slightly past the rear of the receiver.
  - d. Rotate the disassembly latch upward until it clicks in place.
11. **ASSEMBLY OF THE MAGAZINE** (See fig. 9)
- a. Insert the follower (1) into the top coil (2) of the magazine spring. The top coil has an upward and forward pointing end. Ensure that the notches (3) on the follower and magazine tube are on the same side.
  - b. Insert the magazine spring with the follower into the magazine tube. Turn the magazine bottom up with the backside against the palm of your hand.
  - c. Attach and center the bottom plate of the spring coil.
    - (1) After insertion, you must maintain spring tension with your thumb. Do not place the lips of the magazine tube on a hard surface during reassembly
  - d. Push and hold the magazine spring (5) and the bottom plate retainer (4) down. At the same time, slide the bottom plate (6) over the sidewalls until it is fully seated. This will be indicated by a click.



**Figure 9. Assembly of the Magazine**

## 12. WEAPONS COMMANDS

- a. **Load** - Takes the weapon from condition 4 to condition 3.
- b. **Make ready**-Takes the weapon from condition 3 to condition 1.
- c. **Fire** - Engage target(s).
- d. **Cease-fire** - Cease target engagement.
- e. **Unload** - Take the weapon from any condition, to condition 4.

## REFERENCE

Pistol Marksmanship MCRP 3-01B

**UNITED STATES MARINE CORPS  
FIELD MEDICAL TRAINING BATTALION  
Camp Pendleton, Ca**

**FMSO 1205**

**Identify NBC Preventive Measures**

**TERMINAL LEARNING OBJECTIVES**

1. Given the NBC Personal Protective Equipment, identify NBC preventative measures to wear the gear and equipment effectively per the references. (FMSO-FP-1205)

**ENABLING LEARNING OBJECTIVES**

1. Without the aid of reference, given a description or list, identify the NBC alarm to meet mission requirements per FMFM 11-2. (FMSO-FP-1205a).

2. Without the aid of reference, given a description or list, identify the components of the M40A1 Field Protective Mask to ensure serviceability per TM 3-4240-279-10. (FMSO-FP-1205b).

3. Without the aid of reference, given a description or list, identify the accessories of M40A1 Field Protective Mask to ensure serviceability per TM 3-4240-279-10. (FMSO-FP-1205c).

4. Without the aid of reference, given a description or list, identify the procedure on how to use the drinking system of the M40A1 Field Protective Mask to ensure serviceability per TM 3-4240-279-10. (FMSO-FP-1205d).

5. Without the aid of reference, given an M40A1 Field Protective Mask and exposure to an irritant gas in a gas chamber or simulated combat environment, don and clear the gas mask in nine seconds or less per FMFM 11-2. (FMSO-FP-1205e).

6. Without the aid of reference, given a description or list, identify the cleaning procedures for the M40A1 Field Protective Mask to ensure proper donning and clearing in 9 seconds or less per FMFM 11-2. (FMSO-FP-1205f).

7. Without the aid of reference, given a description or list, identify the limitations of Mission-Oriented Protective Posture (MOPP) to meet mission requirements per FMFM 11-2. (FMSO-FP-1205g).

8. Without the aid of reference, given a description or list, identify the levels of Mission-Oriented Protective Posture (MOPP) to meet mission requirements per MCWP 3-37.3. (FMSO-FP-1205h).

9. With the aid of reference, exchange MOPP gear to meet mission requirements per MCWP 3-37.3 NBC Decontamination (FM3-5). (FMSO-FP-1205i).

## **INTRODUCTION:**

The M-40 FPM is used to protect the individual's face, eyes and lungs against field concentration of chemical and biological (CB) agents, toxins and radioactive fallout particles. The M40 FPM will not protect the wearer against industrial gases such as ammonia or carbon monoxide. It is not effective in confined spaces, where the oxygen content of the air is low. The M40 FPM comes in three (3) sizes: small, medium and large. The size mark is located on the top left portion of the mask.

### **1. COMPONENTS AND MAINTENANCE OF THE M-40 FPM**

- a. When you receive a FPM you should inspect the following components for serviceability (See fig. 1)

- (1) Face-piece Assembly

- (a) Made of silicone rubber with in-turn peripheral face seal and binocular rigid lens system.
- (b) Visually inspect for holes, tears, splits, soft and sticky parts.

- (2) Head Harness - Visually inspect for the following:

- (a) Secures and attaches the face piece to the wearers head.
- (b) Visually inspect for dirt, cuts, tears, fraying, loss of elasticity and missing parts on straps

- (3) Eye-lenses, Eye-rings and Out-serts -

- (a) Provides protection to the wearer's eyes.
- (b) Inspect the outsert for cracks, cuts, scratches, distortion or corrosion and discoloration that will affect vision.

- (4) Hood

- (a) Provides head, neck and mask face blank protection against liquid chemical agents.

(b) Examine the hood for cuts, holes or tears. Make sure the straps do not have frays, tears, or missing hardware. Also check the zipper for broken and inoperative parts.

(5) Canister

(a) Air-filtering medium and can be mounted on the left or right side of the face piece, so that a weapon can be shouldered. Right handed shooters will normally locate the canister on the left side of the mask or vice versa.

(b) Check that air intake is not clogged with dirt

(c) Inspect the threads on the canister and the seams for cracks, dents and holes.

(d) Visible water damage, any moisture will render the canister unserviceable

(6) Outlet Valve Disk and Outlet Valve Cover

(a) Outlet valve disk releases exhaled air and prevents unfiltered air from entering the face piece.

(b) Remove any dirt or moisture, rotate outlet valve disc to make sure it is not sticking and inspect for cuts, tears and holes.

(c) Outlet valve disk is present and is not curled or distorted

(7) Internal/External Drink Tubes

(a) Allows wearer to drink in a contaminated environment or for donning mask in long periods of time.

(b) Tubes are not clogged by connecting M1 canteen cap and blowing air through system

(8) Airflow Deflector

(a) The airflow deflector is securely mounted inside face-piece

(b) Inspect mounting holes for cuts or tears

(9) Inlet Valve

(a) Inlet valve disk allows filtered air to enter the face piece and prevents moist exhaled air from entering the canister. Inlet valve to ensure it is properly mounted on post

(b) Inspect inlet valves for cuts, holes, or tears and make sure it is not stucked to the valve body.

(10) Nose-cup Assembly

- (a) The nose cup valve disk allows filtered air to enter the nose cup and prevents moist exhaled air from fogging eye lenses in cold weather.
- (b) Inspect nose-cup for cracks or holes, ensure the nose-cup is not pulled away from the back of the front voice-meter housing and the nose-cup valve disks are present Rotate disks to make sure they are not stuck, curled, or torn

(11) Voice-meter

- (a) Transmit you voice outside of the facepiece.
- (b) Inspect voice-meter for bends, cracks, or punctures
- (c) The beads in the center of each voice-meter should be facing outward

(12) Carrier

- (a) Provides space for storage of the mask and authorized accerssories.
- (b) Inspect for torn, damaged, or missing hardware
- (c) Mildew, solvents, or abrasive materials that may harm the face-piece

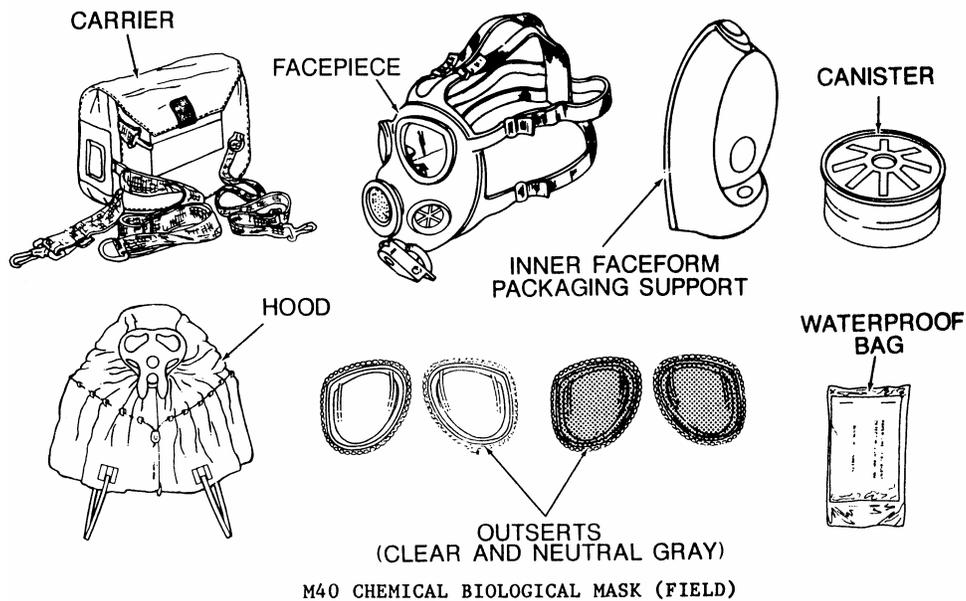
(13) Waterproof Bag

- (a) Inspect for cracks, tears, holes, or brittleness, rubber bands are not sticky.

(14) Optical Inserts

- (a) Inspect for broken lenses or frame (if issued)

(15) Face form - Maintains mask shape



1-0

Figure 1. Components of the M-40 FPM

## **2. ACCESSORIES OF THE M40 FPM**

a. When you receive a FPM you should inspect the following accessories for serviceability.

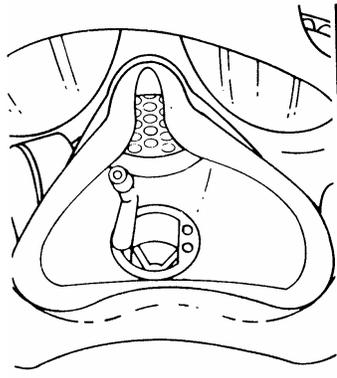
- (1) M1 canteen cap
- (2) M291 decontaminating kit
- (3) Optical inserts

## **3. M40 FPM DRINKING SYSTEM PROCEDURES**

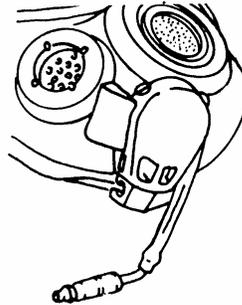
a. Prior to using the drinking system, use M8 chemical agent detector paper to check for contamination. If contamination is detected, decontaminate the drinking tube and the M1 canteen cap with the M291 decontamination kit. After decontamination, recheck the surfaces with M8 chemical agent detector paper.

b. By pressing in on the top of the outlet valve, the internal drinking tube can be grasped between your teeth (See fig. 3a)

c. Pull the quick connect coupling out of the outlet valve cover (See fig. 3b)



**Figure 3a**

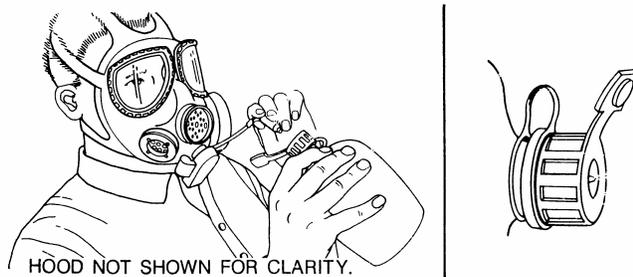


**Figure 3b**

d. Remove the cap cover from the canteen cap (decontaminate if necessary)

e. With the canteen right side up, insert the quick connect coupling into the M1 canteen cap and blow air into the drinking system to create positive pressure within the canteen (See fig. 4)

f. Raise and invert the canteen and begin drinking water



**Figure 4**

#### 4. **MASKING PROCEDURE**

a. When the verbal or visual signal sign for an NBC attack has been given, you must follow these procedures in a time limit of 9 seconds without hood or 15 seconds with hood or risk becoming contaminated.

- (1) Stop breathing and close your eyes.
- (2) Open carrier and grab the face-piece. The mask is stored with the head harness pulled over the front of the mask.
- (3) Place your chin in chin-pocket of the face-piece.
- (4) Clear the field protective mask.
- (5) Cover the outlet valve with the palm of one (1) hand.
- (6) Exhale sharply so that the air escapes around the edges of the face-piece.
- (7) Cover the air inlet port of the canister with the palm of your free hand, and breath in. The face piece should collapse against your face and remain there while holding your breath. If the face piece collapses consider it airtight.
- (8) Grasp the tab and tighten straps and adjust. Make sure the square harness patch is centered in the rear of your head.

#### 5. **CLEANING THE M-40 FPM**

(1) Wash the mask anytime it needs cleaning. A white or rust colored waxy film is not dirt, it is from the preservatives built in the rubber. It will bleed off as long as the face-piece is good.

(2) Required materials: soft cloths, soft bristle brushes, warm soapy water, and warm clear water.

(3) Procedural Steps:

- (a) Remove the canister by unscrewing it from mask.
- (b) Dip clean, soft cloth in warm soapy water and wring it out. Wash mask inside and out. Wash voice-meter, outlet valve cover, and inlet valve assemblies. Be careful with rubber disks.
- (c) Rinse cloth in clear, warm water and wring it out. Wipe all washed parts.
- (d) Dry all parts and mask with dry, soft cloth. Use brush in hard to get areas.
- (e) Replace parts taken off. Make sure rubber disks are snug and flat. Clean the lenses using polish or warm, soapy water.

## **6. LIMITATIONS OF MISSION-ORIENTED PROTECTIVE POSTURE**

a. MOPP is a flexible system of protection against chemical agents, which is used in chemical warfare to facilitate mission accomplishment. Because of body heat buildup and basic human needs, the over garment can't be worn for an indefinite period. MOPP however, gives the commander and staff a range of choices of levels of chemical protection for their units, from no protection at all to full protection.

(1) Heat Exhaustion- Individuals working at a heavy work rate, while in protective gear, may experience heat exhaustion (dizziness and fainting) at any time, especially during periods of high temperatures.

(2) Work Rate- Consideration of such factors as mask breathing resistance, increase in body temperature from work energy, solar heat and psychological and physiological stress.

(3) Five Senses- Involving the senses or related functions such as manual dexterity, visual acuity and voice communication will operate at varying decreased levels of efficiency.

(4) Personal Needs- Individuals can be in full chemical protection for indefinite periods and still attend to certain personal needs such as caring for wounds, personal hygiene, sleep and elimination of body waste.

(5) Eating- The ability of troops to eat in an NBC environment depends on the type and extent of contamination. Some of the available options are as follows:

(a) If the troops are in a contaminated area, move them into a collective protection Facility.

(b) Postpone meals until a clean area is reached.

## **7. LEVELS OF MISSION-ORIENTED PROTECTIVE POSTURE**

a. MOPP Level 1 - This level of protection is established when the *general warning* is given and the threat of NBC warfare exists.

(1) Over garment is worn open or closed

(2) Over boots are carried

(3) Mask is carried

(4) Gloves are carried

b. MOPP Level 2 - This level of protection should be established during tactical situation that requires units to cross-terrain where the previous use of chemical agents is unknown.

- (1) Over garment is worn open or closed
- (2) Over boots are worn
- (3) Mask is carried
- (4) Gloves are carried

c. MOPP Level 3 - This level of protection should be established when units are on the move and a chemical attack is possible.

- (1) Over garment is worn and closed
- (2) Over boots are worn
- (3) Mask and hood are worn; hood is open or closed, based on temperature
- (d) Gloves are carried

d. MOPP Level 4 - This level of protection should be established when a unit will be operating within an area of contamination, or if there is an imminent threat of attack.

- (1) Over garment is worn and closed
- (b) Over boots are worn
- (c) Mask and hood are worn and closed
- (d) Gloves are worn



**UNITED STATES MARINE CORPS**  
FIELD MEDICAL TRAINING BATTALION  
TRAINING COMMAND  
BOX 21010  
Camp Pendleton, CA 92055-1010

**SERVICE CARBINE FAMILIARIZATION**

**TERMINAL LEARNING OBJECTIVES.**

Given a scenario in a tactical environment, a service carbine, magazine, ammunition and cleaning equipment, maintain the service carbine and using the 4 safety rules, engage targets with the service carbine, to display the ability to protect yourself and your patients from aggressive acts, per the reference. (FMSO-FP-1210)

**ENABLING LEARNING OBJECTIVES.**

1. Without the aid of reference, given a list of choices, identify the characteristics of the service carbine, within 80 percent accuracy, per MCRP 3-01A. (FMSO-FP-1210a)
2. Without the aid of reference, given a list of choices, identify the four safety rules for the service carbine, within 80 percent accuracy, per MCRP 3-01A. (FMSO-FP-1210b)
3. Without the aid of reference, given a list of choices, identify the weapon conditions for the service carbine, within 80 percent accuracy, per MCRP 3-01A. (FMSO-FP-1210c)
4. Without the aid of reference, given a list of choices, identify the components of the service carbine, within 80 percent accuracy, per MCRP 3-01A. (FMSO-FP-1210d)
5. Without the aid of reference, given a list of choices, identify the safety features of the service carbine, within 80 percent accuracy, per MCRP 3-01A. (FMSO-FP-1210e)
6. Without the aid of reference, given a service carbine, disassemble the service carbine, to 100 percent accuracy, per MCRP 3-01A. (FMSO-FP-1210f)
7. Without the aid of reference, given a service carbine, maintain the service carbine, in order to operate a functional weapon, per MCRP 3-01A. (FMSO-FP-1210g)
8. Without the aid of reference, given a service carbine, assemble the service carbine, to 100 percent accuracy, per MCRP 3-01A. (FMSO-FP-1210h)

9. Without the aid of reference, given a list of choices, describe the procedures to perform a function check of the service carbine, within 100 percent accuracy, per MCRP 3-01A. (FMSO-FP-1210i)
10. Without the aid of reference, given a service carbine, a magazine, ammunition, and necessary equipment at an approved range, load and unload the service carbine without safety violations, per MCRP 3-01A. (FMSO-FP-1210j)
11. Without the aid of reference, given a service carbine, a loaded magazine and the necessary equipment at an approved range, fire the service carbine without safety violations, per MCRP 3-01A. (FMSO-FP-1210k)

## 1. CHARACTERISTICS

- a. The M4 Carbine is a 5.56mm, magazine-fed, gas-operated, air-cooled, shoulder-fired weapon that can be fired either in automatic three-round bursts or semiautomatic single shots as determined by the position of the selector lever.
- b. Caliber - 5.56mm
- c. Weight - with 30 round magazine 7.5 pounds
- d. Length - Extended Stock with compensator 33 inches, collapsed stock, 29.75 inches,
- e. Rifling - RH 1 / 7 twist.
- f. Muzzle velocity - approximately 2,900 feet per second
- g. Chamber pressure - 52,000 PSI
- h. Cyclic rate of fire - approximately 700-900 rounds per minute
- i. Maximum effective rates of fire
  - (1) Semiautomatic - 45 rounds per minute
  - (2) Burst: - 90 rounds per minute
  - (3) Sustained rate of fire - 12 to 15 rounds per minute
- j. Maximum effective range:
  - (1) Individual/point targets - 500 meters
  - (2) Area targets - 800 meters
- k. Maximum range - 3600 meters

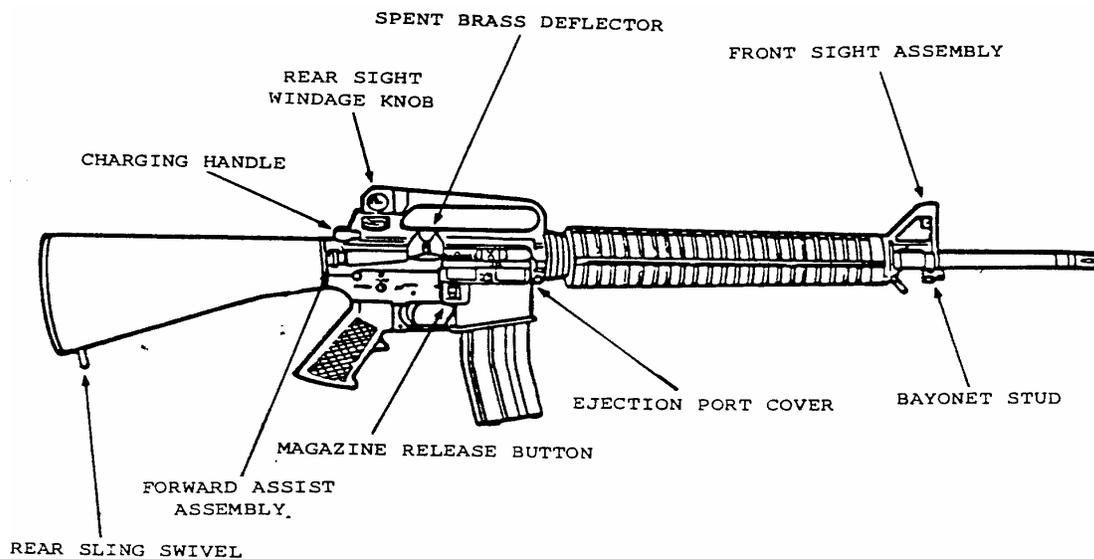
## 2. FIREARMS SAFETY RULES

- a. Treat every weapon as if it were loaded

- b. Never point a weapon at anything you do not intend to shoot
- c. Keep your finger straight and off the trigger until you are ready to fire
- d. Keep the weapon on safe until you intend to fire

### 3. NOMENCLATURE

- 4. Before taking your rifle apart, you need to know the nomenclature (that is, the names) of all externally visible parts. Using your own rifle, find and learn the nomenclature of all outside parts. Then, as you disassemble the rifle, learn the nomenclature of all internal parts.



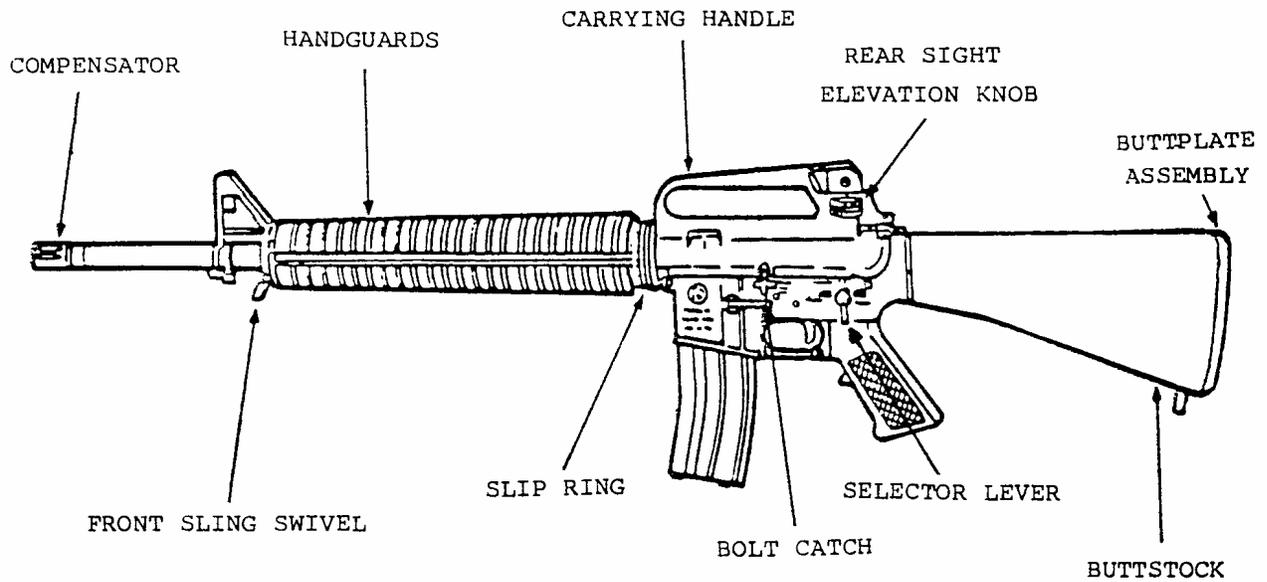


Figure 1. Nomenclature

5. WEAPON CARRYING CONDITIONS

a. Condition Four

- (1) Magazine removed
- (2) Chamber empty
- (3) Bolt forward
- (4) Ejection port cover closed
- (5) Weapon is on safe

b. Condition Three

- (1) Magazine inserted
- (2) Chamber is empty
- (3) Bolt forward
- (4) Ejection port cover is closed
- (5) Weapon is on safe

c. Condition Two - Not applicable for the M-4

d. Condition One

- (1) Magazine inserted
- (2) Round in the chamber
- (3) Bolt is forward
- (4) Ejection port cover is closed
- (5) Weapon is on safe

## 6. SAFETY FEATURES AND DISASSEMBLY OF THE M4 CARBINE

a. Clearing the M4 Carbine (Safety Features/Precautions)

- (1) Before you can disassemble the rifle, you must ensure that the weapon is on safe. (See fig. 2)

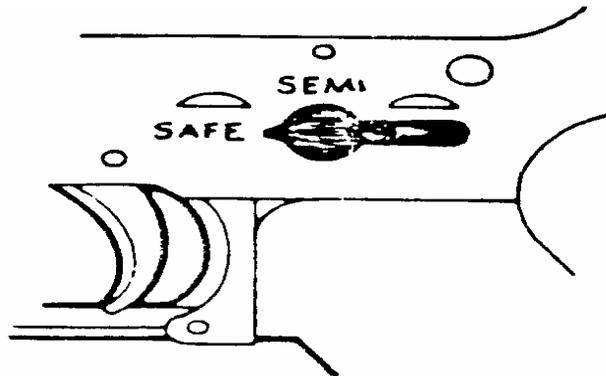


Figure 2. Selector Switch On Safe

- (2) Attempt to point the selector lever to safe. If the weapon is not cocked, the selector lever cannot be pointed to safe
- (3) Remove the magazine from the weapon by grasping it with the right hand, depressing the magazine release button with the thumb. Pull the magazine straight down to remove it from the weapon. (See fig. 3)

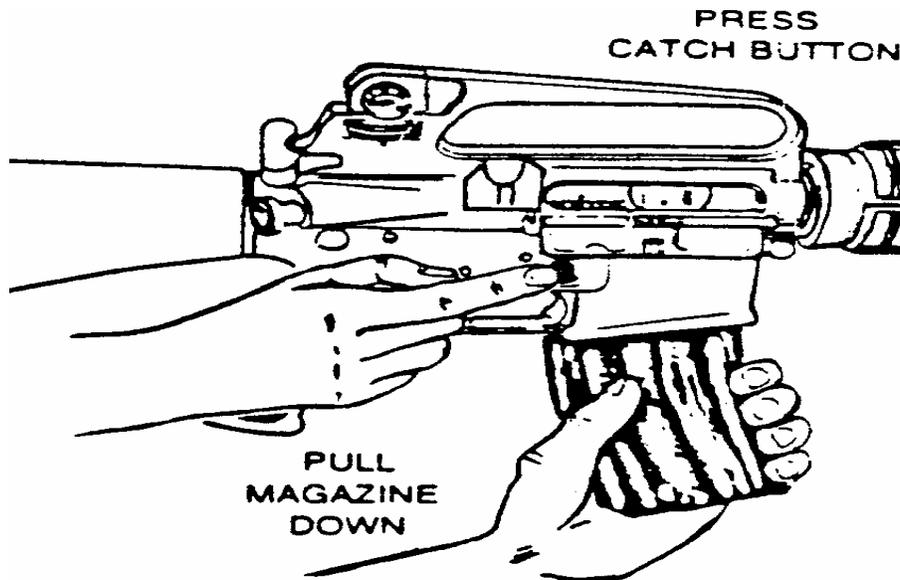


Figure 3. REMOVING THE MAGAZINE

- (4) Lock the bolt carrier to the rear by grasping the charging handle and depress the charging handle latch pulling the charging handle all the way to the rear; press in on the bottom on the bolt catch with the thumb or forefinger. Allow the bolt carrier to move slowly forward until the bolt engages the bolt catch. Return the charging handle to its forward position
  - (5) Inspect the receiver and chamber by looking through the ejection port to ensure that these areas do not contain ammunition
  - (6) Check the selector lever to ensure that it points safe. The rifle is clear and safe, only when
    - (a) There is no round in the chamber
    - (b) The magazine is out
    - (c) The bolt carrier is locked to the rear
    - (d) The selector lever is in the safe position
- b. Disassembly - When the weapon is cleared, you can disassemble the weapon by doing the following:
- (1) Allow the bolt carrier to go forward by depressing the upper portion of the bolt catch
  - (2) Remove the sling and place the rifle on the table or a flat surface, muzzle to the left, weapon on the right side

- (3) Remove the hand guards
  - (a) Place the butt of the weapon against a flat surface and pull down on the slip ring until the lower lip of one hand guard is clear
  - (b) Pull out and down on the hand guard until the upper lip is cleared of the hand guard cap
  - (c) Repeat the same operation to remove the other side of the hand guard. Considerable pressure is required to remove the hand guard from the slip ring
- (4) Detach the Upper Receiver from the Lower receiver
  - (a) Press out the take down pin from left to right until the upper receiver swings free of the lower receiver
  - (b) Press out the receiver pivot pin
  - (c) Separate the upper and lower receiver groups
  - (d) Place the lower receiver group on the table
- (5) Removing the Charging Handle and the Bolt Carrier Group
  - (a) Hold the upper receiver group with the muzzle and carrying handle up. Grasp the charging handle
  - (b) Depress the charging handle
  - (c) Latch and pull the charging handle three inches to the rear to withdraw the bolt carrier from the receiver  
(See fig. 4)

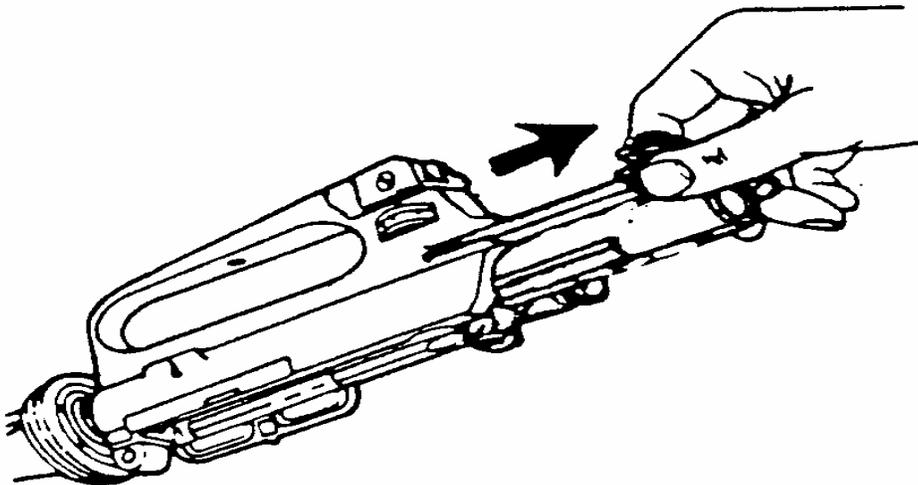


Figure 4. REMOVING THE BOLT CARRIER

- (d) Grasp the bolt carrier and pull it out from the receiver. When the bolt carrier is removed, the

charging handle can be removed from its groove in the receiver

- (e) Place the upper receiver on the table
- (6) Disassemble the bolt carrier group (See fig. 5)
  - (a) Press out the firing retaining pin from right to left
  - (b) Elevate the front of the bolt carrier and allow the firing pin to drop free from its recess in the bolt
  - (c) Rotate the bolt until the cam pin is clear of the bolt carrier key and remove the cam pin by rotating the head 90 degrees (1/4 turn) in either direction. Lift out of well in the bolt and bolt carrier
  - (d) After the cam pin is removed, the bolt can be removed from its recess in the bolt carrier. This completes disassembly of the bolt carrier group.

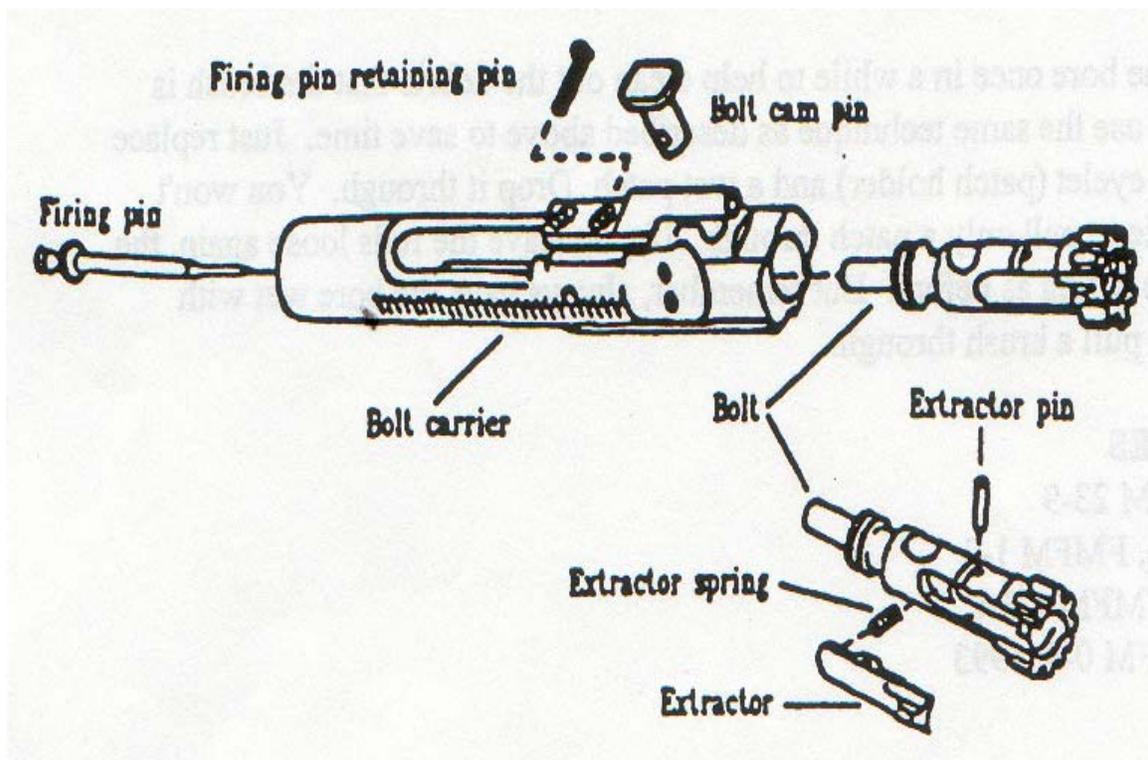


Figure 5. BOLT CARRIER GROUP

(7) Remove buffer assembly

- (a) Push down on the buffer retainer. Allow the buffer assembly to move forward slowly until it is clear of the buffer retainer
- (b) Depress the hammer to the rear (downward) to allow the buffer assembly to clear the hammer
- (c) Remove the buffer assembly and the action spring

7. MAJOR PARTS OF AN M4 CARBINE

a. Lower Receiver Group

- (1) Stock
- (2) Bolt catch
- (3) Rubber recoil Pad
- (4) Rear sling swivel
- (5) Selector lever
- (6) Pistol grip
- (7) Trigger guard
- (8) Trigger
- (9) Magazine release button

b. Upper Receiver Group

- (1) Front sight assembly flash suppressor
- (2) Rear sight drum (elevation knob, windage knob)
- (3) Ejection port
- (4) Upper sling swivel
- (5) Hand guards
- (6) Carrying handle
- (7) Bayonet stud
- (8) Forward assist
- (9) Barrel
- (10) Slip rings

c. Bolt Carrier Group

- (1) Firing pin
- (2) Bolt carrier
- (3) Firing pin retainer pin
- (4) Cam pin
- (5) Bolt
- (6) Extractor
- (7) Extractor retainer pin

**8. CLEANING AND LUBRICATION OF THE M4 CARBINE**

Normal care and cleaning will result in proper functioning of all parts of the weapon. Improper maintenance causes stoppages and malfunctions. Only "issue" type cleaning materials should be used. These cleaning materials are carried by the rifleman in the compartment provided in the stock of the weapon. Do not use any abrasive material to clean the rifle. Cleaner Lubricant and Preservative (CLP) is the only authorized lubricant for the M4 Carbine.

a. Cleaning And Lubrication Of The Upper Receiver

- (1) Clean the upper receiver until free of powder.
- (2) After cleaning, coat the interior surfaces of the upper receiver with CLP. Pay particular attention to shiny surfaces, which indicate areas of friction

b. Cleaning And Lubrication Of The Barrel

- (1) Attach a bore brush to the cleaning rod, dip it in CLP, and brush the bore thoroughly
- (2) Brush from the chamber to the muzzle using straight-through strokes
- (3) Push the brush through the bore until it extends beyond the muzzle compensator
- (4) Continue this process until the bore is free of carbon and fouling  
(Never reverse the direction of the brush while in the bore).
- (5) Remove the brush from the cleaning rod and dry the bore with clean patches
- (6) DO NOT attempt to retract the patch until it has been pushed all the way out of the muzzle compensator

**CAUTION:** The cleaning rod is to be supported by hand, one section at a time, to prevent flexing and damage to the bore.

c. Cleaning the Chamber

- (1) Attach the chamber-cleaning brush to a section of the cleaning rod
- (2) Dip it in CLP, and insert it in the chamber
- (3) Scrub in a circular motion
- (4) Remove the brush and dry the chamber thoroughly with clean patches
- (5) Clean the locking lugs in the barrel extension, using a small bristle brush dipped in CLP to remove all carbon deposits
- (6) Clean the protruding exterior of the gas tube in the receiver with the bore brush attached to a section of the cleaning rod
- (7) After cleaning, lubricate the bore and locking lugs in the barrel extension by applying a light coat of CLP to prevent corrosion and pitting. If the hand guards have been removed, rub a light coat of CLP on the surface of the barrel
- (8) Place one or two drops of CLP on the front sight post

d. Cleaning And Lubrication Of The Bolt Carrier Group

- (1) Thoroughly clean all parts with a patch or an all-purpose brush dipped in CLP
- (2) Clean the locking lugs of the bolt, using an all purpose brush and CLP
- (3) Ensure that all carbon and metal filings are removed; then wipe it clean with dry patches and lubricate lightly
- (4) Use an All Purpose brush dipped in CLP to scrub the extractor to remove carbon and metal filings
- (5) Also clean the firing pin recess and the firing pin
- (6) When dry and before final assembly, apply a coat of CLP to the bolt body, rings and carrier key
- (7) When bolt carrier group is reassembled apply a liberal amount of CLP to all exterior surfaces with particular emphasis to the friction points (i.e., rails and cam area). PUT ONE DROP OF CLP IN THE CAM PIN TRACK AND TWO DROPS IN THE GAS PORTS

e. Cleaning And Lubrication Of The Lower Receiver Group

- (1) Wipe any particles of dirt from the trigger mechanism

with a clean patch or brush and place a drop of CLP on each of the pins for lubrication

- (2) Components of the lower receiver group can be cleaned with CLP and a brush
- (3) Use a scrubbing action to remove all carbon residue and foreign material and then drain the CLP from lower receiver and wipe dry

f. Cleaning And Lubrication Of The Magazine

- (1) Disassemble the magazine, being careful not to stretch or bend the spring
- (2) Scrub the inside of the magazine with a bristle brush dipped in CLP and then wipe it dry.
- (3) The magazine is made of aluminum and does not need any lubrication.
- (4) Scrub the spring clean of any foreign material using all-purpose brush dipped in CLP
- (5) Wipe dry and apply a very light coat of CLP to the spring

9. **ASSEMBLY OF THE M4 Carbine.**

a. Lower Receiver Group Assembly

- (1) Press hammer to the rear (downward)
- (2) Insert the buffer assembly into the recess in the stock of the weapon
- (3) Depress the buffer retainer so that the buffer assembly will insert into the recess completely
- (4) Release the pin so the buffer assembly is locked into place
- (5) Set the bolt carrier group down on the table

b. Bolt Carrier Group Assembly

- (1) Insert the bolt through the front end of the carrier with the extractor facing at the 11 o'clock position
- (2) Insert the cam pin into the carrier and rotate it  $\frac{1}{4}$  turn
- (3) Insert the firing pin through the rear of the carrier and let it drop into the recess for the firing pin
- (4) Insert the firing pin retainer pin into the carrier from left to right

(5) Set the bolt carrier group down on the table

c. Upper Receiver Group and Charging Handle Assembly

(1) Replace the charging handle by placing the charging handle inside the upper receiver. This is done by lining up the grooves on the charging handle with the slots in the upper receiver and pushing it in about one inch

(2) Then insert the bolt carrier group, with the carrier key resting in the charging handle, into the upper receiver, until they lock into place

d. Assembly of Major Parts

(1) Align the upper receiver with the lower receiver together and push in the pivot and take down pins to lock the receivers together

(2) Insert the top of each hand guard cap and pull down on the slip ring so the bottom lip of the hand guard will slip in and be locked in place when you release the slip ring

(3) Lock the bolt to the rear by pulling on the charging handle and depressing the bolt catch and letting the carrier go forward slowly until the bolt catch engages the bolt carrier group

(4) Return the Charging Handle to the original position. Place the selector level on safe

(5) Replace the sling on the weapon

10. **FUNCTION CHECK:**

a. A function check of the rifle consists of checking the operation of the rifle while the selector lever is in each position; SAFE, SEMI, and BURST

(1) Pull charging handle to the rear and release

(2) Place selector lever on SAFE

(3) Pull trigger - Hammer should not fall

(4) Place selector lever on SEMI

(5) Pull trigger and hold to the rear - Hammer should fall

(6) Pull charging handle to the rear and release

(7) Release trigger and pull to the rear again - Hammer should fall

b. Place selector lever on BURST

- (1) Pull charging handle to the rear and release
- (2) Pull trigger and hold to the rear - Hammer should fall
- (3) Pull charging handle to the rear three times and release
- (4) Release trigger and pull again - Hammer should fall

**REFERENCES**

Rifle Marksmanship MCRP 3-01A

TM 9-1005-319-10

**UNITED STATES MARINE CORPS**  
**FIELD MEDICAL TRAINING BATTALION**  
**CAMP PENDLETON**  
**FMSO 1401**

**ASSESSING AND MANAGING CHEMICAL AGENT CASUALTIES**

**LEARNING OBJECTIVES.**

**TERMINAL LEARNING OBJECTIVE**

1) Given a chemical warfare agent casualty in a combat environment and standard field medical equipment and supplies, manage chemical agent casualties, to prevent further injury or death.  
(FMSO-HSS-1401)

**ENABLING LEARNING OBJECTIVES**

- 1) Without the aid of reference, state the definition of chemical warfare agents to an 80 percent accuracy, per MCWP 3-37.1.
- 2) Without the aid of reference, identify characteristics of nerve agents to an 80 percent accuracy per MCWP 3-37.2.
- 3) Without the aid of reference, identify characteristics of blister agents to an 80 percent accuracy, per MCRP 4-11.1A.
- 4) Without the aid of reference, identify characteristics of blood agents to an 80 percent accuracy, per MCRP 4-11.1A.
- 5) Without the aid of reference, identify characteristics of choking agents to an 80 percent accuracy, per MCRP 4-11.1A.
- 6) Without the aid of reference, identify characteristics of military chemical compounds to an 80 percent accuracy, per MCRP 4-11.1A.
- (7) Without the aid of reference, identify characteristics of incapacitating agents to an 80 percent accuracy, per MCRP 4-11.1A.
- (8) Without the aid of reference, identify characteristics of standard CBRN NATO markers to an 80 percent accuracy, per MCWP 3-37.2.

## HISTORY

- A. The use of chemical weapons dates from at least 423 B.C. when allies of Sparta used sulfur fumes during the Peloponnesian War.
- B. World War I, German units released Chlorine and Mustard Gas which caused several thousand casualties and deaths at Ypres Belgium.
- C. During World War II, Germany utilized cyanide gas and other chemical agents in its concentration camps.
- C. Widely publicized reports of Iraqi use of chemical agents against Iran during the 1980's led to a United Nations investigation that confirmed the use of Sulfur Mustard (HD) and Sarin (GB).
- D. During Operation Desert Storm, the United States destroyed several Iraqi chemical stockpiles both in air and on land. Since Operation Desert Storm congress has passed a bill mandating the destruction of all U.S. chemical agents.

1. **CHEMICAL WARFARE (CW)** - The use of chemical agents in military operations to kill, seriously injure or incapacitate personnel through physiological effects. They can be dispersed by missiles, rockets, bombs, mines, spray tanks or artillery rounds.

### **TYPES OF CHEMICAL WARFARE AGENTS:**

2. **NERVE AGENT CHARACTERISTICS** - Nerve agents are the most toxic chemical warfare agents, potentially causing effects within seconds and death within minutes. All nerve agents are liquids with the nonpersistent agents (G series) being volatile enough to be a vapor hazard. Even though the V series agents are primarily considered contact hazards; they are at least twice as potent as GB, and even a minute amount of airborne material is extremely hazardous. MOPP IV is required for protection against all nerve agents. Table 2-1 lists the common nerve agents by their persistency.

<b>Table 2-1. Nerve Agents by Persistency</b>	
<b>NONPERSISTENT</b>	<b>PERSISTENT</b>
<b>GA</b> (Tabun) Ethyl N, N-dimethylphosphoramidocyanidate	<b>VX</b> O-Ethyl methyl Phosphonothiolate
<b>GB</b> (Sarin) Isopropyl methylphosphonofluoridate	
<b>GD</b> (Soman) Pinacolyl methyl phosphonofluoridate	<b>Vx ("V sub x")</b> O-ethyl S-(2-dimethylaminoethyl) methylphosphonothiolate
<b>GF</b> (Cyclosarin) Cyclohexyl methylphosphonofluoridate	

a. **Types of Nerve Agents**

1. **Tabun (GA)**. GA was the first of the nerve agents developed by the Germans. Because of its volatility, GA is primarily an inhalation hazard.

2. **Sarin (GB)**. GB was the second agent developed by the Germans. Pure GB is odorless and colorless. At room temperature, this agent is volatile and will begin to evaporate, causing a vapor hazard. In many cases, clothing affords minor protection, however, with GB, clothing may actually enhance the potency of liquid GB by preventing evaporation, thereby increasing the agent's effective dose.

3. **Soman (GD)**. GD, when pure, is also colorless. GD differs from other nerve agents in that the effectiveness of 2-PAM Cl is not as effective. Adequate "rescue" requires pretreatment with pyridostigmine, which will be discussed later in the lesson.

4. **Cyclosarin (GF)**. GF is both colorless and odorless liquid when pure.

5. **VX**. VX (O-ethyl methyl phosphonothiolate) is a colorless and odorless liquid when pure. VX is significantly less volatile than the other nerve agents; however, it does vaporize to some extent and is extremely potent. A significant component of airborne VX is percutaneous absorption of the vapor (vapor absorbed through the skin).

b. **Effects on the Body**. Basic life functions (such as walking or breathing) are normally carried out in a series of "contract then relax" processes. This is accomplished by a delicate balance of chemicals in the body (neurotransmitters that tell the muscle to "contract"; and enzymes which react with the neurotransmitter to allow it to "relax"). Nerve agents affect the body by inhibiting the body's ability to use an enzyme called acetylcholinesterase, causing a build up of acetylcholine. This causes uncontrollable contraction of muscles and organs. Death generally comes from either cardiac or respiratory failure.

c. **Routes of Exposure**

(1) **Vapor**. Nerve agent vapors present a respiratory hazard and can also be absorbed into the body through the eyes. In the case of some nerve agents, percutaneous absorption of the vapor is also hazardous.

(2) **Liquid**. Nerve agents can be absorbed into the body through direct contact with liquid agents (percutaneous). Liquid nerve agents can also be ingested if food and/or water are contaminated (gastrointestinal).

d. **Symptoms.** Generally, the severity and reaction time for symptoms of nerve agent exposure differ depending on the physical state of the agent (vapor or liquid) and amount of exposure. Personnel poisoned by nerve agents may experience symptoms in the following order:

1. Miosis (pinpointed pupils), runny nose, and chest tightness
2. Dim vision and headache
3. Nausea, vomiting, and cramps
4. Drooling, excessive sweating, drowsiness, and confusion
5. Difficulty breathing, twitching, jerking, and staggering
6. Convulsions, coma and death

e. **Treatment.** Casualties poisoned by nerve agents require treatment with atropine, 2-PAM chloride (2-PAM Cl), convulsant antidote for nerve agents (CANA), and possibly pyridostigmine bromide.

(1) **Atropine.** Atropine binds to receptor sites thereby blocking the excess acetylcholine caused by nerve agent poisoning.

(2) **2-PAM Cl.** This drug acts by reactivating acetylcholinesterase inhibited by a nerve agent.

(3) **CANA.** CANA prevents and treats convulsions caused by exposure to nerve agents in moderate to severe cases.

(4) **Pyridostigmine Bromide (PB).** This medicant is used as a pretreatment for exposure to GD (Soman). Unlike other G and V series nerve agents, GD attaches permanently to acetylcholinesterase. Pyridostigmine itself also inhibits the same enzyme as GD (acetylcholinesterase), however, the interaction between pyridostigmine and acetylcholinesterase is reversible.



Atropine is still needed to counteract the excess acetylcholine and 2-PAM Cl is still needed to reactivate acetylcholinesterase sites protected by the pyridostigmine. PB is distributed to military personnel in the form of nerve agent pyridostigmine pretreatment tablet sets (NAPP), which include 21 30-mg tablets. One tablet is taken every eight hours. Each NAPP tablet set provides a week of pyridostigmine pretreatment

for one Marine.

5. **First Aid.** As previously discussed in earlier periods of instruction, nerve agents are among the most toxic chemical warfare agents Marine may be exposed to in the future. We've also learned that adequate treatment (Atropine, 2PAM Cl, and CANA) can be used to negate the effects of these agents.

**Nerve Agent Antidote Kit Mk I (NAAK Mk I).** The NAAK Mk I is used to treat nerve agent exposure. The kit consists of two auto-injectors (one with 2mg of **Atropine** and another with 600mg of **2 PAM Chloride**), a plastic clip which holds the auto-injectors and a foam carrying case. Marines are issued three kits, which are usually stored inside the mask carrier.



**Convulsant Antidote for Nerve Agents (CANA).** The CANA is used to treat the convulsions associated with severe nerve agent symptoms. It consists of a single autoinjector containing 10mg of **Diazepam**. The CANA is only used for buddy aid. If you are capable of injecting yourself with a NAAK, you do not need the CANA.

6. Self-Aid. The first priority for Marines potentially exposed to nerve agents, is to prevent further exposure and mitigate the effects of any agent introduced to the body. Masking, donning protective clothing, and immediate decontamination of exposed skin, are all vital to ensuring the safety of the Marine. If exposure occurs and Marines are experiencing mild symptoms, the following self-aid procedures must be initiated without direction from superiors. First aid must occur immediately or symptoms will become more severe.

#### STUDENT NOTE

If relief is obtained from one set of NAAK Mk I injections and breathing is normal, carry on with combat duties. Dryness of mouth is a good sign, meaning that enough atropine has been administered to carry on duties. The amount of atropine administered will depend on the symptoms the casualty is exhibiting. An additional listing of mild/severe nerve agent symptoms can be found in Table 2-2 below. Giving a nerve agent casualty more than three injections may

create a nerve agent antidote overdose, which could result in incapacitation. Only medical personnel, i.e., Combat Medic/Corpsman, may administer additional atropine if symptoms persist. Additionally, ensure you use the casualty's NAAK Mk I and not your own.

\* See Appendix for First Aid, Self Aid, and Buddy Aid performance steps.

<b>Table 2-2. Symptoms of Nerve Agent Poisoning for Use in First Aid</b>	
<b>MILD Symptoms</b>	<b>SEVERE Symptoms</b>
• Unexplained runny nose	• Strange or confused behavior
• Unexplained sudden headache	• Increased wheezing and increased dyspnea (difficulty in breathing)
• Sudden drooling	• Severely pinpointed pupils
• Difficulty seeing (dimness of vision and miosis)	• Red eyes with tearing
• Tightness in the chest or difficulty breathing	• Vomiting
• Wheezing and coughing	• Severe muscular twitching and general weakness
• Localized sweating and muscular twitching in the area of contaminated skin	• Involuntary urination and defecation
• Stomach cramps	• Convulsions
• Nausea with or without vomiting	• Respiratory failure
• Tachycardia followed by bradycardia	• Bradycardia

7. **Decontamination Considerations.** Flush eyes with water immediately. Use the M291 Skin Decontamination Kit to remove any liquid nerve agent on skin or clothing. Use the M100 SDS for equipment. HTH is also effective on equipment. Water, steam, and absorbent (earth, sawdust, ashes, and rags) are effective for physical removal when the M291 kit is not available.

**Warning:** Tabun (GA) may react to form CK in bleach slurry

3. **BLISTER AGENT CHARACTERISTICS** Blister agents (vesicants) are used to produce casualties, degrade fighting efficiency, and to restrict use of terrain and equipment. As their name implies, most blister agents produce fluid-filled blisters. Death is unlikely except in extremely high doses. MOPP IV is required for protection. Vesicants can be categorized into three different groups: mustards, arsenicals and urticant.

### **TYPES OF BLISTER AGENTS**

a. **Mustards** Because of their physical properties, mustards are persistent under cool conditions; however, evaporation increases as the temperature increases. It is possible to increase their persistency even more by dissolving them in thickeners. Eyes and respiratory tract are the most sensitive target organs. Ocular effects (eyes) appear in a shorter period of time after exposure, and are more debilitating than respiratory effects.

Both liquid and vapor mustard agent rapidly penetrate the skin. Warm, moist areas with thin skin (external genitalia, underarms, inside elbow, and neck) are much more sensitive than other areas. Sweaty skin absorbs more mustard than dry skin. See Table 3-1 for a listing of mustard agents.

<b>Table 3-1. Blister Agents (Mustards)</b>	
<b>HD</b>	Distilled Mustard
<b>H</b>	Levinstein Mustard
<b>HN-1</b>	Nitrogen Mustard
<b>HN-2</b>	Nitrogen Mustard
<b>HN-3</b>	Nitrogen Mustard
<b>HT</b>	Mustard-T Mixture

b. **Arsenicals** The arsenical vesicants are respiratory tract irritants and produce lung injury with sufficient exposure. The vapors are irritating to the eyes and the liquid may produce serious eye lesions. Absorption of vapor or liquid through the skin may lead to systemic intoxication or death. See Table 3-2 for a listing of arsenicals.

<b>Table 3-2. Blister Agents (Arsenicals)</b>	
<b>L</b>	Lewisite
<b>HL</b>	Mustard-Lewisite Mixture
<b>PD</b>	Phenyldichloroarsine
<b>ED</b>	Ethylidichloroarsine
<b>MD</b>	Methylidichloroarsine

c. **Urticants** Because they do not produce fluid-filled blisters, urticants, by definition, are not true vesicants. These agents produce solid lesions instead. **Phosgene oxime (CX)** is the primary urticant of military interest. CX can penetrate garments and rubber much more quickly than other agents. It affects the skin, eyes, and lungs. No other chemical agent produces such an immediately painful onset that is followed by rapid tissue necrosis.

d. **Effects on the Body.** Blister agents burn and blister the skin or any other part of the body they contact, including mucous membranes, and eyes. They damage the respiratory tract when inhaled and cause vomiting and diarrhea when ingested.

e. **Routes of Exposure.** Liquid blister agent is rapidly absorbed into the skin causing severe burns in the affected area. Vapor will cause damage to the respiratory tract, eyes and moist areas of the skin.

f. **Symptoms.** The severity of a blister agent burn is directly related to the concentration of the agent, duration of contact with exposed tissue, and the location on the body. Most blister agents are subtle in action, except for lewisite (L) and phosgene oxime (CX), which cause immediate pain on contact. Tables 3-3 and 3-4 list symptoms for blister agent exposure by vapor/liquid.

<b>Table 3-3. Symptoms of Blister Agent Exposure - VAPOR</b>	
<b>MILD</b>	<b>SEVERE</b>
• Tearing	• Marked eyelid edema
• Itchy, burning, gritty feeling in the eyes	• Possible corneal damage
• Runny nose, sneezing	• Productive cough
• Hoarseness, hacking cough	• Severe eye pain
• Erythema	• Labored breathing
	• Blistering

<b>Table 3-4. Symptoms of Blister Agent Exposure – LIQUID</b>	
<b>Eyes</b>	<ul style="list-style-type: none"> <li>• Eyes are particularly sensitive to liquid blister agent.</li> <li>• Following exposure, there will be a latent period where no symptoms occur.</li> <li>• Latent period will be from one to three hours for a heavy exposure up to twelve hours from a mild exposure.</li> <li>• After the latent period, tearing, grittiness and redness are common. Temporary blindness may occur, but is rarely permanent.</li> </ul>
<b>Skin</b>	<ul style="list-style-type: none"> <li>• Liquid blister agents produce almost no immediate symptoms on the skin, except for lewisite (L) and phosgene oxime (CX) that cause immediate pain on contact.</li> <li>• Following a latent period of six to 12 hours, blisters will form.</li> </ul>
<b>Gastrointestinal</b>	<ul style="list-style-type: none"> <li>• Liquid blister agent poisons food and water, making them unusable.</li> <li>• If ingested, liquid blister agent produces vomiting, pain, diarrhea, lesions and hemorrhaging of the gastrointestinal tract.</li> </ul>

g. **Treatment.** When exposure is suspected, time is critical. Time is critical because blister agents become “fixed” to tissue components within two minutes after direct exposure. Using the M291 Skin Decontamination Kit as soon as possible to remove agent and flushing the eyes with water will do much to prevent or lessen the physical damage from blister agent exposure. Medical treatment consists of supportive therapy, determined by the medical provider once casualties have been evacuated. Additional treatment should be provided to prevent secondary infection of blisters/lesions. There are no antidotes or treatments that negate the agent’s destructive ability.

h. **First Aid.** The only first aid available for blister agent exposure is decontamination as soon as possible.

(1) Self-Aid. Marines exposed to liquid blister agent must perform decontamination. Decontamination is most effective if performed within the first two minutes after exposure.

Step 1. Stop breathing, close your eyes, don and clear the field protective mask, and pass the alarm. The mask and protective clothing are worn continually until the “all clear” signal is given.

Step 2. Perform immediate decontamination to neutralize any liquid contamination. Use the M291 Skin Decontamination Kit for skin exposure and water from a canteen for eye decontamination. The risk of leaving vesicant in the eyes is much greater than the risk from exposure of the eyes to vesicant vapors during the short period of decontamination. Decontamination, therefore, must be performed despite the presence of vapor.

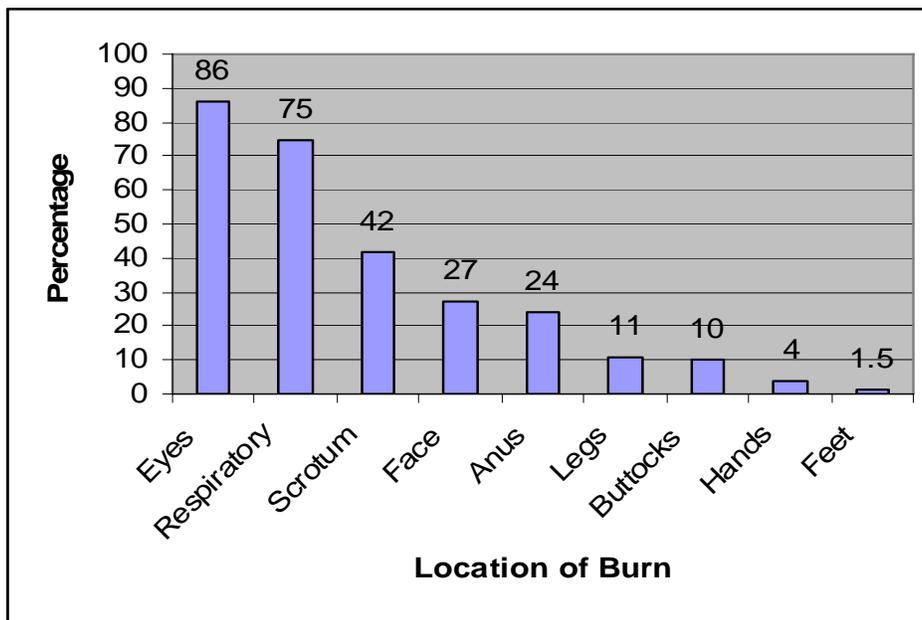


Figure 3-5. Locations of Mustard Burns among 6,980 Cases from WWI.

(2) Buddy Aid. There is no specific buddy aid for exposure to blister agents. If required, assist the buddy with masking and skin decontamination. Immediate decontamination of personnel is vital to reduce the severity of injury and number of casualties.

i. Decontamination Considerations. Flush eyes with water immediately. Use the M291 Skin Decontamination Kit to remove any liquid blister agent on skin or clothing. Use the M100 SDS for equipment. HTH is also effective on equipment. Water, soaps, detergents, steam, and absorbent (earth, sawdust, ashes, and rags) are effective for physical removal.

4. **BLOOD AGENT CHARACTERISTICS** - Blood agents are very toxic chemical warfare agents that, at high concentrations, can cause effects within seconds and death within minutes in unprotected personnel. Blood agents are highly volatile, and therefore, nonpersistent. Field protective masks with fresh filters provide adequate protection against field concentrations. Blood agents may damage field protective mask filters, therefore filters must be changed according to unit SOP and as directed by higher headquarters. Table 4-1 lists three blood agents of military significance. Table 4-2 compares the volatilities of other chemical warfare agents to the blood agent, hydrogen cyanide.

<b>Table 4-1. Blood Agents of Military Importance</b>	
<b>AC</b>	Hydrogen cyanide
<b>CK</b>	Cyanogen chloride
<b>SA</b>	Arsine

<b>Table 4-2. Comparative Volatilities of Chemical Warfare Agents</b>	
<b>Agent</b>	<b>Volatility*(mg/m<sup>3</sup>)</b>
Hydrogen Cyanide (AC)	1,000,000
Sarin (GB)	22,000
Soman (GD)	3,900
Sulfur Mustard (HD)	900
Tabun (GA)	610
VX	10
*Approximate amount of agent (in milligrams) that 1m <sup>3</sup> of air can hold at 25°C.	

- a. **Effects on the Body.** The cyanogens (AC and CK) affect bodily functions by inactivating the cytochrome oxidase system. This poisoning prevents cellular respiration and the normal transfer of oxygen from the blood to body tissues. SA causes hemolysis (breakdown) of the red blood cells. Death comes from respiratory arrest and cessation of cardiac activity.
- b. **Routes of Exposure.** Blood agents enter the body through the respiratory system. The field protective mask provides adequate protection against blood agents.
- c. **Symptoms.** Blood agents cause fewer symptoms than other chemical warfare agents. Inhalation of small amounts may cause giddiness, headache and faintness, confusion, chest pain, difficulty breathing, and ultimately unconsciousness. Symptoms specific to each of the blood agents can be found in Table 4-3.

<b>Table 4-3. Blood Agent Symptoms by Agent</b>		
<b>AC</b>	<b>CK</b>	<b>SA</b>
<ul style="list-style-type: none"> <li>• Increase in rate &amp; depth of respiration (casualty may not be able to hold his/her breath)</li> <li>• Pink color of casualty's skin</li> </ul>	<ul style="list-style-type: none"> <li>• Immediate lacrimatory effect (tearing) and irritant effect on nasal passage</li> <li>• High concentrations of CK</li> </ul>	<ul style="list-style-type: none"> <li>• Abdominal pain</li> <li>• Confusion</li> <li>• Nausea and vomiting</li> <li>• Weakness</li> </ul>

<ul style="list-style-type: none"> <li>• Respiratory arrest</li> <li>• Cessation of cardiac activity (death)</li> </ul>	produce effects similar to AC <ul style="list-style-type: none"> <li>• Lung irritation can lead to pulmonary edema</li> </ul>	<ul style="list-style-type: none"> <li>• Anemia and kidney damage</li> <li>• Exposure to liquid can cause frostbite.</li> </ul>
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d. **Treatment**. Marines exposed to blood agents will only have a short time to react before they are unable to put their mask on. Speed is essential. Antidotes to blood agent poisoning are available in the US. Medication used (sodium thiosulfate and sodium nitrite) are quite effective if administered to exposed personnel before heart failure. These drugs form compounds that have a higher affinity for cyanides, thus freeing cytochrome oxidase to resume its normal activity.

e. **First Aid**. There is no first-aid or medicants for the treatment of blood agents that can be self-administered. Marines exposed to blood agents will only have a short time to react before they are unable to put their mask on. Speed is absolutely essential.

1. **Self-Aid**. Stop breathing, close your eyes, don and clear the field protective mask, and pass the alarm. The field protective mask is worn continually until the “all clear” signal is given.

2. **Buddy Aid**. Mask the casualty and seek medical attention.

f. **Decontamination Considerations**. Move to fresh air; no decontamination necessary under field conditions

5. **CHOKING AGENT CHARACTERISTICS** - Choking agents attack the lung tissue, causing them to fill with fluid. This results in a condition known as pulmonary edema (“dry land drowning”) and can cause death due to lack of oxygen. Choking agents are nonpersistent. The field protective mask provides adequate protection against choking agents. There are two choking agents of military significance:

- a. CG (Phosgene)\*
- b. DP (Diphosgene)

*\*Only one considered likely to be used in the future.*

a. **Effects on the Body**. Choking agents cause irritation to mucus membranes (such as bronchi, trachea, larynx, pharynx and nose). These irritated tissues secrete fluid faster than the body is able to absorb the fluid.

b. **Routes of Exposure**. Choking agents are nonpersistent agents, employed in vapor form. Therefore, the primary route of exposure is inhalation.

c. **Symptoms**. The symptoms of choking agent will manifest immediately. Initial symptoms may include: tears, dry throat, coughing, choking, tightness in chest, nausea, vomiting, and headache. Lung damaging concentrations may not be detected by smell.

In extreme cases, damaged tissues swells, lungs become fluid-filled, and death results from lack of oxygen; thereby causing unprotected personnel to “choke.”

**Student Note**

The severity of exposure to choking agents cannot be estimated from immediate symptoms. Full effects may be delayed up to 72 hours after exposure.

d. **Treatment**. There is no specific treatment other than pulmonary care (oxygen) for choking agents.

e. **First Aid**. Since choking agents attack the lung tissue, it is important to note that any activity or stress after exposure to a choking agent is likely to worsen the effects, potentially turning a sub-lethal dose into a lethal exposure. There is no specific first aid required for choking agents.

(1) **Self-Aid**. Stop breathing, close your eyes, don and clear the field protective mask, and pass the alarm. The mask and protective clothing are worn continually until the “all clear” signal is given. Continue normal combat duties **unless** there is difficulty breathing, nausea, vomiting or unusual shortness of breath. Should these symptoms appear, there should be quiet rest until medical evacuation is accomplished.

(2) **Buddy Aid**. Buddy aid is not necessary, as choking agents produce no immediately lethal effects. Ensure Marines experiencing symptoms of exposure minimize their activities until medical evacuation is accomplished.

f. **Decontamination Considerations**. Skin decontamination is usually not necessary with these agents unless they are disseminated in very cold climates.

6. **MILITARY CHEMICAL COMPOUND CHARACTERISTICS** - As previously stated, military chemical compounds are less toxic than the chemical warfare agents we just discussed, and include, riot control agents (RCAs), respiratory irritant agents, smoke and obscurants, and incendiary materials. The two families of military chemical compounds we will discuss are riot control agents and respiratory irritants.

a. **Riot Control Agents (RCAs)**. These chemicals rapidly produce sensory irritation or disabling physical effects which disappear within a short time after exposure. A listing of standard tear-producing agents currently in the US inventory for RCAs can be found in table 7-1 below. They are local irritants that, in very low concentrations, act primarily on the eyes, causing intense pain and tearing. At high concentrations they irritate the respiratory tract and the skin. They can also cause nausea and vomiting. The protective mask and ordinary field clothing secured at the neck, wrists and ankles provide protection against field concentrations of RCAs.

In general, these agents cause rapid onset of effects (seconds to minutes) and have a relatively brief duration of effects (15 to 30 minutes) once the exposed subject is removed from the contaminated atmosphere and has removed the contamination from clothing.

Due to the temporary effects of their use, these agents are widely used for training, riot control, and situations where long-term incapacitation is unacceptable.

These agents have proven highly effective when used against poorly equipped combatants and noncombatants.

<b>Table 7-1. Riot Control Agents and Chemical Compound</b>	
<b>Riot Control Agents</b>	<b>Chemical</b>
CS (CS1, CS2, CSX)	O-Chlorobenzylidene malononitrile
CR	Dibenz (b,f)-1:4-oxazepine
OC	Capsaicin (oleoresin capsicum)

(1) CS. The US adopted CS (o-chlorobenzylidene malononitrile) for combat training and riot control purposes in 1959. CS produces an intense burning and irritation of the eyes, with mild to severe conjunctivitis. It also produces a burning sensation in the nose and mucous membranes of the respiratory tract, followed by draining of the nasal sinuses. The chest feels constricted, with a sensation of choking and being unable to breathe. CS is also a skin irritant, and is capable of causing erythema, edema, and in some cases vesication (blistering). Table 7-2 details the clinical effects caused by exposure to field concentrations of RCAs.

CS exists as a family of four forms: CS, CS1, CS2, and CSX. Different forms of CS have different persistency characteristics because of varying formulation, dissemination, and rate of hydrolysis (reaction with water causing decomposition/breakdown of the agent). CS has been found to persist in snow for as long as 30 days but its persistency in soil varies, depending on the condition of the soil.

(2) CR. The US approved the use of CR (dibenz (b,f)-1:4-oxazepine) in 1974 for use in riot control situations. CR is both more potent and less toxic than CS. The severity of symptoms increases with the CR concentration and in any environment that is high in temperature and humidity. CR does not degrade in water, and is persistent in the environment, persisting for up to 60 days under suitable conditions.

(3) OC. Capsaicin (OC) is an agent derived from cayenne peppers. OC stimulates sensory nerve endings, causing reflex changes in blood pressure and respiration. It causes pain, edema (swelling), and erythema (redness) of the tissues with which it makes contact, including airway mucosa. As OC is a powerful irritant and lacrimator, contact with the eyes is extremely painful.

**Table 7-2. Clinical Effects of Riot Control Agents**

<b>Eye</b> <ul style="list-style-type: none"> <li>• Burning, irritation</li> <li>• Conjunctival injection</li> <li>• Tearing</li> <li>• Blepharospasm</li> <li>• Photophobia</li> </ul>	<b>Airways</b> <ul style="list-style-type: none"> <li>• Sneezing</li> <li>• Tightness in the chest</li> <li>• Irritation</li> <li>• Secretions</li> </ul>
<b>Skin</b> <ul style="list-style-type: none"> <li>• Burning</li> <li>• Erythema</li> </ul>	<b>Nose</b> <ul style="list-style-type: none"> <li>• Rhinorrhea</li> <li>• Burning pain</li> </ul>
<b>Gastrointestinal Tract</b> <ul style="list-style-type: none"> <li>• Gagging</li> <li>• Retching</li> <li>• Vomiting</li> </ul>	<b>Mouth</b> <ul style="list-style-type: none"> <li>• Burning of mucous membranes</li> <li>• Salivation</li> </ul>

(4) First Aid for RCAs

(a) Self-Aid. Marines who are experiencing mild symptoms will be capable of performing self-aid but will require observation to ensure they don't progress into more severe symptoms.

Step 1. Stop breathing, close your eyes, don and clear the field protective mask, and pass the alarm.

Step 2. Keep your eyes open as much as possible, and move out of the contaminated area.

Step 3. When it is safe to do so, remove your mask and blot away tears. **DO NOT** rub eyes. If drops have entered the eyes, flush with large amounts of water. See STUDENT NOTE below.

(b) Buddy Aid for RCAs. There is no buddy aid for riot control agents.

(5) Decontamination Considerations Use soap and water on skin and equipment contaminated with CS, CS1, or CS2.

7. **INCAPACITATING AGENT CHARACTERISTICS**- Incapacitation, in a military context, is defined as the inability to perform one's mission (or military task) effectively. Incapacitating agents differ from other chemical warfare agents in that the lethal dose is theoretically many times greater than the incapacitating dose. Typically, these agents do not seriously endanger life and cause no permanent injury.

a. **Effects on the Body.** Incapacitating agents interfere with the higher functions of the brain such as attention, orientation, perception, memory, motivation, conceptual thinking, planning and judgment. Virtually all drugs capable of producing psychological or behavioral effects can be classified as an incapacitating agent. These agents can also be grouped into four discrete categories: deliriant, stimulants, depressants, and psychedelics. During this period of instruction, we will only cover one incapacitating agent.

Since BZ (3-Quinuclidinyl benzilate) is considered the most likely candidate for military use, this deliriant will be the only incapacitating agent discussed. As their name suggests, these agents produce delirium, which is an incapacitating syndrome (group of symptoms) involving confusion, hallucinosis, and disorganized speech and behavior.

Specific qualities of BZ include the following:

- a. BZ is capable of producing delirium at very low concentration with a high safety margin.
- b. Skin absorption is possible with proper solvents.
- c. Full recovery from BZ requires two to three days.

b. **Routes of Exposure.** Incapacitating agents may be disseminated as a liquid or a gas, depending on agent and solvents used. MOPP IV is required to protect against incapacitating agents.

c. **Symptoms.** Small doses of BZ cause sleepiness and diminished alertness. Exposure to field concentrations of BZ may result in the following symptoms:

- a. Restlessness, dizziness, or giddiness
- b. Failure to obey orders, confusion, erratic behaviors
- c. Stumbling or staggering
- d. Vomiting
- e. Dryness of mouth
- f. Tachycardia (rapid heart rate) at rest
- g. Elevated body temperature
- h. Flushed face
- i. Blurred vision
- j. Slurred or nonsensical speech
- k. Hallucinatory behavior
- l. Stupor
- m. Coma

d. **Treatment.** Generally, specific medical treatment is not necessary in instances of exposure to incapacitating agents. Subjects exposed to BZ however, can be treated with the drug physostigmine.

e. **First Aid.** First aid for incapacitating agents generally consists of close observation, supportive care with fluids, and (when required) restraint and confinement. Weapons and all other potentially harmful items should also be removed from affected personnel, to include cigarettes, matches, medications, and small items that might be accidentally eaten by the casualty.

(1) Self-Aid

Step 1. Stop breathing, close your eyes, don and clear the field protective mask, and pass the alarm. The mask and protective clothing are worn continually until the “all clear” signal is given.

Step 2. Perform immediate decontamination to neutralize any liquid contamination.

(2) Buddy Aid

Step 1. Immediately mask any casualty that does not have a mask on if the atmosphere is (or may still be) contaminated.

Step 2. Remove or neutralize any liquid contamination with the M291 Skin Decontamination Kit.

Step 3. Closely monitor casualty with regards to first aid measures mentioned. If the casualty is stuporous or comatose, be sure that breathing is unobstructed; turn the casualty on one side to avoid aspiration in case vomiting should occur. Monitor body temperature as well, as BZ may cause a significant rise in body temperature (similar to heat stroke).

f. **Decontamination Considerations.** Decontaminate with soap and water or use M291 Skin Decontamination Kit if soap and water are not available.

## **8. CHARACTERISTICS OF STANDARD NATO CBRN CONTAMINATION MARKERS**

a. Throughout NATO, the signs used for marking CBRN contaminated areas are standardized in color, shape and size. This permits easy identification, and allows for universal understanding of where contamination on the battlefield is located.

The color of the sign indicates the type of hazard, i.e. chemical, biological or radiological.

b. CBRN contamination markers are triangle shaped.

The base (top edge) is approximately 11½ inches (28 centimeters) and the sides are approximately eight inches (20 centimeters).

The sign is always placed with the base of the triangle facing up.

c. The signs can be made of wood, plastic, metal, or any other available material.

d. There are four standard NATO CBRN contamination markers: chemical; biological; radiological; and chemical minefield (unexploded mines).

(1) Chemical Contamination Marker: The chemical contamination marker has a **YELLOW** background with **RED** lettering that spells “**GAS**”.

(2) Biological Contamination Marker: The biological contamination marker has a **BLUE** background with **RED** lettering that spells “**BIO**”.

(3) Radiological Contamination Marker: The radiological contamination marker has a **WHITE** background with **BLACK** lettering that spells “**ATOM**”.



## **REFERENCES**

1. MCWP 3-37.1 Weapons of Mass Destruction
2. MCRP 4-11.1A Treatment of Chemical Agent Casualties and Conventional Military Injuries

**UNITED STATES MARINE CORPS  
FIELD MEDICAL TRAINING BATTALION  
CAMP PENDLETON**

**FMSO 1402**

**ASSESSING AND MANAGING BIOLOGICAL AGENT CASUALTIES**

**LEARNING OBJECTIVES**

**TERMINAL LEARNING OBJECTIVE**

1) Given a biological warfare agent casualty in a combat environment with standard field medical equipment and CBRN Personal Protective Equipment, assess, and identify injuries and initiate appropriate treatment for biological agents reducing the risk of complications, further injury, or death, per the references. (FMSO-HSS-1402)

**ENABLING LEARNING OBJECTIVES**

- 1) Without the aid of reference state the U.S. policy on biological warfare to an 80 percent accuracy, per MCWP 3-37.1B.
- 2) Without the aid of reference state the definition of a biological warfare agent to an 80 percent accuracy, per FM 8-9.
- 3) Without the aid of reference identify characteristics of biological warfare agent attacks, to an 80 percent accuracy per FM 8-9.
- 4) Without the aid of reference identify ways that biological warfare agents are disseminated to an 80 percent accuracy, per FM 8-9
- 5) Without the aid of reference identify biological warfare agents of military importance and their symptoms and treatment, to an 80 percent accuracy per MCRP 4-11.1C.

## **1. UNITED STATES BIOLOGICAL WARFARE POLICY**

a. **United States policy on Biological Warfare** – President Nixon established the current United States policy that unconditionally renounces all methods of biological warfare on 25 November 1969. President Nixon restricted the United States biological weapons program to defensive research such as immunization. He directed the Department of Defense to devise a plan to dispose of existing stocks of biological agents and weapons.

On 14 February 1970, the United States banned toxin weapons. By 26 December 1975, the United States had completely destroyed all of its biological weapons.

2. **BIOLOGICAL WARFARE AGENT DEFINITION** The NATO definition of a biological warfare agent is; viruses, bacteria, other microorganisms, that cause death or disease in humans, animals or plants or cause the deterioration of material.

## **HISTORIC EXAMPLES OF BIOLOGICAL WARFARE**

**600 BC** – The Athenians contaminated the River Pleisthenes with skunk cabbage, giving the defenders of Kirrha violent diarrhea, which led to their defeat.

**1346** – The Tatars catapulted plague –infected bodies into Kaffa, a well fortified seaport. Ships leaving Kaffa carried plague-infested refugees (and rats) to other Mediterranean ports. A bubonic plague epidemic quickly spread throughout Europe between 1347 and 1351, killing an estimated 25 million people.

**1763** – During Indian Chief Pontiac’s Rebellion in New England, Colonel Henry Bouquet, a British Officer, proposed giving the Indians at Fort Pitt, PA, blankets used by patients infected with smallpox. An outbreak of smallpox at Fort Pitt and Fort Carillon erupted, which spread like wildfire among Native American tribes throughout the Ohio River Valley.

**1863** –During the United States civil War, the Confederates retreating in Mississippi left dead animals in wells and ponds to deny water sources to the Union troops.

**1916** – Germany’s biological warfare program during WWI featured covert operations to infect livestock with disease and contaminate animal feed to be exported to Allied forces.

**1932-1945** – Japan embarked on an aggressive biological warfare program against the Soviet Union and Mongolia in 1939, against Chinese civilians from 1940 to 1944 and against Chinese troops in 1942, the Japanese unleashed anthrax, cholera, and plague on at least eleven Chinese cities, Japan conducted biological warfare experiments in occupied Manchuria until the end of WWII. Japan’s Imperial Unit 731 used at least 3,000 prisoners of war as test subjects.

**1978** – A Bulgarian exile, Georgi Markov, was stabbed with the end of an umbrella, which inserted into his flesh a small steel pellet containing ricin. He died several days later. The incident was the first case in recent history of state-sponsored terrorism with a biological agent.

**1979** – At least 66 Soviet civilians are believed to have died from inhalation anthrax, following a mysterious explosion at the Soviet Institute of Microbiology and Virology in Sverdlovsk.

**1985** – The Dalles, Oregon- Members of the Baghwan Shree Rajnees Cult deliberately contaminated salad bars with *Salmonella typhimurium*. The subsequent outbreak investigation confirmed more than 750 cases of infection. Their goal was to incapacitate voters to prevent them from voting and thus influence the outcome of a local election.

**2001** – Currently unknown perpetrators used the US Postal Service to deliver envelopes containing anthrax spores to locations in Florida, New York City, Connecticut, New Jersey, and Washington D.C. By December 2001, twenty two cases were confirmed (11 inhalation, 11 cutaneous) with five deaths attributed to the mailing of anthrax.

3. **CHARACTERISTICS OF A BIOLOGICAL ATTACK** There are several characteristics of a biological attack that we can use to help determine whether an attack has occurred.

a. **Unusual Number of Casualties** An unexpected large number of casualties may occur during a short period of time. This includes evidence of a massive single source disease outbreak, as well as a large number of casualties relative to the number of exposed individuals.

(1) Casualties within 48-72 hours (or longer) suggest an attack with a microorganism.

(2) Casualties within minutes to hours suggest exposure to a toxin.

b. **Unusual Distribution of Casualties** Depending on the intended target, both military and civilian casualties can occur.

(1) If only military casualties are noted, then military food or water supplies may have been targeted.

(2) Casualty distribution aligned with wind direction might be an indicator of an aerosol attack.

(3) Lower attack rates among those working indoors, especially in areas with filtered air or closed ventilation systems, may also be evidence of a Biological Warfare attack.

c. **Unusual Geographic Distribution.** If casualties are noted to be restricted to one or two small areas in one large area, that may indicate a Biological Warfare attack. Certain biological agents, such as toxins, can be used most effectively on smaller targets, while others can be disseminated more efficiently over extremely large areas (anthrax spores, for example)

d. **Unusual Disease Pattern.** The disease pattern is likely to differ from those of naturally occurring epidemics. For example, except for food-borne outbreaks, disease incidence in naturally occurring epidemics usually increases over a period of weeks or months.

In a Biological Warfare attack, the increase in disease incidence may be only hours or days. Furthermore, instead of the usual peaks and troughs evident in most natural outbreaks, a steady and increasing stream of patients will be seen in a Biological Warfare attack, similar to a food poisoning outbreak.

e. **Unusual Disease Outbreak.** The occurrence of a vector-borne disease without the vector (e.g. mosquito or tick) or the occurrence of a disease that is highly unusual for the geographic area.

Higher command authorities must be notified upon the emergence of an atypical (not normal) pattern. An example would be an outbreak of Venezuelan Equine Encephalitis (VEE) in Europe where it does not naturally occur or such an outbreak during the winter (the disease requires a mosquito vector for transmission in a natural outbreak).

f. **Unusual Disease Symptom** An unusually high frequency of respiratory disease from a disease that more often occurs naturally as a skin disease (e.g. inhalation versus cutaneous anthrax; pneumonic versus bubonic plague) and vice versa.

g. **Illness in Animals and Humans.** An increased number of sick or dead animals, often of different species (e.g. horses, cows, dogs) at the same time as an increased number of human illnesses.

h. **Evidence of an Attack.** Although rare, a witness to an attack or the discovery of a likely delivery system may be further evidence of a Biological Warfare attack.

i. **“Own goals” and “Hang Fires”.** A number of initial Biological Warfare attacks may be expected to fail in this manner so one should look for unusual disease events in the opposition.

(1) An Own-goal will result in unexpected and unusual deaths thanks to a device going off too soon. An example would be, a terrorist’s bomb going off in their house while being constructed or in a car on the way to the target.

(2) A Hang Fire would be evidenced by excessive preventive action without obvious cause until intelligence is available, as the opponents have to defuse and decontaminate equipment.

j. **Medical Surveillance**. A Biological Warfare attack may be completed before a local commander is aware that the attack has taken place. The first attempt that must be made is to distinguish between a possible Biological Warfare attack and a disease outbreak of natural origin. This can only be accomplished through adequate means of medical surveillance, which is defined as the continuing scrutiny of all aspects of occurrence and spread of disease that are pertinent to effective control.

(1) Factors to be considered include the following:

- (a) Disease incidence (number who have the disease)
- (b) Expected disease incidence for the area of operations (a Biological Warfare attack would result in a higher than expected incidence).
- (c) Sudden appearance of a disease that is unusual for the area of operation.
- (d) Determination of the source of the disease (e.g. aerosol pattern, food borne illness, water borne illness, vectors, geographic pattern).

k. **Medical Indications** Sick individuals may be the only initial indication that a Biological Warfare attack has occurred.

- (a) Most early symptoms from a Biological Warfare attack will be similar to the flu.
- (b) An unusual number of cases of skin rash, jaundice, diarrhea, sore throat, pneumonia, mental abnormalities, or hemorrhaging may also be encountered.
- (c) Naturally occurring disease and illness from a Biological Warfare attack may occur simultaneously, which can further complicate the recognition of an attack.
- (d) Additional confusion may result when multiple Biological Warfare agents are used simultaneously, or if chemical and biological agents are combined in a single attack.

l. **Detectors** The Department of Defense has several biological detectors that can provide confirmation of the presence of biological agents, however most are extremely large and not employable in a tactical scenario. Additionally, these large biological detectors are designed for “detect to treat,” not detect to warn.

The US Army does have a vehicle mounted biological detection system called the Biological Integrated System (BIDS). The BIDS is a Corps level asset and limited in number. The Marine Corps is currently developing a tactical CBRN reconnaissance vehicle capable of point biological detection.

4. **DISSEMINATION OF BIOLOGICAL AGENTS.** The term “dissemination” refers to the intentional release of a biological agent in a manner that enables it to reach the portals (routes) of entry of the intended target (humans, animals, plants, etc.) in a viable and virulent state. Based on possible routes of entry, the agent’s characteristics, and the results desired, certain methods of dissemination are feasible for biological attacks.

The effectiveness of these methods is determined by both physical and environmental factors that may limit the ability of the agent to establish infection.

Dissemination methods are related to the routes of entry through which pathogens may be introduced into the body to establish infection. These routes of entry (dissemination methods) are inhalation (delivery by aerosol), percutaneous (through the skin), and oral. The fourth method of dissemination is cover dissemination.

a. **Inhalation or Aerosol Route of Entry.** The primary route of exposure to biological agents is through the respiratory tract. Delivery by aerosol is considered to be the most effective means of dissemination. Infectious disease organisms are subject to decay over time, which will vary with environmental factors and the nature of the organism.

(1) Inhalation of agents (respiratory exposure) results in deposition of infectious or toxic particles directly within the lungs, which may provide a further direct pathway into the systemic circulatory system (bloodstream) depending on the size of the droplet.

(2) Access to the circulatory system requires particles ranging from 0.5 to 5 microns in diameter.

(3) Infection by the respiratory route may induce disease at doses lower than those generally associated with naturally acquired infections by the oral route and the incubation period may be much shorter.

(4) Droplets as large as 20 microns can infect the upper respiratory tract. However, these relatively large particles are filtered by natural processes and are too large to reach the systemic circulation.

(5) Smaller sized particles are not efficiently retained by the human respiratory tract and are relatively unstable under environmental conditions.

(6) Aerosol delivery systems aim to generate invisible clouds with particles or droplets between 0.5 and 10 microns that can remain suspended for long periods.

(7) Atmospheric conditions are critical to the effective use of biological agents distributed by aerosol exposure.

(a) In general the optimal time for use of aerosolized biological weapons is during the late night and early morning, when inactivation of biological agent aerosols by ultra-violet (UV) radiation is minimal. UV will kill or breakdown most BW agents quickly.

(b) Neutral or inversion conditions are most likely to be present at these times which best allows an agent cloud to travel along the land surface.

**b. Percutaneous Route of Entry.** A second portal of entry that can be utilized for biological agent employment is the skin. Penetration of the skin can be accomplished by the bite of an arthropod vector, injection, or absorption.

(1) Arthropod Vectors. These insects are capable of transferring pathogens to man through breaks in the skin. The spread of disease by arthropod vectors to man is well established in history. Some examples of vectors and the pathogens they are capable of transmitting include:

(a) Mosquitoes: Malaria, yellow fever, dengue fever, several types of encephalitis.

(b) Flies: Typhoid fever, amoebic dysentery, African sleeping sickness.

(c) Fleas: Plague, typhus

(2) Injection. Biological agents can be injected through the skin (example: assassination of Bulgarian exile, Georgi Markov)

(3) Absorption. Some biological agents can be absorbed directly through the skin causing systemic effects. Others can be used to damage the skin itself, to provide a greater portal of entry for other agents.

c. **Oral Route of Entry.** Direct contamination of consumables, such as drinking water, foodstuffs, and medications, could be used as a means to disseminate infectious agents or toxins.

(1) This method of attack would be most suitable for sabotage activities and might be used against limited targets such as water or food supplies of a military unit or base.

(2) Filtration and chlorination significantly reduce this hazard as it pertains to water. However, survivability of the infectious agent or toxin in water is highly variable.

d. **Covert Dissemination.** Because of detection difficulties, the variety of potential agents, ways they may be employed, and small amounts required to cause infection, biological agents lend themselves well to covert or hidden operations. Sabotage is the direct application, by a person, of material to the target. It is generally covert in nature.

5. **BIOLOGICAL AGENTS OF MILITARY IMPORTANCE.** Numerous military references available will explain in detail the agents/pathogens that may be utilized as biological weapons. This class is only going to concentrate on those that the Centers for Disease Control (CDC) have identified as category “A” agents.

a. **Smallpox** - Smallpox has likely claimed more lives than any other infectious disease. In the 20<sup>th</sup> century alone, before it was eradicated by universal vaccination, smallpox killed up to 500 million people.

Vaccination programs ceased in 1980. The Soviet Union then launched a program to mass-produce the virus as a bio-weapon. Russia may still maintain a research program to produce virulent and contagious strains, supposedly as a defensive measure.

The only confirmed repositories of smallpox are at the Center for Disease Control and Prevention in Atlanta, GA and at the Institute of Virus preparations in Moscow.

While the chance of terrorists obtaining smallpox is remote, it is considered a grave bioterrorism threat because the disease is highly contagious and deadly. Both China and North Korea are suspected to have stocks.

Smallpox has no natural reservoirs other than humans. There are two clinical forms of smallpox.

**Variola Major** – the severe and most common form, with a more extensive rash and higher fever. Historically, variola major has an overall fatality rate of about 30%.

**Variola Minor** is a less common presentation of smallpox, and a much less severe disease, with death rates historically of 1% or less.

(1) **Incubation period** – 10-14 days

(2) **Symptoms** – High Fever, headache, backache, and vomiting, and of course rash (pox on the face and the arms that spreads to the trunk).

(3) **How it would be spread.** Aerosol or person-to-person. It is highly contagious. However, smallpox victims show clear signs of the disease, and anyone who was exposed to them could be vaccinated post-exposure.

(4) **Treatment.** There is no current treatment against the smallpox virus. Vaccination given 3-5 days post-exposure can prevent the disease. Only 12 million doses of vaccine remain to protect the uninfected, enough for one out of every twenty three Americans.

(5) **Vaccine.** The Vaccine exists but is currently not recommended for the general public. Stockpiles of the vaccine are being increased. No one except for military personnel has been vaccinated since 1972, and people vaccinated before then have likely lost immunity.

b. **Viral Hemorrhagic Fever (VHF).** The VHF viruses are comprised of four families of viruses. Examples include Ebola and Marburg (filoviruses), as well as Lassa and Machupo (arena viruses).

(1) **Incubation period:** Ranges from days to months.

(2) **Symptoms:** High fever, rash, low blood pressure, fatigue, hemorrhage, shock multiple organ system failure, and death being the most severe.

(3) **How it would be spread.** The primary means of delivery would most likely be by aerosol release, however secondary person-to-person transmission is also likely with some viruses. Some VHF viruses also rely on vector transmission (mosquitoes, ticks, and rodents).

(4) **Treatment:** The antiviral drug ribavirin has been used in some instances; however, this drug's usefulness has not been tested for all VHF viral infections.

(5) **Vaccine.** The only VHF vaccine currently in widespread use is the yellow fever vaccine. Other VHF vaccines are in various stages of development and testing.

c. **Anthrax** Anthrax gets its name from the Greek word for coal, anthrakis, because lesions that turn jet-black, characterize the skin form of the disease. Anthrax is naturally occurring and is acquired from animals or animal products. Animals get it from ingesting spores found in soil. The three forms; cutaneous, inhalation, and gastrointestinal, are all caused by the same bacterium. *Bacillus anthracis*.

(1) **Incubation period:** 12 hours – 5 days

(2) **Symptoms**

(a) **Cutaneous** - Skin infections resembling insect bites develop into lesions half an inch to an inch in diameter. Black scabs cover lesions. Swollen lymph nodes.

(b) **Inhalation** – Fever, chills headache, nausea, vomiting, and fluid in lungs, severe breathing difficulty, shock and respiratory failure.

(c) **Gastrointestinal** – Nausea, loss of appetite, vomiting, fever, abdominal pain, severe diarrhea, abdominal bleeding.

(3) **How it would be spread** Letters with anthrax powder will cause only isolated cases of disease, relatively few in number. Poisoning of food is difficult to achieve with anthrax and is not considered likely. Aerosol is the gravest threat. An odorless, invisible cloud of anthrax could trigger thousands of cases of inhalation anthrax, the most deadly form of the disease. A government study estimated that about 200 pounds of anthrax released upwind of Washington, D.C., could kill up to 3 million people. Making a lethal anthrax aerosol requires access to advanced biotechnology, which some experts believe is beyond the capability of most terrorists. However, groups with substantial funding and expertise could acquire the needed materials. Aum Shinrkyo, the cult infamous for releasing Sarin gas in the Tokyo subway, tried several times to disperse aerosols of anthrax.

(4) **Treatment** A variety of antibiotics can treat all three forms of the disease. Inhalation anthrax, however, progresses so quickly that, once symptoms are clear, it may be too late for drugs to prevent death.

(5) **Vaccine** The vaccine for anthrax used by the U.S. military is not currently available to the public. It is given in a series of six shots over 18 months. Annual booster injections are recommended.

d. **Plague.** There are various forms of plague; all caused by the bacteria *Yersinia pestis*. Bubonic plague, historically the most common, is transmitted from rats to humans by infected fleas. Nearly 19,000 cases were reported worldwide between 1980 and 1994. It is possible that infected insects could be used as weapons. Experts see a much greater risk in the spraying of *Yersinia pestis* in aerosols; inhaled bacteria would trigger cases of highly lethal pneumonic plague.

(1) **Incubation Period** 1-6 days

(2) **Symptoms** Fever, chills, headache, weakness, nausea, vomiting and abdominal pain, and extreme lymph node pain (bubonic), chest pain, bloody or watery sputum (pneumonic), septic shock.

(3) **How it would be spread** Vectors, aerosol, or person to person. Pneumonic plague is contagious through respiratory droplets.

(4) **Treatment.** A variety of antibiotics can treat the disease but must be given soon after symptoms appear. Antibiotics given immediately after exposure may prevent the disease.

(5) **Vaccine** No vaccine is available to the general public.

### STUDENT NOTE

Experts consider plague a Biological Warfare threat for several reasons:

1. The bacterium has been widely available for military and civilian researchers.
2. Techniques to mass produce and aerosolize plague were developed in the Soviet Union, and hundreds of former Soviet scientists may have this knowledge.
3. A small number of plague cases are likely to cause panic given the history of the disease.

e. **Tularemia** The U.S. military studied this infectious organism as a weapon in the 1950's and 1960's. The agent that causes tularemia, *Francisella tularensis*, is one of the most infectious bacteria known; inhaling as few as 10 microscopic germs can trigger disease. This disease occurs naturally in small mammals i.e., mice, squirrels, and rabbits. Human infection can result from insect bites or handling infected animals. Infected flies, ticks, or mosquitoes could intentionally be released as weapons, but direct spraying is a more likely threat.

(1) **Incubation period** 1-14 days

(2) **Symptoms** Fever, chills, headache, cough, and lethargic behavior, swollen and sore lymph nodes, skin ulcers, red and sore eyes, abdominal pain, diarrhea and vomiting, and pneumonia.

(3) **How it would be spread** Aerosol, food, or vectors. Human to human transmission has not been documented. The World Health Organization estimated that if 110 pounds of the aerosolized bacteria were sprayed over a city of five million, it could cause 250,000 casualties and kill 19,000. Respiratory failure or shock would cause most fatalities.

(4) **Treatment** Early antibiotic therapy is effective and, if started within 24 hours of exposure, may prevent disease. A variety of antibiotics available, some antibiotics may be powerless against genetically engineered strains.

(5) **Vaccine** No vaccine is available for the general public. The U.S. Food and Drug Administration are investigating a vaccine that is now available for high-risk lab workers.

f. **Botulinum Toxin** Development of the botulinum toxin as a possible weapon began 60 years ago. Terrorists have attempted to use it at least three times in Japan between 1990 and 1995. Naturally occurring botulism is food borne or occurs in wounds. It has been aerosolized for weapon use.

Botulinum Toxin is the most poisonous substance known. Experts consider it a major threat because of its lethality and relative ease of production. Botulism is the disease triggered when the toxin gets absorbed through the small intestine, lungs, or an open wound. It does not penetrate skin.

The toxin affects neurotransmitters, causing permanent nerve damage, paralysis, and when untreated, respiratory failure and death. Natural cases of botulism are rare and typically result from contamination of home-canned foods.

- (1) **Incubation period before symptoms**: Generally 12-72 hours
- (2) **Symptoms** – Nausea and vomiting occurs when bacteria are ingested; it may not appear if purified toxin is spread on food. Difficulty speaking, seeing, or swallowing, drooping eyelids, muscle weakness starting in the trunk and moving to the limbs, muscle paralysis and difficulty breathing.
- (3) **How it would be spread** Aerosol or food. The disease is not contagious
- (4) **Treatment** An antitoxin, available in the U.S. from the Centers for Disease Control and Prevention, stops progression of the disease and can prevent onset of disease following exposure.
- (5) **Vaccine** No vaccine is available for the general public. An investigational vaccine is available for the military and lab workers.

g. **DECONTAMINATION CONSIDERATIONS FOR BIOLOGICAL AGENTS.**

Guidelines for performing biological warfare casualty decontamination are very broad and general in scope. Generally speaking, patient decontamination for biological agent exposure consists of a 0.5 percent bleach solution. Specific decontaminants for a bacteria and viruses are not currently part of the military inventory, as they are either extremely costly, and in most cases, adequate weathering will reduce most biological hazards.

For example, anthrax contamination discovered in congressional buildings was fumigated with chlorine dioxide gas, in addition to other decontamination resources utilized to eradicate anthrax spore hazards. While decontamination efforts were successful, these resources do not exist in the US military inventory.

## **REFERENCES**

1. MCWP 3-37.1B - Weapons of Mass Destruction
2. MCRP 4-11.1C - Treatment of Biological Agent Casualties and Conventional Military Injuries.
3. JP 3-11 - Operations in Chemical Biological Radiological Nuclear Environment.
4. FM 8-9 - NATO Handbook on the medical aspects of NBC Defense Operations



**UNITED STATES MARINE CORPS  
FIELD MEDICAL TRAINING BATTALION  
CAMP PENDLETON  
FMSO 1403**

**ASSESSING AND MANAGING RADIATION CASUALTIES**

**LEARNING OBJECTIVES**

**TERMINAL LEARNING OBJECTIVE.** Provided with a simulated scenario where an attack utilizing CBRN weapons or agents may have occurred, and given indicators relating to the attack, identify nuclear, biological, chemical and radiological weapons effects and identify proper treatment in accordance with MCO 3400.3\_ (CBRN Defense Training), MCRP 3-0A (Unit Training Management Guide) and MCRP 3-0B (How to Conduct Training). (5700-TRG-1002)

**ENABLING LEARNING OBJECTIVES**

- (1) Without the aid of reference, state the U.S. policy on the use of nuclear weapons to an 80 percent accuracy, per MCWP 3-37.1.
- (2) Without the aid of reference, list significant events in nuclear warfare history to an 80 percent accuracy.
- (3) Without the aid of reference, state two types of nuclear reactions to an 80 percent accuracy per FM 8-9.
- (4) Without the aid of reference, state the five types of nuclear bursts to an 80 percent accuracy, per FM 8-9.
- (5) Without the aid of reference state the four effects of Nuclear Detonations to an 80 percent accuracy, per FM 8-9.
- (6) Without the aid of reference, define the terms associated with the yield of a weapon to an 80 percent accuracy, per FMFM 11-2.
- (7) Without reference, describe the four types of nuclear radiation to an 80 percent accuracy, per FM 8-9.

(8) Without reference, define the terms associated with the measurement of radiation to an 80 percent accuracy, per MCWP 3-37.2.

(9) Without reference, describe symptoms and treatment of radiation exposure to an 80 percent accuracy, per MCRP 4-11.1B.

(10) Without reference, state the unit survival measures for responding to a nuclear attack to an 80 percent accuracy, per MCWP 3-37.2.

**1. UNITED STATES POLICY ON NUCLEAR WEAPONS.** The current United States policy is to deter enemy CBRN weapons use through a strong nuclear force and conventional capabilities. These conventional capabilities include counterforce, active and passive defense, and consequence management, all of which enable United States forces to survive, fight, and win in CBRN environments.

With respect to nuclear weapons use specifically, the United States **may use** nuclear weapons to terminate a conflict or war at the lowest acceptable level of hostilities.

- a. This means the United States may use nuclear weapons first.
- b. Nuclear weapons employment by the United States is governed by guidance to the joint force commander as contained in JP 3-12, *Doctrine For Joint Nuclear Operations*, and other strategic level directives.
- c. The US remains party to treaties and international agreements that limit proliferation, testing, and possession of nuclear weapons.

## **2. SIGNIFICANT EVENTS IN NUCLEAR WARFARE HISTORY**

a. **Discovery of Radioactivity.** Henri Becquerel was born into a family of scientists. In 1896, Becquerel accidentally discovered radioactivity while investigating phosphorescence in uranium salts. Investigating the work of Wilhelm Conrad Roentgen, Becquerel wrapped a fluorescent mineral, potassium uranyl sulfate, in photographic plates and black material in preparation for an experiment requiring bright sunlight.

However, prior to actually performing the experiment, Becquerel found that the photographic plates were fully exposed. This discovery led Becquerel to investigate radioactivity, the spontaneous emission of radiation by material. In 1903 he shared the Nobel Prize in Physics with Pierre and Marie Curie "*in recognition of the extraordinary services he has rendered by his discovery of spontaneous radioactivity*".

b. **6 December 1941.** President F. D. Roosevelt approves the development of the atomic bomb. This is given the name "The Manhattan Project".

c. **16 July 1945.** The Manhattan Project is proven a success by the detonation of the first nuclear weapon at the Trinity test site near Alamogordo, New Mexico. The yield of this weapon was equivalent to 18,600 tons of TNT.

d. **25 July 1945**. President H. S. Truman gave the final approval for the use of atomic weapons against the Japanese.

e. **6 August 1945**. The first nuclear weapon to be used in war, a 9,700-pound Uranium bomb dubbed “Little Boy”, was dropped by the Enola Gay on the city of Hiroshima.

Three days later, on 9 August, the last nuclear weapon to be used in war, a 10,000-pound Plutonium bomb called “Fat Man”, was dropped on the city of Nagasaki. Total casualties and injuries estimates are shown below.

<b>Estimate of Casualties</b>	<b>Hiroshima</b>	<b>Nagasaki</b>
Pre-detonation population	350,000	195,000
Deaths	66,000	39,000
Injuries	69,000	25,000
Total casualties	135,000	64,000

f. **2 September 1945**. Japan surrenders to the allied forces aboard the USS Missouri in Tokyo Bay.

### 3. TYPES OF NUCLEAR REACTIONS

a. **Fission**. Fission is a nuclear process by which a heavy unstable nucleus is divided into two or more lighter nuclei and energized neutrons, resulting in the release of substantial amounts of energy. The materials used to produce nuclear explosions by fission are those isotopes of Uranium or Plutonium, which undergo fission most readily. These are  $^{235}\text{U}$  and  $^{239}\text{Pu}$ . As illustrated in Figure 4-1, a free neutron impacts the nucleus of a heavy, unstable atom. This results in the atom splitting into two or more atoms plus two or three free neutrons. Most importantly, though, is the release of an enormous amount of energy.

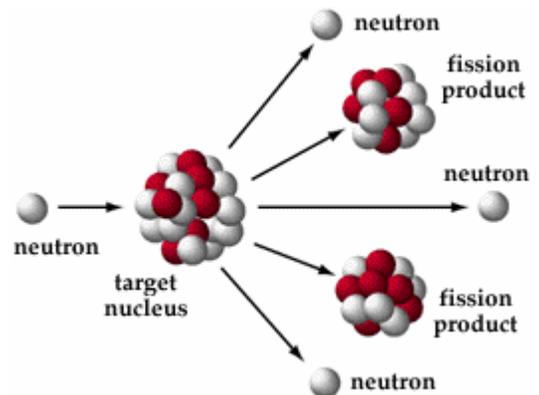


Figure 4-1: Fission

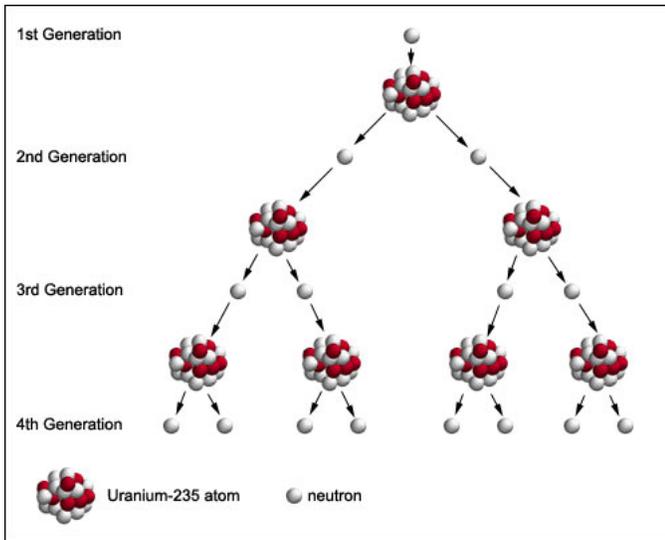


Figure 4-2: Nuclear Chain Reaction

accompanied by the release of a great deal of energy. The energy of the sun is believed to be derived from the fusion of hydrogen atoms to form helium. In nuclear fusion, a pair of light nuclei combines to form the nucleus of a heavier atom. This is generally done with two isotopes of Hydrogen, Deuterium and Tritium (see figure 4-3 below) and is also known as a hydrogen bomb. (slide 9)

Nuclear fusion can only be brought about by means of very high temperature (millions of degrees) and pressure. The only thing that will produce the heat and pressure necessary for a fusion reaction is a fission reaction. The fusion process is a clean nuclear reaction that has no radioactive byproducts and is referred to as "thermonuclear".

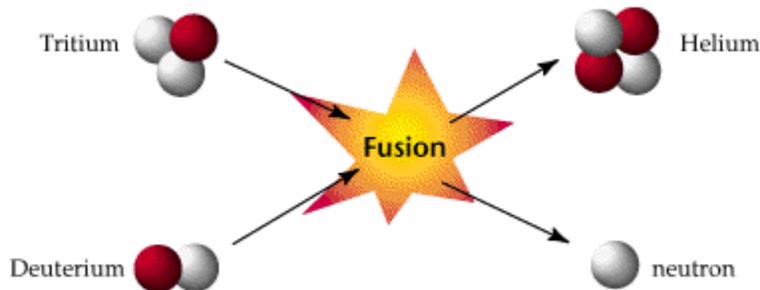


Figure 4-3: Fusion

4. **FIVE TYPES OF NUCLEAR BURSTS.** The height of any given burst will determine the type of burst. There are five different types of bursts: high air burst, low air burst, surface burst, subsurface burst, and underwater burst.

In terms of continued energy production, the most significant point about the fission process is the emission of free neutrons, which can, in turn, produce other fission events, which in turn produce still another generation of free neutrons. This phenomenon is called a **nuclear chain reaction**.

Each generation of fission-produced neutrons is capable of triggering a large number of fission reactions; and so, within a few generations, the total number of fissions produced can be monstrous. (Figure 4-2)

b. **Fusion**. Fusion is defined as the joining of atomic nuclei to form a heavier nucleus. If two nuclei of light atoms fuse, the fusion is

Student Note:

Airbursts are the most efficient type of nuclear burst for causing destruction due to the force of the explosion.

- a. **High Air Burst.** This type of burst occurs when a nuclear weapon is detonated at a height that includes damage or casualties to ground targets, such as in an air defense role. Under these circumstances, neither induced radiation nor fallout of tactical significance occurs.
- b. **Low Air Burst.** These bursts occur when a nuclear weapon produces damage or casualties on the ground, but the burst is kept above the minimum fallout safe height. Under these circumstances, only neutron-induced radiation occurs. Since this type of radiation is relatively limited in area, changes in tactical plans can normally be made to ensure that it does not grossly interfere with military operations.
- c. **Surface Burst.** When a surface burst (or near surface burst) is employed, both neutron induced radiation and fallout result, as indicated by the dark, dirty, mushroom shaped cloud (because of the dirt and debris that is drawn up into it). The fallout pattern can be expected to overlap and overshadow the entire induced radiation (*radiation produced as a result of exposure to radioactive materials, particularly the capture of neutrons.*) pattern.
- d. **Subsurface Burst.** Subsurface bursts are detonated below the surface of the earth and are capable of producing induced radiation.
- e. **Underwater Burst.** The greatest radioactive hazard from an underwater burst is emitted from the base surge. This is a misty, highly radioactive cloud of water droplets (spray), moving rapidly outwards from ground zero, for a distance of 2 to 4 miles.

Student Note

The base surge droplets evaporate, leaving behind an invisible base surge of radioactive gases and particles in the air, which continues to expand outwards and move in the downwind direction.

The length of time for which the invisible base surge remains radioactive depends on several factors including the energy yield of the explosion, the burst depth, and the nearness of the sea bottom to the point of burst.

Where the burst depth is sufficient to prevent the fireball from breaking the surface, virtually all energy is dissipated as shock, and the fallout is negligible. (all on slide 11)

5. **EFFECTS OF NUCLEAR DETONATIONS.** There are four effects of nuclear weapons detonations that are of military significance. These effects are thermal energy, nuclear blast, electromagnetic pulse, and nuclear radiation. (Note: EMP is a product of nuclear detonations, however, the energy output poses no threat to personnel or structures, and is not directly measured.)

a. **Thermal Energy.** Within milliseconds after detonation, the temperature of the fireball reaches several million degrees centigrade resulting in a large output of thermal energy in the form of heat and light.

Thermal energy travels in a straight line and is easily attenuated, being stopped by a small amount of material. If the material is flammable, it may burn resulting in widespread fires. The light from a nuclear explosion may cause temporary or permanent blindness.

b. **Nuclear Blast.** The nuclear blast manifests as air pressure or wind emanating from the explosion. This blast travels in all directions and is 50% of the energy released from a nuclear explosion.

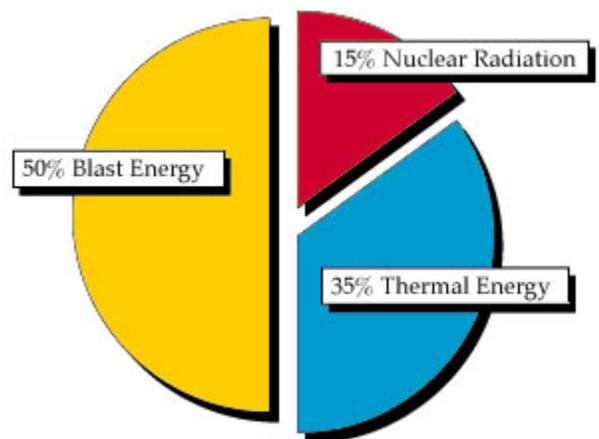


Figure 6-1: Nuclear Detonation Effects

There are two phases to the blast. The first phase is a compression wave traveling out from ground zero. After this initial wave passes, there will be a lull as the air pressure drops. This drop in air pressure around ground zero results in a second phase, a less intense negative phase coming back towards ground zero.

(1) There are two ways a nuclear blast wave can cause damage.

(a) **Overpressure.** Overpressure is the difference between the pressure inside and outside of an object. This is due to what experts call "hydraulic ramming". It occurs when tornado winds catch on a small opening into the house, suddenly jamming the house with air - like blowing up a balloon. The resultant "overpressure" can cause the house to blow outwards, appearing to explode. The pressure from a nuclear blast can cause buildings or material to do the same and can harm personnel internally.

(b) **Dynamic Pressure.** This is the pressure of the wind against an object. Walk outside into a breeze and the force of the air molecules on one's face is an example of dynamic pressure. Dynamic pressure causes damage by pushing objects around, into or through other objects.

c. **Electromagnetic Pulse (EMP)**. EMP is a broadband electromagnetic energy pulse of short duration produced by the interaction of nuclear radiation with the atmosphere and the earth's surface. It is short lived, but produces tremendous amounts of energy. High altitude and surface burst are the primary producers of EMP.

**Student Note**

The amount of energy released from a nuclear detonation is tremendous. There is, however, no way to quantify this amount of energy, and thus, the proportion is not included with the other three effects found in Figure 6-1.

(1) **Collectors of EMP Energy**. EMP will have a tendency to collect in things like long runs of cable, corrugated roofs, metal fencings, large antennas, power lines etc. Care should be taken to disconnect these items when possible to avoid the collection of EMP.

(2) **Equipment Susceptible To EMP**

(a) **Most susceptible**. Computers, power supplies, alarms systems, intercom system and life-support system controls

(b) **Less susceptible**. Vacuum-tube equipment that does not include semiconductor rectifiers (transmitter, receivers and teletype-telephone).

(c) **Least susceptible**. High voltage 60 cycles per second (cps) equipment (transformers, motors, heaters, heavy-duty relays, circuit breakers).

d. **Nuclear Radiation**. Blast and thermal effects occur to some extent in all types of explosions, whether conventional or nuclear. The release of ionizing radiation, however, is unique to nuclear explosions and is an additional casualty producing mechanism. This radiation is emitted at the time of detonation in the form of initial radiation and downwind as residual radiation (fallout).

(1) **Initial Radiation**. Initial nuclear radiation is ionizing radiation emitted within the first minute after detonation and results almost entirely from the nuclear processes occurring at detonation. About 5% of the energy released in a nuclear airburst is in the form of initial neutron and gamma radiation. The neutrons result almost exclusively from the energy producing fission and fusion reactions, while the initial gamma radiation comes from these reactions as well as from the decay of short-lived fission products.

The intensity of initial nuclear radiation decreases rapidly with distance from the point of burst due to absorption, scattering and capture by the atmosphere. The type of radiation received at a given location also varies with distance from the explosion. Near the point of the explosion, the neutron intensity is greater than the gamma intensity, but with increasing distance, the neutron radiation decreases. Ultimately, the neutron component of initial radiation becomes negligible in comparison with the gamma component.

The range for significant levels of initial radiation does not increase markedly with weapon yield and, as a result, the initial radiation becomes less of a hazard with increasing yield. With larger weapons, above 50 Kilotons (KT), blast and thermal effects are so much greater in importance that initial radiation can be ignored.

(2) Residual Radiation. Residual radiation is defined as that radiation which is emitted later than 1 minute after detonation and comes principally from the decay of radioisotopes produced during the explosion. Residual radiation takes the form of fallout from surface bursts or neutron induced areas from airbursts.

(a) Fallout. Large amounts of earth and other material will be vaporized by the heat of the fireball and drawn up into the mushroom cloud. This material becomes radioactive and returns to the earth as fallout. Fallout can be divided into immediate, medium range and long-range fallout.

1 Immediate. Immediate fallout is heavy debris deposited within half an hour after the burst. This occurs mostly in the same area in which physical damage occurs.

2 Medium Range. Medium Range fallout is deposited between half an hour and 20 hours after a nuclear explosion. Medium range fallout is militarily significant and may extend out hundreds of kilometers from ground zero when large weapons are used. This is the primary concern when conducting nuclear hazard prediction.

3 Long-Range. Long-Range fallout consists of very small particles, which may fall for months or even years, particularly after a high yield thermonuclear explosion. This is diffused and eventually deposited over a large area of the earth's surface.

(b) Neutron Induced Areas. Neutrons are produced in all nuclear bursts. Some of these neutrons may be captured by the various elements in the soil under the burst. As a result,

these particles become radioactive, emitting beta and gamma radiation for an extended period.

Because beta particles are a negligible hazard unless ingested or in direct contact with the skin, neutron induced areas are primarily a gamma radiation hazard.

Neutron induced areas are present in all nuclear explosions, but are of operational concern in airburst only. An airburst will produce a circular pattern of neutron-induced activity around ground zero that is unaffected by weather.

6. **YIELD OF NUCLEAR WEAPONS.** The “yield” of a nuclear weapon is a standard measurement of the amount of explosive energy it can produce. Yield is commonly expressed as the quantity of chemical explosive (TNT) that would produce the same energy release when it explodes. For example, the atomic weapon which decimated Hiroshima in 1945 had a yield of 13 kilotons: that is, the explosive power of 13,000 tons of TNT.

The largest conventional bomb dropped in World War II contained about 10 tons of TNT.

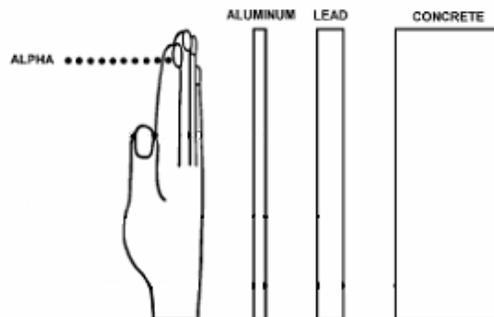
Since Hiroshima, the yields of nuclear weapons have been vastly increased. The world’s largest nuclear detonation, set off in 1962 by the Soviet Union, had a yield of 58 megatons: equivalent to 58 million tons of TNT.

#### STUDENT NOTE

As the yield of nuclear weapons increase, the destruction caused does not increase as one might expect, and varies on the deployment of such devices. For example, a single nuclear bomb with a yield of 1 megaton would destroy 80 square miles, while 8 bombs, with a yield of 125 kilotons each, would destroy 160 square miles. This is one reason for the development of delivery systems that are capable of carrying multiple warheads.

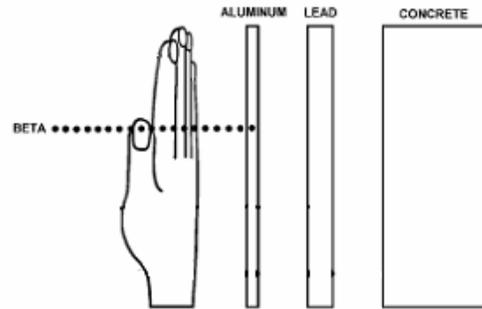
7. **TYPES OF RADIATION.** There are four types of radiation associated with nuclear detonations that are of biological significance.

a. **Alpha.** An alpha particle is a helium nucleus consisting of two protons and two neutrons. They are positively charged and highly ionizing but have little penetrating power. If the source of the radiation is external to the body, all of the alpha radiation is absorbed in the superficial layers of dead skin cells, or any outer clothing or covering. Because of this, alpha radiation is not an external hazard but is a significant hazard if ingested or inhaled.



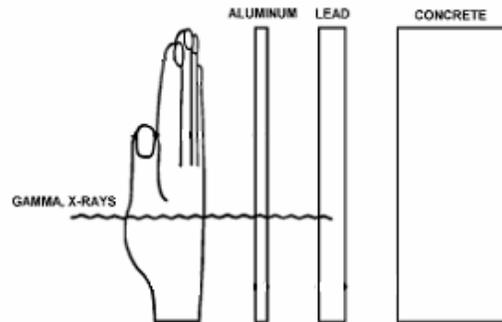
b. **Beta.** Beta particles are electrons that are ejected from an atom when the atom rearranges itself into a more stable configuration. They are negatively charged, but can only penetrate a few millimeters of skin tissue. If the beta-emitting material is on the surface of the skin, the resulting beta radiation causes damage to the skin similar to a superficial thermal burn but causing significantly more damage.

If the beta particles are ingested or inhaled, the damage will be in small spheres of tissue around each fragment or radioactive source. The total tissue damage is a function of the number of such sources within the affected tissue. Dead cells are replaced quickly in most tissues. The less dense energy deposition of beta radiation may simply damage rather than kill affected cells, thereby causing cells to mutate as they divide. Beta radiation is a significant hazard if ingested or inhaled.

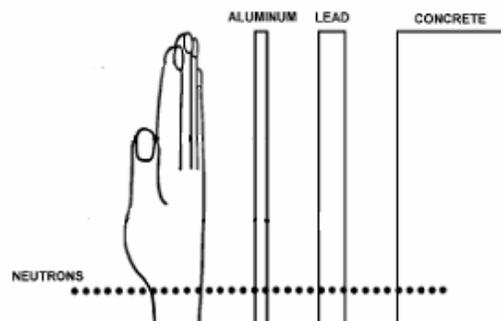


c. **Gamma.** Gamma radiation is emitted during the nuclear detonation or later in fallout. It is an electromagnetic wave and has no charge. Because gamma radiation has no charge or mass, it is highly energetic and is extremely penetrating.

Because of its penetrating power, the effects of gamma radiation can be independent of the location of the source, (i.e., internal or external to the body). High-energy gamma emitters deposited within the body can result in total body irradiation just as effectively as external sources, if the quantities deposited are large enough and despite the fact that the emitters may not be distributed uniformly throughout the body.



d. **Neutron.** Neutrons are produced in the processes of nuclear fission and fusion. Neutrons have no charge, yet because of their relatively large mass, they can severely disrupt atomic structures. Compared to gamma rays, neutrons can cause much more damage to tissue. Collisions with atomic nuclei slow down a neutron so it may undergo nuclear capture. In nuclear capture, the neutron is actually absorbed into the target nucleus making the nucleus



unstable and, therefore, radioactive.

8. **MEASUREMENT OF RADIATION.** The detection and measurement of radioactive fallout produced by nuclear explosions will give important information affecting operations. There are different units for measuring radiation, just as there are different units of measurement for distance.

a. **Radiation Absorbed Dose (rad).** A rad is a measurement of energy absorbed, per unit of absorbed mass. The rad was developed to place all types of radiation on an equal footing. Earlier types of measurement, like the roentgen, only dealt with individual radiation types in a certain medium, like air. The rad deals with any kind of radiation in any medium in terms of fundamental energy units. The sub unit of the rad is the millirad (mrad). It takes  $1000 \text{ mrad} = 1 \text{ rad}$ .

b. **Gray (Gy).** The gray (Gy) is the international unit that is used to measure radiation in the same manner as the rad. One hundred centigray (cGy) is equal to one gray. Most of the Marine Corps radiation detection and measuring equipment reads in Gray.

c. **Total Dose.** Total dose is the amount of radiation absorbed by man and material. Dose is best compared to the odometer in a car. The odometer tells someone the total number of miles the car has been driven. Instruments designed for total dose will tell someone the total number of rad or an equivalent unit of measurement it has been exposed to.

d. **Dose Rate.** Dose rate is the degree of exposure to radiation, normally expressed in cGy per hour (cGyph). Back in the previously mentioned car, one can compare a dose rate instrument to the speedometer. The speedometer will tell the driver the rate at which they are moving. The dose rate instrument will tell an individual their rate of exposure to radiation. Even though the car is moving at 55 mph, that doesn't mean 55 miles has been instantly covered in distance. Similarly, being exposed to 25 cGyph does not mean one has received a dose of 25 cGy, but will if they remain in the area for one hour.

9. **SYMPTOMS AND TREATMENT OF RADIATION EXPOSURE.** Radioactive material released into the environment can pose both an internal and external hazard to personnel operating in radiological environments. Of the four types of radiation, alpha and beta radiation present primarily internal hazards, while gamma and neutron radiation present both internal and external hazards.

**Student Note**

Alpha and beta radiation affect the body by entering through inhalation, ingestion or open wounds. Gamma and neutron radiation penetrates most material and can affect the entire body.

a. **Symptoms.** The key signs and symptoms of radiation sickness that indicate radiation exposure has occurred are described below. Some of these signs and symptoms, along with the information provided in the table below, can provide an estimate as to the approximate severity of exposure.

**Table 10-1: Dose, Onset, and Duration of Symptoms**

<b>DOSE (cGy)</b>	<b>SYMPTOMS</b>	<b>ONSET</b>	<b>DURATION</b>
0-35	None	N/A	N/A
35-75	Mild Nausea, Headache	6 Hours	12 Hours
75-125	Nausea/Vomiting (30%)	3-5 Hours	24 Hours
125-300	Nausea/Vomiting (70%)	2-3 Hours	3-4 Days
300-530	Nausea/Vomiting (90%) Diarrhea (10%)	2 Hours 2-6 Hours	3-4 Days 2-3 Weeks
530-830	Severe Nausea/Vomiting (90%) Diarrhea (10%)	1 Hour 1-8 Hours	Direct Transit into GI Syndrome
830-3000	Severe Nausea/Vomiting (90%) Disorientation (100%)	3-10 Min 3-10 Min	Persists Until Death 30 Min-10 Hours

(1) **Nausea and Vomiting.** Nausea and vomiting occur with increasing frequency as the radiation dose exceeds 100 to 200 cGy. Their onset may be seen as long as 6 to 12 hours post exposure and usually subsides within the first day for these lower doses. The occurrence of vomiting within the first two hours is usually associated with a severe radiation dose. Vomiting within the first hour, especially if accompanied by explosive diarrhea, is associated with doses that frequently prove fatal. Due to the transient nature of these symptoms, it is possible that the patient will have already passed through the initial phase of GI distress before being seen by a physician. It will be necessary to inquire about these symptoms at the initial examination.

(2) **Hyperthermia.** Casualties who have received a potentially lethal radiation injury show a significant rise in body temperature within the first few hours post exposure. Although the number of cases is few and is frequently overlooked, this condition appears to be a consistent finding. The occurrence of fever and chills within the first day post exposure is associated with a severe life-threatening radiation dose. Hyperthermia may occur in patients who receive lower, but still serious radiation doses (200 cGy or more).

(3) Erythema. A person who has received a whole body dose of more than 1000 cGy will develop erythema within the first day post exposure. Erythema is less frequently seen with lower doses (200 cGy or more). Erythema multiforme is characterized by spots, blisters, or other lesions on the skin and usually results from a reaction to medications, infections, or illness.

(4) Hypotension. A noticeable and sometimes clinically significant decline in systemic blood pressure has been recorded in victims who have received a supralethal whole body radiation dose. A severe hypotensive episode was recorded in one person who had received several thousand cGy. In persons who received several hundred cGy, a drop in systemic blood pressure of more than 10 percent has been noted. Severe hypotension after irradiation is associated with lethal injury. However, if the radiation dose has been determined to be less than 1000 cGy, then a physical injury should be suspected as being responsible for the hypotension.

**Table 10-2: Relative Radiosensitivity of Various Tissues**

<b>ORGANS</b>	<b>RELATIVE RADIOSENSITIVITY</b>
Lymphoid organs; bone marrow, testes and ovaries; small intestines; embryonic tissue	High
Skin; cornea and lens of eyes; gastrointestinal organs: cavity, esophagus, stomach, rectum	Fairly high
Growing cartilage; the vasculature; growing bones	Medium
Mature cartilage or bone; lungs; kidneys; liver; pancreas; adrenal gland; pituitary gland	Fairly low
Muscle; brain; spinal cord	Low

(5) Neurological Dysfunction. Experience indicates that almost all persons who demonstrate obvious signs of damage to the central nervous system (CNS) within the first hour post exposure have received a supralethal dose. Symptoms include mental confusion, convulsions, and coma. Without aggressive medical support, these patients succumb within 48 hours.

(6) Psychological Effects. Personnel witnessing a nuclear detonation are likely to suffer sensory overload as well as the fear of injury or death. Some personnel may have immediate adverse psychological reactions, even in the absence of actual physical injury. (slide 30)

b. Treatment. Nuclear casualties should be treated the same as conventional casualties. Wounds caused by blast are similar to other combat wounds. Thermal burns are treated as any

other type of burn. First aid cannot help radiation casualties. These casualties must be referred to medical facilities.

### **STUDENT NOTE**

It is important to remember a prognosis based on physical factors is sometimes difficult because it is possible for some people to absorb nearly twice as much radiation as others without serious harm. The very old and very young are the most susceptible. Pathological examinations would not only be largely impracticable but of little use. We come eventually to old fashioned clinical medicine and observation and particularly to timing of onset of symptoms after exposure, for the real guide. If there are no symptoms for 24 hours after exposure and then they consist only of slight vomiting and nausea, the prognosis is good. If persistent vomiting occurs within two hours, fever before seven days, or purpura (hair loss) before three weeks, the prognosis is probably hopeless. Treatment consists of rest and sedation and a bland nourishing diet with plenty of fluids. In the more severe cases, intravenous fluids and antibiotics of the erythromycin wide-spectrum type should be started after the fifth day.

10. **UNIT SURVIVAL MEASURES FOR NUCLEAR WARFARE.** Unit survival measures include protective steps taken pre-attack, during, and post-attack that can be accomplished in the event of a nuclear threat or attack. In addition to these specific actions, additional considerations, such as those indicated below, must be taken into account.

1. Personnel can reduce their risk of becoming casualties by knowing how terrain affects nuclear weapons. It is essential for personnel to recognize positions that provide optimum protection against possible nuclear blasts.

2. Reverse slopes of hills and mountains give some nuclear protections. Both heat and light from the fireball of a nuclear blast, as well as the initial radiation tend to be absorbed by hills and mountains. Energy that is not absorbed is deflected above personnel because of the slope.

3. The use of gullies, ravines, ditches, natural depressions, fallen trees, and caves can also reduce the number of nuclear casualties. While predicting the actual point of a nuclear attack is impossible, the best protection remains an area below ground with some form of overhead cover.

4. When the threat of nuclear weapons use is high, smoke can be used to attenuate (weaken) the thermal energy effects from nuclear detonations.

a. **Pre-attack Actions.** These actions are critical because they will increase the unit's survivability to the greatest possible extent. These actions range from selecting the right shelters,

fortifying those shelters, and protecting vital equipment. Of primary concern should be protection from gamma and neutron radiation. Gamma radiation protection requires thick layers of dense or heavy shielding material, such as lead, iron, or stone. Neutron radiation protection, however, can be provided by light, hydrogen-based materials (water, paraffin, and oil).

#### Student Note

Water delays and absorbs neutrons, however, since gamma radiation is also given off in a nuclear detonation, dense shielding is still required.

(1) Fighting Positions. Digging in provides improved defense, as earth is a good shielding material. Not only does a well-constructed fighting position provide excellent protection against initial nuclear effects, but it can also reduce residual radiation (from fallout).

(2) Field-Expedient Overhead Cover. Adequate overhead cover is capable of reducing exposure to thermal and initial nuclear radiation, as well as fallout. When constructing effective overhead cover, personnel should keep these factors in mind: choose dense covering materials; cover in depth; provide strong supports; and cover as much of the opening as possible.

(3) Earth-Shielded Positions. Bunkers can provide excellent protection against all effects of a nuclear detonation. It is important that as much earth cover as possible should be placed between the individual and the blast. Sand, or compact clay, provides better radiation shielding than earth (because it is denser). Dampening the cover (earth, clay, concrete) protects from both gamma and neutron radiation.

(4) Buildings. Certain types of building can offer excellent shelter from nuclear hazards, and require only a minimum amount of time and effort to adapt for use. Buildings must be chosen carefully; the stronger the structure, the better protection against blast effects.

(5) Tents. Not a preferred shelter against the effects of nuclear weapons, however, they can provide limited protection from residual nuclear effects (particulate fallout).

(6) Armored Vehicles. These vehicles are capable of providing good nuclear protection, which can also be improved (if time is available) by digging-in these vehicles, or placing them in trenches or cuts in roadways. Sandbags can also be used as radiation shielding.

(7) Electromagnetic Equipment. When ample warning has been given, electronic equipment (radios and computers) must be turned off and protected. Damage from an EMP can induce a current in any unprotected electrical conductor and disrupt or overload and damage components.

b. **During Attack Actions**. As previously covered in the CBRN Immediate Actions period of instruction, nuclear attack indicators are unmistakable. Immediate actions must be automatic and instinctive. These steps include the following:

- (1) Drop facedown immediately with feet facing the blast.
- (2) Close eyes.
- (3) Protect exposed skin from heat by putting hands and arms under or near the body and keeping the helmet on.
- (4) Remain facedown until the blast wave passes and debris stops falling.

Additional protective measures for personnel in fighting positions or shelters must be initiated automatically as well. These steps were also previously covered and additional information can be found in MCWP 3-37.2, page II-14.

c. **Post-attack Actions**. Protection must not stop when the attack ends. Post-attack recovery begins immediately after an attack.

- (1) Personnel must check for contamination. Hazards must be reduced utilizing appropriate decontamination techniques (brush, scrape, or flush radiological contamination from surfaces).
- (2) Unit personnel should cover positions and shelters, and RADIAC meter operators begin continuous monitoring. Use of IPE effectively reduces the amount of contamination that can enter the lungs and the potential for skin burns (alpha and beta particles).

## **REFERENCES**

1. FMFM 11-2 Nuclear, Biological, and Chemical Operations.
2. MCWP 3-37.2 NBC Protection
3. MCWP 3-37.3 NBC Decontamination (FM 3-5)
4. FM 8-9 NATO Handbook on the medical aspects of NBC Defense Operations

**UNITED STATES MARINE CORPS  
Field Medical Training Battalion  
Camp Pendleton**

**FMSO 1405**

**Recognize Combat Stress Disorders**

**TERMINAL LEARNING OBJECTIVES**

1. Given a psychological casualty in a combat environment and the standard field medical equipment and supplies, manage combat stress disorders to stabilize the casualty. (FMSO-HSS-1405)

**ENABLING LEARNING OBJECTIVES**

1. Without the aid of references, given a description or title, identify the definition of combat stress, per the student handout. (FMSO-HSS-1405a)
2. Without the aid of references, given a list, identify factors that increase the risk of combat stress, per the student handout. (FMSO-HSS-1405b)
3. Without the aid of references, given a list, identify the symptoms of combat stress disorder, per the student handout. (FMSO-HSS-1405c)
4. Without the aid of references, given a list, identify treatment for combat stress disorder, per the student handout. (FMSO-HSS-1405d)
5. Without the aid of references, given a simulated combat stress casualty and standard field medical equipment, manage a combat stress casualty, per the student handout. (FMSO-HSS-1405e)

## 1. **DEFINITIONS**

- a. **Stress-** An internal process of an individual for preparation in dealing with, or reacting to stressors.
- b. **Combat Stress** - The mental, emotional, or physical tension, strain, or distress resulting from exposure to combat-related conditions.

## 2. **PHYSICAL SYMPTOMS**

- a. Nausea
- b. Trembling
- c. Tachycardia
- d. Incontinence
- e. Diaphoresis
- f. Sleep disruption
- g. Headache
- h. Backache
- i. Fatigue
- j. Exhaustion ( Thousand-yard stare)
- k. Irritability
- l. Easily startled by noise, movement, and light.
- m. Freezes under fire

**NOTE:** These are essentially normal or expected responses to the spector of combat but can be totally disabling.

## 3. **SEVERE SYMPTOMS**

- a. The behavioral and psycho-physiological manifestations of combat stress are many and varied.
- b. Severe Combat stress casualties may demonstrate psychological symptoms of:
  - (1) Hysterical paralysis
  - (2) Overwhelming anxiety
  - (3) Disassociation
- c. Psychosis is rarely present, although the sum of the symptoms may give the appearance of the service member having a psychosis.
- d. The one (1) universal characteristic or element of all these conditions is their potential to remove an individual from combat.
  - concentration lapses, irritability, and lethargy.

## 4. **FACTORS RELATING TO COMBAT STRESS**

- a. **Factors that increase the risk of combat stress**
  - (1) Sense of isolation

- (2) Intensity of the combat
- (3) Duration of exposure

b. Factors that decrease the risk of combat stress

- (1) High unit cohesion
- (2) High morale
- (3) Good leadership
- (4) Proper training for mission

c. High risk personnel

- (1) Variability of combat exposure - units that operate in combat support whose involvement in combat may fluctuate from boring safety to terrifying attacks.
- (2) Prisoners of war
- (3) Older, non-professional Marines, Sailors , and Soldiers.
- (4) Having a character or behavior disorder does not predispose one to combat stress; however, once having become a casualty, the recovery period is significantly longer.

5. TREATMENT

a. PRINCIPLES- Most casualties are fully recovered in 24 to 48 hours.

However, guidelines for treating Marines showing signs of Combat Stress are summarized in the memory aid **BICEPS**. **BICEPS** stands for Brevity, Immediacy, Centrality, Expectancy, Proximity, and Simplicity.

- (1) Brevity – Treatment lasts no more than three days. Those requiring further treatment are moved to the rear.
- (2) Immediacy – Provide care as soon as symptoms appear.
- (3) Centrality – Combat stress cases are treated in one central location near but separate from the Battalion Aid Station or field hospital if possible. In a mobile war requiring rapid and frequent movement, treating combat stress in a single area is impossible, in these cases treatment may take place at the BAS or Regimental Aid Stations.
- (4) Expectancy – It is made clear the individual is reacting normally to stress and is returned to full duty in a few days.
- (5) Proximity – Care for the combat stress victims is held close association with the unit and as an intricate part of the entire healing process. A visit from a member of the individual's unit during restoration is very effective in keeping a bond with the organization.
- (6) Simplicity – Treatment is keep it simple. The goal is to rapidly restore the Marines coping skills so that they may return to full duty.
- (7) Restraining – It is important to know the difference between an individual who is psychotic, one with a serious mental disturbance, and a combatant suffering from exhaustion and fatigue. Recommendation for evacuation should be made only for those individuals having mental disorders or whose evacuation is authorized by senior person on the scene. Physical restraint may be necessary for violent and disruptive personnel. Once the decision to restrain and individual has been made, the leader takes four other persons and assigns them to parts of the extremities. (i.e., You have the left leg, you take the right arm, etc.)

Note: Most service members receiving Combat Stress control in accordance with the principles of BICEPS return to duty quickly.

- b. In the combat area there are important factors for the treatment of combat stress:
  - (1) Provide rest, a place to sleep, good food, and someone to speak with
  - (2) Most combat stress casualties (up to 90%) require only a brief respite from battle in an understanding atmosphere with the expectancy of retraining to combat.
  - (3) The casualty's uniform is not taken away
  - (4) As soon as he/she is able, they are given a job assisting other patients

## 6. **PREVENTION**

### a. **Pre-deployment**

- (1) Be aware of commitments
- (2) Prepare family and loved ones
- (3) Get your personal affairs in order
- (4) Educate your troops and yourself in the kinds of reactions to stress they can expect, both in garrison, the field exercise, and actual combat. Helping them understand the formation of a reaction to stress and the range of normal reaction will help them develop more healthy adaptation responses.

### b. **During deployment**

- (8) Learn how much stress you can handle
- (9) Recognize stress in yourself and others
- (10) Physical fitness (The #1 way to reduce stress!!!)
- (11) Spending time alone (be aware of too much time alone, however)
- (12) Support groups
- (13) Stay out of set routines as this will lead to boredom
- (14) Try to get at least four (4) hours sleep per day
- (15) Get good sleep before going on sustained operations
- (16) Catnap when you can, but allow time to wake up fully
- (17) Catch up on sleep, after going without

- c. **Post Deployment** – Just as predeployment and combat are stressful, the period after combat is also difficult. Today's rapid transportation enables Marines to travel from the battlefield to their hometown in 48 to 72 hours. This short time often does not give them time to sort out with their comrades what happened in combat or what will happen afterward.

## **REFERENCES**

Combat Stress, FM 90-44/6-22.5, Pgs 2,4-5,28,41-46, 34-35, 51-54

Combat Stress Control in a Theater of Operations, FM 8-51, Pg 5

Stress the Silent Killer, Article Online, Holistic Online.com ICBS, Inc., Pgs 1-2



**UNITED STATES MARINE CORPS  
Field Medical Training Battalion  
Camp Pendleton**

**FMSO 1406**

**Individual First Aid Kit (IFAK)**

**TERMINAL LEARNING OBJECTIVE**

1. Given a simulated injury in a simulated operational environment and an Individual First Aid Kit (IFAK), **utilize the IFAK**, in accordance with the references. (FMSO-HSS-1406)

**ENABLING LEARNING OBJECTIVE**

1. Without the aid of references, given an IFAK, **identify the components of the IFAK**, within 80 percent accuracy, per the MCRP 3-02G and the User's Instructions for the IFAK. (FMSO-HSS-1406a)

## 1. COMPONENTS OF THE INDIVIDUAL FIRST AID KIT (IFAK)

The IFAK is designed to be more compact and have greater life saving capability than its predecessors. The IFAK is issued to every Marine and Sailor. The Corpsmen Assault Pack each Corpsman carries will have more medical gear than the IFAK but this section is designed to introduce its contents and characteristics to you.

Bleeding to death is the leading cause of preventable death on the battlefield. As such, each Marine's IFAK contains many of the items discussed in this chapter. It is essential that all Marines are properly trained in their use.

### Minor Injury Kit Components:

The Minor Injury Kit is used for minor injuries, cuts, burns, and bruises. The components of the kit and their use are as follows:

First Aid Ointment - bacitracin antibiotic ointment is used to prevent infection of minor cuts, abrasions and scrapes. There are eight packets contained in the kit.

Adhesive Bandages - the adhesive bandages come in both large and small sizes. There are 12 small and 5 large adhesive bandages in the kit.

Triangular Bandage "Non-sterile" - the triangular bandage is a 40" x 40" x 56" section of material. It is a versatile bandage that comes in a small package with two safety pins. It can be used to hold dressings in place. It may also be used as a tie, strap, sling or swathe for supporting strains or sprains and/or splinting fractures. There are two triangular bandages in the kit.

Mini Duct Tape Roll - versatile tape that serves multiple purposes. There is one mini duct tape roll that measures 2"x100" in the kit.

Betadine Solution - disinfectant used to clean and disinfect minor cuts and abrasions. There is one ½ fluid ounce bottle solution in the kit.

Burn Dressing "Water Jel" - the burn dressing is a 4" x 16" woven material saturated with gel. It is Food and Drug Administration (FDA) approved and has been proven to extinguish white phosphorous burns. It is the first response for burn injuries. When applied to a burn, it cools the burn area, reduces the chance of hypothermia, and prevents the burn from further progression. It also protects the burn from further contamination or infection and eases the pain of the burn victim.

Water Purification Tablets - purifies water that may not be drinkable. There are two different kinds of tablets depending upon which generation IFAK you have:

- The *Tetraglycine Hydroperiodide (Titratable Iodine)* tablets come in a small opaque bottle and are used to purify water from 1 quart to 1 liter.

OR

- The *Micropur MP 1 Water Purification Tablets* come in a foil packet and are used to purify water from 1 quart to 1 liter.

## **Trauma Kit Components**

The trauma kit is used for major bleeding injuries to include life threatening hemorrhage. The components of the trauma kit and their use are as follows:

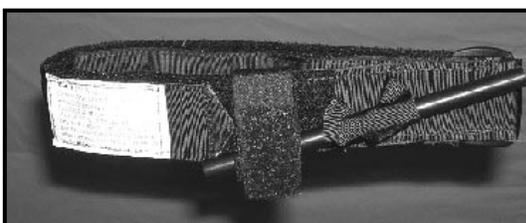
**Bulky Gauze Rolls** - there are two cotton gauze rolls in the trauma kit. The gauze rolls are used for the protection of minor wounds, can be loosely wrapped around the burn dressing to secure it over the burn area, or used to apply direct pressure to medium and severe bleeding from wounds. The gauze can also be used to wipe away excess blood prior to the application of the hemostatic agent.

**Pressure Dressing** - there are two pressure dressing bandages in the trauma kit. These pressure dressing bandages are 4" wide elastic wraps with 8" x 10" absorbent cotton pad attached close to the end of one side of the elastic wrap. On the other side of the absorbent pad, in the middle on the elastic wrap side, is a hard plastic H-anchor that allows for application by an individual. At both ends of the elastic wrap are Velcro strips that provide adhesion. In the older version of the bandage, there is a plastic hook to reinforce pressure. The hook proved to be of little use; therefore the newer version is without the hook. Pressure dressings can be applied to chest, abdominal, head, neck, and extremity wounds.

**Tourniquet** - there are two tourniquets in the Trauma Kit. The tourniquet is an elastic band with two steel hooks. It is used to stop arterial and venous blood flow from the extremities. The tourniquet must be applied two to four inches above the wound, between the wound and the heart. Once it has been applied, it can only be removed by medical personnel. The Combat Application Tourniquet (CAT), shown below, does not come in the IFAK but is given to deploying forces prior to deployment.

### **NOTE:**

The CAT is predominately used in the Fleet Marine Force. It does not come with IFAK; however, one may be acquired when checking into your unit.



**Figure 1. CAT Tourniquet**

**Hemostatic agent (Quikclot)** - FDA approved, sterile granular mineral powder, which is vacuum-sealed to prevent moisture from being absorbed. When applied to a wound with severe venous or arterial bleeding, it causes the wound to develop a clot that will stop the flow of blood. The clot is created as the agent absorbs the water from the blood. Once applied and a clot is formed, it will remain in the wound until removed by medical personnel.

QuikClot is used in extremities, groin/pelvic area and armpits along with bulky gauze and pressure dressings for severe, uncontrolled bleeding. Do not use QuikClot on open chest, abdominal, neck, or facial wounds.



**Figure 2. QuikClot**

**NOTE: LOCAL TEMPERATURE INCREASES TO 109 F° – 114 F° WHEN IN CONTACT WITH BLOOD. REACTION LASTS 4 TO 5 SECONDS.**

## **FYI...**

### Instructions for using QuikClot

- (1) Apply direct, firm pressure to wound using sterile gauze dressing.
- (2) If bleeding is stopped or nearly stopped after approximately 1 minute of pressure, wrap bandage to maintain pressure on wound and seek MEDICAL CARE.
- (3) If moderate to severe bleeding continues, hold pack away from face and tear open tabs.
- (4) Use wiping motion to remove gauze and bandages, making certain to wipe away as much excess blood and liquid as possible.
- (5) Pour (DO NOT DUMP) QuikClot in a back and forth motion onto the source of the bleeding. QuikClot changes from its dry beige color to a dark color as it absorbs moisture and begins to clot.
- (6) Stop pouring promptly when you see a dry layer of QuikClot on wound indicating that there is no more blood to absorb.
- (7) Immediately bandage wound and apply firm pressure.
- (8) Seek MEDICAL CARE immediately.
- (9) Be certain QuikClot package accompanies patient during transport so medical personnel will know QuikClot was used on the wound..

### **SAFETY NOTE:**

Avoid contact with wet skin. QuikClot reacts with small amounts of water and can cause burning. Stop burning by brushing away granules and flooding area with a large volume of water. If ingested, immediately drink 2 or more glasses of water. Avoid inhalation, dust may irritate eyes, nose, throat or skin. Avoid getting in eyes, if eye irritation occurs, flush with water for 15 minutes.

Rev: Aug 2008

UNITED STATES MARINE CORPS  
Field Medical Training Battalion  
Camp Pendleton

FMSO 1407

Conduct Casualty Triage

TERMINAL LEARNING OBJECTIVES

1. Given multiple casualties in a tactical environment and standard field medical equipment and supplies, **conduct triage to identify triage categories for medical treatment**, per the references. (FMSO-HSS-1407)

ENABLING LEARNING OBJECTIVES

1. Without the aid of references, given a description or list, **identify the tactical principles of triage**, within 80 percent accuracy, per the Pre-hospital Trauma Life Support (current edition). (FMSO-HSS-1407a)
2. Without the aid of references, given a descriptive list of injuries, **identify the appropriate triage categories for specific injuries**, within 80 percent accuracy, per the Pre-hospital Trauma Life Support (current edition). (FMSO-HSS-1407b)

## **INTRODUCTION TO TACTICAL TRIAGE**

Triage is a French word meaning “to sort.” Casualties are sorted into groups based on their immediate medical needs. Using a standardized approach to triage casualties helps combat medics correctly segregate, treat, and prioritize evacuation in the shortest time possible. The realities of combat dictate that battlefield triage must take place in an environment limited in resources for treatment and transport. Triage merely establishes order of treatment and movement. Although all casualties require treatment, triage aids in deciding which casualties have the greatest

probability of survival and helps weigh the casualties need for lifesaving interventions (LSIs), thus determining priority and urgency for treatment and evacuation.

Triage establishes the patients’ category.

Although the type and extent of the wound may offer clues as to the triage category a

patient may fall into, it is their physiological state (how well their body is working) that is the critical factor. For instance, a patient with a weak radial pulse indicates an estimated systolic blood pressure of 80 mm/Hg. Studies of combat related injuries indicate that 32% of these individuals will die. The absence of a radial pulse indicates a systolic blood pressure of less than 50 mm/Hg. The same study reported that 92% of these individuals will die. On the other hand, a separate trauma study indicated that no casualty died if they presented during the first stages of triage with a palpable radial pulse and the ability to follow simple commands.

**Triage** ensures the greatest care for the greatest number of casualties and the maximal utilization of medical personnel, equipment, and facilities, especially in a mass-casualty incident (MCI).

-PHTLS 6<sup>th</sup> Edition p. 548

### 1. **PRINCIPLES OF TACTICAL TRIAGE**

- Accomplish the greatest good for the greatest number of casualties
- Employ the most efficient use of available resources
- Return personnel to duty as soon as possible

### 2. **THE FOUR CATEGORIES OF TACTICAL TRIAGE**

Categories are color-coded and are recognized as follows:

#### **MINIMAL (GREEN TAG)**

Also known as the “walking wounded.” Although these patients may appear to be in bad shape at first, remember, it is their physiological state that tells the true story.

Examples include but are not limited to – small burns, lacerations, abrasions, and small fractures.

These casualties have minor injuries and can usually care for themselves with self-aid or “buddy aid.” These casualties should still be employed for mission requirements (e.g., scene security).

### **DELAYED (YELLOW TAG)**

The delayed category includes wounded casualties who may need surgery, but whose general condition permits a delay in surgical treatment without unduly endangering life or limb. Medical treatment (splinting, pain control, etc.) will be required but it can wait.

Examples include but are not limited to – casualties with no evidence of shock who have large soft tissue wounds, fractures of major bones, intra-abdominal or thoracic wounds, or burns to less than 20% of total body surface area.

### **IMMEDIATE (RED TAG)**

The immediate category includes casualties who require immediate LSI and/or surgery. Put simply, if medical attention is not provided, the patient will die. **The key to successful triage is to locate these individuals as quickly as possible.** Casualties do not remain in this category for an extended period of time, they are either found, triaged and treated, or they will die!

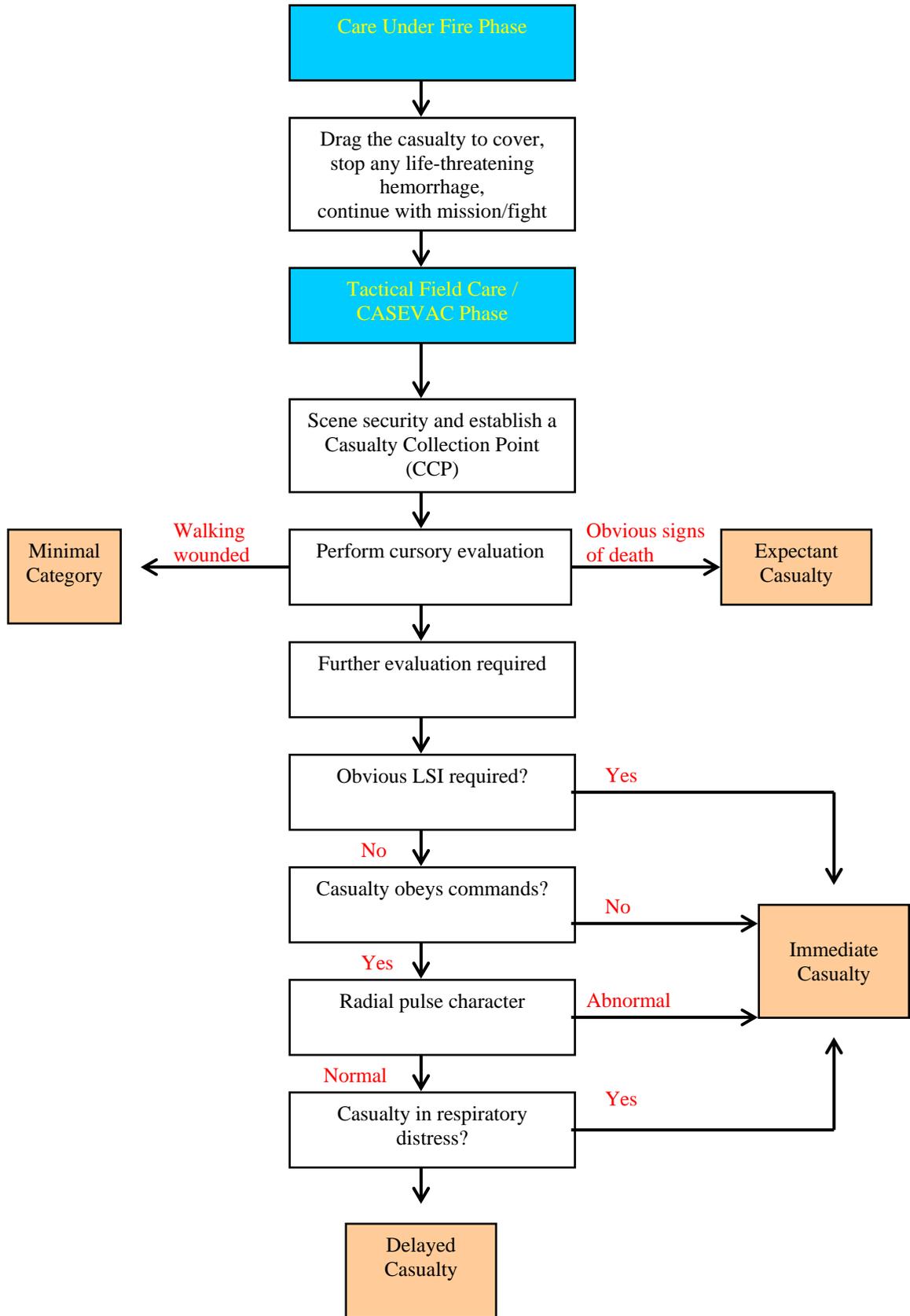
Examples include but are not limited to – hemodynamically unstable casualties with airway obstruction, chest or abdominal injuries, massive external bleeding, or shock.

### **EXPECTANT (BLACK TAG)**

Casualties in this category have wounds that are so extensive that even if they were the sole casualty and had the benefit of optimal medical resources, their survival would be highly unlikely. Even so, expectant casualties should not be neglected. They should receive comfort measures, pain medications, if possible, and they deserve re-triage as appropriate. Examples include but are not limited to – casualties with penetrating or blunt head wounds and those with absent radial pulses.

Because the tactical environment precludes an extensive array of monitoring equipment, optimal battlefield treatment and evacuation rely on simple triage tools. Based on research by the Committee on Tactical Combat Casualty Care, a triage decision algorithm has been developed (see Figure 1). Using this method will enable the FMSO to perform an initial triage of many individuals in a quick and systematic manner.

- Patients who can ambulate and follow instructions usually will fall into the minimal category. Statements such as “If you can hear my voice get up and move behind the building” (or any other place tactically correct) can triage a large portion of the casualties in a short time.
- Patients with obvious signs of death can be initially placed in the expectant category.
- Casualties who do not fit either of the above categories will need further evaluation.
- Massive bleeding is the most obvious sign of the need for a LSI. It may need a tourniquet, a hemostatic agent, or a pressure bandage.
- Once the LSI has been performed, the patient is immediately re-triaged.
- According to the algorithm, patients are placed in the delayed category if they can obey simple commands, possess a normal radial pulse, and are not in respiratory distress.



**Figure 1. Triage Algorithm for Tactical Combat Casualty Care**

### 3. **MASS-CASUALTY TRIAGE**

Operating in a tactical environment must always be prepared to deal with a mass casualty incident. Units must establish and rehearse plans for dealing with such a situation. In a mass casualty situation those responsible for triage must remember that triage is not treatment and constant reassessment is needed to identify casualties who may have deteriorated or improved.

#### **Triage Tags**

Triage tags are designed to communicate the triage category, treatment rendered, and other medical information. By necessity, the information on the tag is brief. Triage tags are usually placed on the casualty by the triage officer although other members of the team may place or add information to the tags.

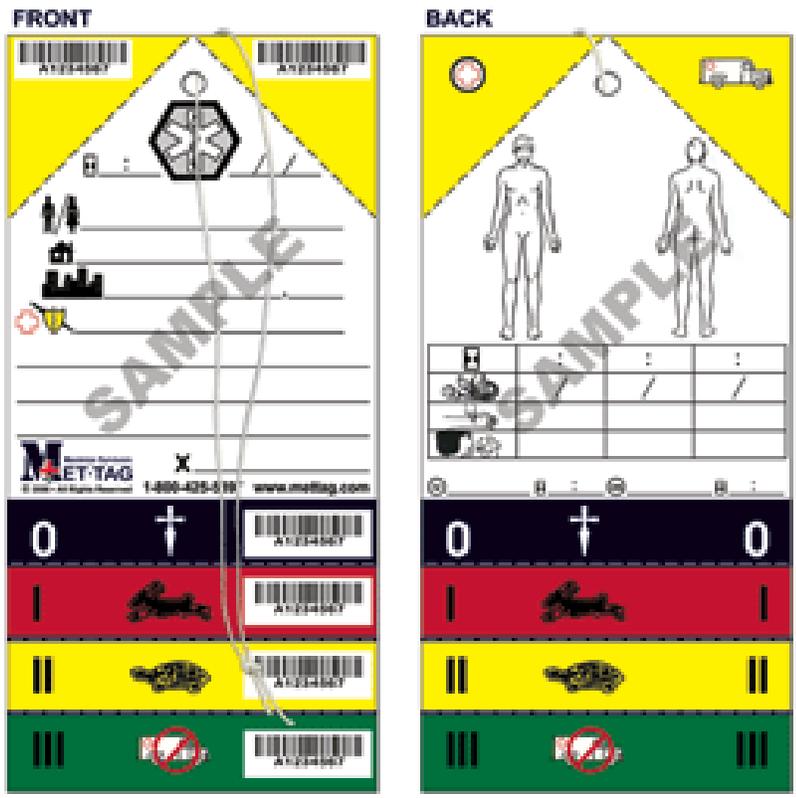
#### **NATO Card (METTAG: Medical Emergency Triage Tag)** (see Figure 2)

##### Purpose

- To furnish the attending care provider during the evacuation of a casualty with essential information about the injury or disease and the treatment provided.
- The sole or initial medical record for the troops injured in combat.
- Each triage tag is coded with a unique sequential seven-character serial number used for identification and tracking of the casualty. The serial number is located on the top right and left diagonal tear-offs.

##### Routing

- The card stays with the patient at all times.
- The yellow corner with the ambulance picture and a serial number stays with the evacuating vehicle.
- The yellow corner with the first aid sign and serial number stays at the BAS.



NATO CARD (METTAG)  
(FRONT)

NATO CARD (METTAG)  
(BACK)

Figure 2. NATO Card (METTAG)

REV: July 2008

**UNITED STATES MARINE CORPS  
Field Medical Training Battalion  
Camp Pendleton**

**FMSO 1411**

**Patient Movement**

**TERMINAL LEARNING OBJECTIVES**

1. Given multiple casualties in a tactical environment, communication equipment, NATO nine-line casualty evacuation format, and the standard field medical equipment and supplies, **understand casualty evacuation and patient movement**, per the references. (FMSO-EVAC-1411)

**ENABLING LEARNING OBJECTIVES**

1. Without the aid of references, given a description or list of capabilities, **identify the echelons of care**, within 80 percent accuracy, per MCRP 4.11.1G. (FMSO-EVAC-1411a)
2. Without the aid of references, given a description or list, **identify ground vehicles utilized as CASEVAC platforms**, within 80 percent accuracy, per MCRP 4.11.1G. (FMSO-EVAC-1411b)
3. Without the aid of references, given a description or list, **identify aircraft utilized as CASEVAC platforms**, within 80 percent accuracy, per MCRP 4.11.1G. (FMSO-EVAC-1411c)
4. Without the aid of references, given a list of characteristics, **identify the casualty receiving treatment ships**, within 80 percent accuracy, per MCRP 4.11.1G. (FMSO-EVAC-1411d)
5. Without the aid of references, given a list, **identify the casualty evacuation priorities**, within 80 percent accuracy, per MCRP 4.11.1G. (FMSO-EVAC-1411e)
6. Without the aid of references, given a description or list, **identify the purpose of a nine-line casualty evacuation communication**, within 80 percent accuracy, per MCRP 4.11.1G. (FMSO-EVAC-1411f)

## **OVERVIEW**

Casualty Evacuation (CASEVAC) Care is the third phase in the Tactical Combat Casualty Care process. The care delivered in the CASEVAC phase can more closely resemble advanced trauma life support guidelines than that in the first two phases. With either ground or air evacuation of wounded casualties from the battlefield, there is an opportunity for access to additional medical equipment not available to the Corpsman during the first two phases. This lesson will describe the different echelons of care, different methods of casualty evacuation, and how to call for an evacuation.

### 1. **ECHELONS OF CARE**

The word echelon means a level of command, authority, or rank. The level of command for care commences at the scene of the injury and continues until the member receives definitive care and is discharged or returned to full duty. While this course teaches you the skills needed to operate in Echelons I and II, there are a total of five echelons of care (see figure 1).

<b>ECHELONS</b>	<b>LEVELS OF MEDICAL CARE</b>	<b>RESOURCES</b>
Echelon I	First Aid Emergency Medical Care	Self-Aid / Buddy-Aid Hospital Corpsman Battalion Aid Station
Echelon II	Initial Resuscitative Care Surgical and Medical Resuscitation	Medical Battalion (STP/Surgical Co) Ship Surg & Holding Cap CRTS & FRSS
Echelon III	Resuscitative Care	Hospital Ship Fleet Hospital
Echelon IV	Definitive Care	Overseas MTF
Echelon V	Restorative and Rehabilitative Care	CONUS MTF Veterans Hospitals

**Figure 1. Echelons of Care**

**Echelon I** - first aid and emergency care are the primary objectives of care at this level. Other medical care offered at this echelon is fluid therapy and advanced emergency procedures that will result in patient stabilization prior to transfer to the next echelon of care. Examples of Echelon I facilities include:

Self-aid/Buddy-aid  
Battalion Aid Station (BAS)

**Echelon II** - initial resuscitative care is the primary objective of care at this level; saving life and limb, and when necessary, stabilization for evacuation to Echelon III. This echelon has greater medical capabilities than Echelon I and offers the first echelon with surgical capability. Examples of Echelon II facilities include:

Medical Battalion - provides surgical care for the MEF. Provides stabilizing surgical procedures. Capable of holding patients up to 72 hours.

Casualty Receiving & Treatment Ships (CRTS) - part of an Expeditionary Strike Group (ESG). They provide additional medical capabilities for receiving mass casualties (up to 50 casualties).

Shock Trauma Platoon (STP) - small forward unit with one physician supporting the MEF specializing in patient stabilization and CASEVAC. No surgical capability.

Forward Resuscitation Surgical Suite (FRSS) - this surgical suite is pushed as far forward to be close to the combat area to allow surgical treatment of casualties within the “golden hour” after injury.

**Echelon III** - represents the highest level of medical care available within the combat zone. Advanced resuscitative care is the primary objective of care at this level. Examples of Echelon III facilities include:

Fleet Hospitals - deployable ground assets located away from enemy threat providing up to 500 hospital beds, 80 ICU beds, and 6 OR's.

Hospital Ships (USNS Mercy and USNS Comfort) - deployable medical assets providing up to 1,000 hospital beds, 100 ICU beds, and 12 OR's.

**Echelon IV** - definitive medical care is the primary objective at this level.

Overseas Medical Treatment Facilities - offers surgical capability found in echelon III, along with further definitive therapy for those patients in the recovery phase who can be returned to duty within the theater evacuation policy. A patient who cannot be returned to duty will be evacuated to the next echelon of care.

**Echelon V** - restorative and rehabilitative care is the primary objective of care at this level.

CONUS Military, Veteran's, and Selected Civilian Hospitals - provide full convalescent, restorative, and rehabilitative care to all patients returned to the Continental United States (CONUS).

## 2. **GROUND EVACUATION PLATFORMS**

The level of urgency and the tactical situation dictates the method of evacuation. The level of care you are in, Care Under Fire, Tactical Field Care, or CASEVAC Care, will dictate how the casualty is transported. The most common forms of evacuation platforms are ground evacuation, air evacuation, or sea evacuation. Regardless, the casualty should be made as comfortable as possible and kept warm and dry. A patient with minimal injuries should be encouraged to stay in the fight if possible, and to ambulate to an area where care can be provided. Ground evacuation platforms include:

M997 Ambulance - HMMWV frame with armor protection for crew and patients. It is capable of transporting up to four litter or eight ambulatory patients (see figure 8).



**Figure 8. M997 Ambulance**

M1035 Ambulance - HMMWV frame with removable soft-top. It is capable of transporting two litter and three ambulatory patients (see figure 9).



**Figure 9. M1035 Ambulance**

MK-23 7 Ton - non-medical vehicle that may be utilized for casualty transportation when available. It is capable of transporting 10 litter or 20 ambulatory patients (see figure 10).



**Figure 10. MK-23 7 Ton Truck**

### 3. AIR EVACUATION PLATFORMS

#### CH-46 Sea Knight

- Medium lift helicopter used to transport personnel and cargo (being phased out by the MV-22 Osprey Tilt Rotor Aircraft).
- When configured for litter racks, able to carry 15 litters or 22 ambulatory patients (see figure 11).



**Figure 11. CH-46 Sea Knight**

#### CH-53 Super Sea Stallion

- Medium/Heavy lift helicopter used to transport personnel and cargo.
- When configured for litter racks, able to carry 24 litters or up to 37 ambulatory patients. When the centerline seating is added, up to 55 ambulatory patients can be carried (see figure 12).



**Figure 12. CH-53 Super Sea Stallion**

#### UH-1 Huey

- Light lift helicopter used to transport personnel and cargo.
- When configured for litter racks, able to carry 6 litters or up to 10 ambulatory patients (see figure 13).



**Figure 13. UH-1 Huey**



**Figure 14. MV-22 Osprey**

#### MV-22 Osprey

- Tilt-rotor aircraft that takes off and lands vertically but flies like a plane. This aircraft is designed to eventually replace the CH-46 Sea Knight.
- When configured for litter racks, able to carry 12 litters or 24 ambulatory casualties (see figure 14).

**NOTE:** The Marine Corps does not have dedicated CASEVAC aircraft. Any of its aircraft can be utilized as a “lift of opportunity” upon completion of its primary mission. The use of helicopter evacuation provides a major advantage because they greatly decrease the time between initial care and definitive treatment thereby increasing the casualty’s chances of survival. Figure 15 below reflects USMC assets, as well as those available through the Army and Air Force.

<b>AIRCRAFT</b>				
<b>TYPE</b>	<b>SERVICE</b>	<b>LITTER</b>	<b>AMBULATORY</b>	<b>ATTENDANTS</b>
UH-60 Blackhawk	USA	7	7	1 Medic
CH-47 Chinook	USA	24	33	2 Medics
UH-1 Huey	USMC	6	10	1 Corpsman
CH-46 Sea Knight	USMC	15	22	2 Corpsmen
CH-53 Super Sea Stallion	USMC	24	37	2 Corpsmen
MV-22 Osprey	USMC	12	24	2 Corpsmen
<b>MEDICAL GROUND VEHICLES</b>				
<b>TYPE</b>	<b>SERVICE</b>	<b>LITTER</b>	<b>AMBULATORY</b>	<b>ATTENDANTS</b>
M997 HMMWV	USA/ USMC/ USAF	4	8	1 Corpsman
M1035 HMMWV	USA/ USMC/ USAF	2	3	1 Corpsman
<b>VEHICLES OF OPPORTUNITY (GROUND)</b>				
<b>TYPE</b>	<b>SERVICE</b>	<b>LITTER</b>	<b>AMBULATORY</b>	<b>ATTENDANTS</b>
MK 23 (7-Ton Truck)	USMC	10	20	None

**Figure 15. Ground/Air CASEVAC Platform Data Description**

#### **4. CASUALTY RECEIVING TREATMENT SHIPS**

Specific ships within an Amphibious Task Force are designated as Casualty Receiving Treatment Ships (CRTS).

**LHA/LHD** - Amphibious Assault Ships whose primary differences, for our purposes, are their medical capabilities (see figures 16 and 17).

##### Mission

- Assault via helo, landing craft, and amphibious vehicle.
- Primary amphibious landing ships for MEF’s, MEB’s, and MEU’s.
- Primary CRTS.

##### Transport Capabilities

- Flight deck with large internal hangar deck and well deck.
- May receive casualties via helicopter or waterborne craft.

### Medical Capabilities

- Operating Rooms (4)
- ICU Beds (15)
- Ward Beds (45)
- Ancillary capabilities of lab, x-ray, pharmacy, preventive medicine, biomed repair, and aviation physical examination



**Figure 17. LHA Tarawa Class**



**Figure 16. LHD Wasp Class**

**HOSPITAL SHIPS (T-AH)** - the COMFORT and the MERCY are operated by the Military Sealift Command and are designed to provide emergency, onsite care for US combatant forces deployed in war and other operations. The T-AHs provide a mobile, flexible, rapidly responsive afloat medical capability to acute medical and surgical care in support of ATF; Marine Corps, Army, and Air Force elements; forward-deployed Navy elements of the fleet; and fleet activities located in areas where hostilities may be imminent. The T-AHs also provide a full-service hospital asset for use by other government agencies involved in the support of disaster relief and humanitarian operations worldwide.

### Transport Capabilities

- Flight deck capable of receiving rotary wing aircraft.

### Medical Capabilities

- Operating Rooms (12)
- ICU Beds (100)
- Intermediate Care Beds (400)
- Ward Beds (500)
- Ancillary capabilities of lab, x-ray, pharmacy, computerized tomography scanner, and blood storage.

5. **CASEVAC PRIORITIES** (see figure 18)

Once a patient has been triaged and stabilized at the BAS, should that patient require further or additional medical treatment, he/she will be prioritized for evacuation from the BAS to the next higher echelon of medical care. While evacuating patients, ensure that they are kept warm to prevent hypothermia! The priority levels are as follows:

Urgent Evacuation

- Evacuation to next higher echelon of medical care is needed to save life or limb.
- Evacuation must occur within two hours.

Urgent Surgical Evacuation

- Same criteria as urgent evacuation, however, these patients need to be taken to a facility with surgical capabilities.

Priority Evacuation

- Evacuation to next higher echelon of medical care is needed or the patient will deteriorate into the Urgent category.
- Evacuation must occur within four hours.

Routine Evacuation

- Evacuation to the next higher echelon of medical care is needed to complete full treatment.
- Evacuation may occur within 24 hours.

Convenience

- Used for administrative patient movement.

<b><u>PRIORITY</u></b>	<b><u>PRECEDENCE</u></b>	<b><u>CRITERIA</u></b>
I	Urgent	Patients that <b>require emergency, short-notice evacuation within a maximum of two hours</b> to save life, limb, and/or eyesight or to prevent serious complications of the injury, serious illness, or permanent disability.
IA	Urgent-Surgical	Patients that <b>require far forward surgical intervention</b> to save life or to stabilize for further evacuation.
II	Priority	Patients that <b>require prompt medical care within a maximum of four hours</b> to prevent the medical condition from deteriorating to an urgent precedence, prevent unnecessary pain or disability, or provide required treatment not available locally.
III	Routine	Patients who <b>do not require immediate medical attention</b> and whose condition is not expected to deteriorate significantly. <b>Evacuation should be made within 24 hours.</b>
IV	Convenience	Patients for whom <b>evacuation</b> by a medical vehicle <b>is a matter of medical convenience rather than necessity.</b>

**Figure 18. Priority Levels and Criteria for Evacuation Precedence**

## 6. NINE-LINE CASEVAC

A nine-line CASEVAC request is a standard format used by the Armed Forces for coordinating the evacuation of casualties. CASEVAC request transmissions should be made by the most direct communication means available to the medical unit controlling evacuation assets. The means and frequencies used will depend on the organization, availability, and location in the area of operations as well as the distance between units.

The information must be clear, concise, and easily transmitted (see figure 19). This is done by use of the authorized brevity code. The authorized brevity code is a series of phonetic letters, numbers, and basic descriptive terminology used to transmit CASEVAC information. These codes indicate the standard information required for a CASEVAC commonly known as the “Nine-Line.” This message is verbally transmitted in numerical “line” sequence utilizing the following brevity codes:

**Line 1 - Location** - location of the Landing Zone (LZ) where the casualties are to be picked up. This information will be transmitted in the form of an eight digit grid coordinate.

**Line 2 - Radio Frequency, Call Sign** - radio frequency and call sign that will be used by the ground unit at the LZ. You should know this information before every operation.

**Line 3 - Precedence (Urgent, Urgent Surgical, Priority, Routine, Convenience)** - number of casualties by precedence. Use the following codes:

**Alpha** - Urgent

**Bravo** - Urgent Surgical

**Charlie** - Priority

**Delta** - Routine

**Echo** - Convenience

**Line 4 - Special Equipment** - identifies any special equipment that will be needed, such as a hoist in the case where a helo cannot land. Use the following codes:

**Alpha** - None

**Bravo** - Hoist

**Charlie** - Extraction equipment

**Delta** - Ventilator

**Line 5 - Number of Patients by Type** - number of patients who are ambulatory and the number of litter patients. This determines whether or not the helo should be configured to carry litters. Use the following codes:

**Lima** - Litter patients

**Alpha** - Ambulatory patients

**Line 6 - Security of Pickup Site** - whether or not the enemy is near the LZ. If all of your casualties are routine and the LZ is not secured, then your requested CASEVAC may not be approved. Use the following codes:

**November** - No enemy troops in area

**Papa** - Possible enemy troops (approach with caution)

**Echo** - Enemy troops in area (approach with caution)

**X-Ray** - Enemy troops in area (armed escort required)

**Line 7 - Method of Marking Pickup Site** - method that you will use to mark your LZ and then ask the pilot to identify. Use the following codes:

- Alpha** - Panels
- Bravo** - Pyrotechnic signal
- Charlie** - Smoke signal
- Delta** - None
- Echo** - Other

**Line 8 – Patients’ Nationality and Status** - patients’ nationality and status. Use the following codes:

- Alpha** - US military
- Bravo** - US civilian
- Charlie** - non US military
- Delta** - non US civilian
- Echo** - enemy prisoner of war

**Line 9 - NBC Contamination** - whether the LZ has been contaminated with NBC agents. Use the following codes:

- November** - Nuclear
- Bravo** - Biological
- Charlie** - Chemical

Example: During a routine patrol your platoon takes two casualties. One receives a gunshot wound to his right arm. The other receives a gunshot wound to his abdomen and has signs and symptoms of shock associated with internal hemorrhage. While you perform initial treatment, members of your platoon determine that the closest potential landing zone for a helicopter is 300 feet to the West. Its grid location on the map is DH 1234 5678. Your call sign is Blue Thunder and your unit is operating on the frequency 99.65. Your unit commander informs you that the site is secure and will be marked with green smoke. The following would be your nine line radio CASEVAC Request transmission:

**Line 1:** DH 12345678

**Line 2:** 99.65 Blue Thunder

**Line 3:** 1 Bravo, 1 Charlie

**Line 4:** Alpha

**Line 5:** 1 Lima, 1 Alpha

**Line 6:** November

**Line 7:** Charlie

**Line 8:** 2 Alpha

**Line 9:** None

**Figure 19. Nine-Line Casualty Evacuation Request Example**

REV: July 2008

**UNITED STATES MARINE CORPS**  
**FIELD MEDICAL TRAINING BATTALION**  
Camp Pendleton, CA

**FMSO 1501**

**Direct Unit Level Health Service Support**

**TERMINAL LEARNING OBJECTIVE**

1. Given a military environment direct unit level health service support to support mission requirements, per the reference. (FMSO-HSS-1501)

**ENABLING LEARNING OBJECTIVES**

1. 1. Without the aid of references, given a description or title, identify the organic medical support of the subordinate units within a Ground Combat Element, to a accuracy of eighty percent, per the MCWP 4-11.1. (FMSO-HSS-1501a)
2. Without the aid of references, given a description or title, identify the medical support of the subordinate units of a Air Combat Element Group provided to the MAGTF, to a accuracy of eighty percent, per the MCWP 4-11.1. (FMSO-HSS-1501b)
3. Without the aid of references, given a description or title, identify the organizational medical support of the subordinate units within a Logistics Combat Element, to a accuracy of eighty percent, per the MCWP 4-11.1. (FMSO-HSS-1501c)
4. Without the aid of references, given a description or title, identify the mission of the aid station, to a accuracy of eighty percent, per the MCWP 4-11.1. (FMSO-HSS-1501d)
5. Without the aid of references, given a description or title, identify aid station logistics, to a accuracy of eighty percent, per the JT PUB 4-02.1 (FMSO-HSS-1501e)

## **INTRODUCTION**

### **MISSION OF THE MEDICAL DEPARTMENT**

The primary mission of medical and dental units supporting the Marine Corps Operating Forces is the conservation of the combat power of the troops. This is accomplished through measures designed to safeguard the health of the Force through early effective care of the sick and injured, prompt and appropriate evacuation of casualties, and through diligent health/risk surveillance and preventive medicine strategies.

There are health service support personnel and equipment organic to each of these MAGTF components. Each health service support element is sized and equipped appropriately to support the personnel and mission requirements, when assigned to a MAGTF.

### **1. HEALTH SERVICES SUPPORT - GROUND COMBAT ELEMENT (GCE):**

a. The Ground Combat Element of a MAGTF is comprised of Marine Division units sized to the mission:

(1) The Division Command Element Medical Staff consists of the Division Surgeon, a Psychiatrist, a Medical Administrative Officer, an Environmental Health Officer, and enlisted staff to provide administrative support, training, and Senior Enlisted Leadership to all subordinate medical personnel within the Division.

(2) The Division Surgeon functions as a special staff officer, advising the Division Commander on all matters relating to the health of the Division, including the health service support requirements and allocation of medical resources.

(3) The Regimental Command Element Medical Staff consists of the Regimental Surgeon, and a number of Hospital Corpsmen. This section makes up the Regimental Aid Station and provides medical support to Regimental Headquarters personnel.

(a) The Regimental Surgeon is a special staff officer who reports to and advises the Regimental Commander in matters concerning health services of the Regiment.

(b) The Medical Staff of an Infantry Battalion consists of two Medical Officers and sixty-five Hospital Corpsmen. They make up the Battalion Medical Platoon.

(c) One of the two Medical Officers in an Infantry Battalion is designated as the Battalion Surgeon. The Battalion Surgeon is a special staff officer who advises the Battalion Commander on matters pertaining to the health of the Battalion. The duties of the Battalion Surgeon include supervising patient

treatment, planning, organizing, training the Battalion Medical Staff, and performing such other duties as the Battalion Commander may direct.

(d) The other Medical Officer in an Infantry Battalion is designated as the Assistant Battalion Surgeon. The primary job of the Assistant Battalion Surgeon is to direct, manage, and supervise the operation of the Battalion Aid Station (BAS), and to perform such additional duties as may be assigned by the Battalion Surgeon.

(e) Twenty-one of the sixty-five Hospital Corpsmen in an Infantry Battalion are assigned to the Battalion Aid Station (BAS), under the supervision of the Assistant Battalion Surgeon. This group of twenty-one Hospital Corpsmen is called the Aid Station Group. The Aid Station Group is capable of splitting into two sections to operate two separate Battalion Aid Stations when necessary. The Battalion Surgeon will normally head the second aid station.

(f) The remaining forty-four Hospital Corpsmen assigned to the Battalion Medical Platoon are divided into four groups of eleven Corpsmen called Company Medical Teams. One Medical Team is assigned to the Weapons Company and one is assigned to each of the three Rifle Companies of an Infantry Battalion.

(g) The Senior Hospital Corpsman from each Medical Team is designated as the Company Corpsman and is assigned to the Company Headquarters. The remaining corpsmen assigned to a company are designated Platoon Corpsmen.

(h) A Litter Bearer Group also operates under the supervision of the Battalion Surgeon. Litter Bearers are not part of the Battalion Medical Section, they are Marine Corps personnel assigned by the Battalion or Regimental Commander. Litter bearers should be designated well in advance of operations so that they may be trained in the proper techniques of casualty handling.

## **2. HEALTH SERVICE SUPPORT - AVIATION COMBAT ELEMENT (ACE)**

1. The Aviation Combat Element of a MAGTF is comprised of Marine Aircraft Wing units (Fixed Wing and/or Rotary Wing) to support the appropriate mission.
2. The Wing Command Element Medical Staff consists of the Wing Medical Officer or Wing Surgeon, a Medical Administrative Officer, an Environmental Health Officer, an Industrial Hygienist and enlisted personnel as assigned.
  - a. The Wing Medical Officer or Wing Surgeon functions as a special staff officer, advising the Wing Commander on all matters relating to the health of the Wing, including the development of medical policies for the Wing, training of medical and non-medical personnel, health service support requirements, and allocation of medical resources.
  - b. The remainder of the Wing Surgeon's Staff is responsible for medical

planning, logistics, coordination of administrative functions, maintenance of records, and personnel administration.

3. A Group Medical Section for each Marine Air Group (MAG) consists of a Medical Officer and Hospital Corpsmen. The MAG Medical Officer carries out the Wing Surgeon's policies, performs his duties in support of the MAG personnel and is a special advisor to the Marine Air Group Commander.
  - a. The Marine Wing Support Group includes four Marine Wing Support Squadrons (MWSS), with organic (from the unit), medical assets consisting of medical officers, hospital corpsmen, and the equipment and supplies to establish a Squadron Aid Station. The MWSS Aid Station is capable of providing routine sick call, aviation medicine, preventive medicine, laboratory, radiology, and pharmacy services.
4. Each flying squadron within a Marine Aircraft Group has a medical section consisting of a Flight Surgeon and a number of Hospital Corpsmen depending on squadron type. The Squadron Medical Section conducts routine sick call and other aviation medical functions.
5. In order to centralize organization and support, squadron medical personnel normally work in conjunction with the Marine Wing Support Squadron (MWSS) Aid Station.

**TRANSITION:** We've just discussed the HSSE of the Aviation combat element are there any questions? **QUESTION:** How many HM's are assigned to a squadron?  
**ANSWER:** 3-4. Now let's talk about the Logistical Combat element.

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#### **D. HEALTH SERVICES SUPPORT – LOGISTIC COMBAT ELEMENT (LCE):**

1. The Logistic Combat Element of a MAGTF is developed around units from a Marine Logistics Group (MLG).
2. The Marine Logistics Group (MLG) Command Element Medical Staff consists of the Group Surgeon and a number of personnel making up the Group Aid Station (GAS) and the Health Service Support Element (HSSE).
  - a. The Group Surgeon functions as a special staff officer advising the MLG Commander on all matters relating to the health of the MLG. The Group Surgeon also supervises the operations of the Group Aid Station.
  - b. The Group Aid Station (GAS) provides internal health service support to the MLG units.
  - c. The Health Service Support Element (HSSE) coordinates the

requirements for health service support and Class VIII supplies required above the organic capabilities of the Ground Combat Element (GCE) and the Aviation Combat Element (ACE).

3. The Medical Battalion of the Marine Logistics Group is the primary source of health service support above the Battalion Aid Station, which is provided by and organic to the Ground Combat Element. It provides initial resuscitative care and temporary holding of casualties. The Medical Battalion is made up of a Headquarters and Service (H&S) Company and three Surgical Companies.
  - a. The Headquarters and Service Company includes an administration and personnel section, intelligence, and operations section, a logistics section, a communications section, a chaplain's section, a preventive medicine section, eight Shock and Trauma Platoons (STP) fourteen Forward Resuscitative Surgery Systems (FRSS)
    - 1) The Shock and Trauma Platoon provides comprehensive, mobile health service support to a Ground Combat Element (GCE) Battalion Aid Station (BAS.) Each platoon consists of a Stabilization Section and a Collecting and Evacuation Section.
      - a) The Stabilization Section of an STP consists of two Medical Officers, a Physician Assistant, and 7 HM 8404's. The Stabilization Section is highly mobile and is capable of providing advanced trauma life support.
      - b) The Collecting and Evacuation Section of an STP consists of a Nurse Corps officer, 1 IDC HM, 3 HM 8404's and 10 Marine Corps motor vehicle and radio operators. The mission of the Collecting and Evacuation Section is to collect and transfer casualties as well as provide advanced trauma life support.
    - 2) The Forward Resuscitative Surgery System (FRSS) provides comprehensive, mobile health service support to a Ground Combat Element (GCE) Battalion Aid Station (BAS.)
      - a) The Forward Resuscitative Surgery System (FRSS) consist of two General Surgeons, one Anesthesiologist, one Critical Care Nurse, one IDC(8425), two OR techs (HM) and one HM (8404)

- b. The Surgical Companies provide general health service support including medical and surgical care and temporary holding of casualties. Each Surgical Company consists of a Headquarters Platoon, a Triage/Evacuation Platoon, a Surgical Platoon, Holding Platoon, Combat Stress Platoon, and Ancillary Service Platoon.
          - 1) The Surgical Platoon consists of three Surgical Sections (Total of 3 OR's).
          - 2) The Holding Platoon contains three ward sections (Twenty beds each).
          - 3) The Ancillary Platoon contains two laboratory sections, two pharmacy sections, and two X-ray sections.
4. The Supply Battalion of the Marine Logistics Group includes a Medical Logistics (MEDLOG) Company, which is responsible for the day-to-day management and maintenance of Class VIII supplies.
- a. MEDLOG Company provides intermediate 3rd and 4th Echelon maintenance of medical and dental equipment for health service support elements of the MAGTF.
  - b. The Medical Logistics Company consists of a company Headquarters and Equipment Repair Platoon, and three Supply Platoons.
    - 1) The Company Headquarters consists of a Company Commander, Executive Officer and 8 Navy and Marine Corps enlisted assistants.
    - 2) The Equipment Repair Platoon consists of 9 Hospital Corpsmen, Biomedical Repair Technicians and two Dental Technician Repairmen. The Equipment Repair Platoon is capable of operating in a centralized repair site and/or providing contact team maintenance in the field.
      - 1. Each of the three Supply Platoons consists of one supply officer, 16 Hospital Corpsmen, one Dental Technician and 4 Marine supply personnel. The Supply Platoon provides for the receipt, storage and issue of all Class VIII supplies. The Supply Platoons can operate as a unit or separate into three balanced units in support of a MAGTF.
5. The Dental Battalion of the Marine Logistics Group provides for maintenance and emergency dental care, and specialized care of casualties

with maxillofacial injuries. The battalion is composed of approximately 70 Dental Corps Officers, two Medical Service Corps Officers, 125 Dental Technicians, and 4 enlisted Marine Corps personnel. The Dental Battalion includes a Headquarters and Service Company and three Dental Companies.

- a. The Headquarters and Service Company provides command, administrative and supply services for the battalion.
  - b. Each Dental Company consists of a Headquarters Section, which includes the Company Commander, the Executive Officer, enlisted assistants and a Clinical Section consisting of an Oral Surgeon, a Prosthetics Officer, an Endodontics Officer, Assistant Dental Officers and a number of Dental Technicians.
  - c. The organization and equipment of a Dental Company is designed to permit a large degree of flexibility and mobility. Detachments of varying sizes may be formed for assignment to separate or independent units.
6. A Dental Detachment may be attached to each Surgical Company of the MLG. This detachment is equipped and staffed to provide for routine dental care but may be used to assist medical personnel in the event of mass casualties.

**TRANSITION:** We've just discussed the HSSE of the Logistical combat element are there any questions? **QUESTION:** The dental battalion of MLG has how many dental Corps officers? **ANSWER:** 70. Now let's talk about the mission of the aid station.

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#### **E . MISSION OF THE AID STATION**

1. To provide direct medical support to company and platoon corpsmen, and to provide an advanced level of care in the overall effort to sustain the combat force.
2. Areas of Responsibility -all medical personnel assigned to the BAS are responsible for performing the following duties:
  - (1) Conduct sick call
  - (2) Administration
  - (3) Supply
  - (4) Medical readiness – physicals and exams
  - (5) Pre-deployment Preventive Medicine Programs
  - (6) Triage, treat, and casevac trauma patients as indicated

- (7) Provide medical coverage as needed to requesting units
- (8) Provide for patient privacy and confidentiality
- (9) Provide training to non-medical personnel to enhance Combat Lifesaver (self-aid) and litter team responsibilities.

**TRANSITION:** We've just discussed the mission of the aid station are there any questions? **QUESTION:** Training should be provided by the aid station to non-medical personnel in what? **ANSWER:** Combat Lifesaver, now let's talk about aid station logistics.

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## **F. AID STATION LOGISTICS**

Logistics is that military specialty dealing with the procurement, storage, distribution, inventory, and maintenance of material. Supplies and equipment are divided into ten classes for management purposes. Class VIII is assigned to medically related items. Careful consideration should be given to stock levels of Class VIII materials (consumable and equipment) so as not to overstock.

### **a. Supply Terminology**

1. Table of Equipment (T/E) - The MAGTF surgeon will advise on all matters regarding medical and dental support. Allocations of materials are documented in the table of equipment (T/E). The total HSS T/E is designed to support a Marine Expeditionary Force (MEF) in an estimated worst-case scenario for a 60-day period of combat. A unit's T/E includes items necessary for basic support of the organization and include:

- (a) Tentage
- (b) Vehicles
- (c) Tools
- (d) Communication equipment
- (e) Nuclear, biological and chemical (NBC) gear
- (f) Office equipment and supplies

2. Authorized Medical Allowance List (AMAL) - A list of authorized allowances of equipment and consumable supplies required to perform operational HSS. There are two types:

- (g) Equipment - These are non-consumable materials, such as litter supports, stretchers, oxygen regulators, etc., that are required to perform a specific medical function.
- (h) Supplies - These consist of consumable line items that are provided in quantities required to support a predetermined patient load associated with a specific echelon of medical treatment.

3. Authorized Dental Allowance List (ADAL) - A list of authorized allowances of equipment and consumable supplies required to perform a dental function. As with the AMAL, there are two types and they are the same as previously mentioned.

4. DD-1348 - A form used to requisition materials. It is used primarily by the battalion corpsman in ordering supplies by line item only, e.g., IV fluids, bandages, splints, etc., to re-stock the equipment and consumable AMAL/ADAL.

5. Line items - An item having a National Stock Number (NSN)

6. Naval Medical and Dental Material Bulletin (NMDMB) - A monthly publication which provides information on drugs, supplies, equipment and authorizes additions or deletions to the AMALs and ADALs. It also provides information on expiration dates, defective materials, and disposition instructions.

**TRANSITION:** We've just discussed aid station logistics are there any questions?

**QUESTION:** What does AMAL stands for ? **ANSWER:** Authorized Medical Allowance List, now let's summarize.

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### **SUMMARY:**

During this period of instruction we have covered the mission of the medical department, HSS of each element, identified the mission of the Aid Station, and explained Aid station logistics By applying this knowledge you will have a better understanding of unit level support within the Marine Corps . At this time those with IRF's fill them out. When they are done take 10 minute break.



**UNITED STATES MARINE CORPS  
FIELD MEDICAL TRAINING BATTALION  
Camp Pendleton, CA**

**FMSO 1605**

**Manage Force Health Protection for Military Operations**

**TERMINAL LEARNING OBJECTIVE.**

1. Given the requirement in a tactical environment, access to automated systems and applicable software and equipment and supplies, manage force health protection for military operations to eighty percent accuracy.  
(FMSO-FP-1605)

**ENABLING LEARNING OBJECTIVES**

1. Without the aid of reference, given a description or list, describe the procedure on prevention of common foot disorders to an eighty percent accuracy, per Foot Marches, FM 21-18. (FMSO-FP-1604a)
2. Without the aid of reference, given a description or list, identify deployment health risks to an eighty percent accuracy, per Navy and Marine Corps Public Health Center website.  
(FMSO-FP-1605b)
3. Without the aid of reference, given a description or list, identify the force health protection requirement for military personnel to an eighty percent accuracy, per BUMEDINST 6230.15.  
(FMSO-FP-1605c)
4. Without the aid of reference, given a description or list, describe the deployment health assessment procedures to an eighty percent accuracy, per Department of the Navy Instruction 6490.03. (FMSO-FP-1605d)

## **1. PREVENTION OF COMMON FOOT DISORDERS**

a. Improperly fitting boots and socks are common causes of foot problems such as blisters, corns and calluses. Improper foot hygiene will also lead to foot disorders such as ingrown toenail and athlete's foot.

b. Carefully fit new boots.

- (1) Bring a pair of socks/orthotics you intend to wear with the boots to the store.
- (2) The toe box should be roomy enough so you can wiggle your toes.
- (3) The ball of your foot should rest on the widest part of the sole.
- (4) The forefoot should not be wider than the boot.
- (5) Determine the boot length, there should be a ½ inch between the end of the longest toe and the end of the boot.
- (6) Wear clean, dry, un-mended, well fitting socks.
- (7) Socks should fit snugly on the foot without excess material over toes and the heel.
- (8) If a person wants to wear two pairs of socks, the outer pair should be ½ size larger to comfortably fit over the inner sock.

c. Use the following preventive measures to educate and supervise personnel on proper foot care and wear.

- (1) Keep feet clean and dry.
- (2) Wear shower shoes when using public showers.
- (3) Trim nails straight across, and not too short. Don't cut out or dig at corners.
- (4) Use foot powder to keep feet dry.
- (5) During marches, lie with feet elevated at rest points, if time permits, massage the feet, apply foot powder and change to dry socks.
- (6) Relief from swelling feet can be obtained by slightly loosening the bootlaces where they cross the arch.
- (7) EARLY ATTENTION IS ESSENTIAL. Treat blisters, abrasions, corns, and calluses if they have occurred.
- (8) After the hike, if red, swollen, tender skin develops along the edges of the foot, the foot requires aeration, elevation, rest and as a rule wider foot wear .

## 2. DEPLOYMENT HEALTH RISKS

### a. Environmental Issues

(1) Air Quality contamination has minimal health effects. The primary sources of air contamination are petroleum refineries, petrochemical and fertilizer plants, cement facilities, power plants, vehicle exhaust and naturally occurring sand and dust. Exposure presents a risk of temporary respiratory symptoms such as coughing, wheezing and reduced lung function.

(2) Soil contamination is localized to specific areas surrounding industrial facilities, waste disposal sites and open sewage ditches. Significant exposure to contaminants in soil is unlikely in the absence of windblown dust, active digging, or migration of contaminants from the soil into groundwater. As a result, soil contamination usually presents a low risk to human health.

(3) Drinking Water contamination is one of the most significant health threats to deployed personnel. Inadequately treated domestic and industrial liquid and solid waste, deteriorated water treatment and distribution systems, excessive use of fertilizers and pesticides, and improper disposal of waste oils contribute to water contamination. Consumption of water contaminated with raw sewage or runoff containing fecal pathogens may cause a variety of acute enteric infections.

### b. Infectious Diseases

#### (1) Food-borne and Water-borne Diseases

(a) High Risk (Diarrhea, Hepatitis and Typhoid Fever)

(b) Intermediate Risk (Brucellosis, Cholera and Hepatitis E, leptospirosis)

(c) Preventive measures

1. Consume food, water, and ice only from US-approved sources.
2. Test and decontaminate water supply prior to use.
3. Wash your hands after using latrines and before eating (hand washing stations should be near latrines and dining facilities).
4. Avoid unnecessary contact with lakes, rivers, streams and other surface water.

#### (2) Vector-borne Diseases

(a) High Risk (Malaria)

(b) Intermediate Risk (Leishmaniasis, Crimean-congo hemorrhagic fever, Sand-Fly fever, typhus, West Nile fever)

(c) Preventive measures

1. Use DEET-based insect repellent.
2. Treat field uniforms with permethrin. Always wear sleeves down in a field environment.
3. Use bed nets (treated with permethrin) in field condition.
4. Take your Malaria chemoprophylaxis as directed.

(3) Animal-contact Diseases

(a) High Risk (Rabies)

(b) Intermediate Risk (Anthrax, Q- fever)

(c) Preventive measures

1. Avoid animal contact, especially if the animal exhibits strange behavior.
2. No mascots.
3. Report all animal bites and scratches.

(4) Sexually Transmitted Diseases

(a) Intermediate Risk (Gonorrhea, Chlamydia, HIV and Hepatitis B)

(b) Preventive measures

1. Refrain from any sexual activity while on deployment (Adhere to the General Order 1 regarding this issue).

(5) Respiratory Diseases

(a) Intermediate Risk (Tuberculosis)

(b) Preventive measures

1. Tuberculin Skin Test before and after deployment.
2. 72 sq ft/person and head to toe sleeping arrangement.
3. Cough and sneeze into upper sleeve instead of your hands.
4. Wash hands at every opportunity.
5. Avoid close contact with local population.

c. Other Health Hazards

(1) Hazardous Plants and Animals

(a) Plants (Mexican poppy, Fetid Nightshade)

(b) Animals (Rabid dogs, poisonous snakes, centipedes, scorpions and spiders)

(c) Preventive measure

1. Do not handle or feed animals.
2. Shake out boots, clothing and bedding prior to use and never walk barefoot.
3. Avoid sleeping on the ground.
4. Do not touch, chew, eat, or burn unfamiliar plants.
5. Decontaminate clothing by washing with soap and water after contact with harmful plants.

3. **FORCE HEALTH PROTECTION**

Inadequate Force Health Protection (FHP) measures, will place service members at risk and seriously jeopardize mission effectiveness.

a. Unit Immunization Program

Vaccinations are a way of life in the US military. All new recruits (both Officers and Enlisted) are vaccinated against various diseases during enlisted basic training or during officer accession training. Sailors and Marines should have immunization status reviewed as part of a routine sick call visit on their birth month for immunization update as well as for pre-deployment preparation. Annual HIV and PPD testing will be completed as well as other boosters.

<b>Immunizing Agent</b>	<b>Remarks</b>
<b>Basic Training and Officer Accession Training</b>	
Adenovirus, Types 4 and 7	Air Force recruits receive adenovirus vaccination only when there is evidence of active disease transmission. Coast Guard Recruits only receive this when specifically directed by the Coast Guard Commandant.
Influenza (Flu Shot)	Navy and Marine Corps officer and enlisted accessions receive the influenza vaccine year round in basic training. Given annually during the designated flu season (October - March)
Measles/Mumps and Rubella	Measles Mumps and Rubella (MMR) are administered to all recruits regardless of prior history.
Meningococcal	Quadrivalent meningococcal vaccine (containing A, C, Y, and W-135)

	polysaccharide antigens) is administered on a one-time basis to recruits. The vaccine is given as soon as practicable after in-processing or training.
Polio	A single dose of trivalent OPV is administered to all enlisted accessions. Officer candidates, ROTC cadets, and other Reserve Components on initial active duty for training receive a single dose of OPV unless prior booster immunization as an adult is documented.
Tetanus-diphtheria	A primary series of tetanus-diphtheria (Td) toxoid is initiated for all recruits lacking a reliable history of prior immunization in accordance with existing ACIP guidelines. Individuals with previous history of Td immunization receive a booster dose upon entry to active duty and subsequently in accordance with ACIP requirements. Booster every 10 years.
Yellow Fever	Booster every 10 years
<b>Alert Forces (See Remarks below for definition of "Alert Forces)</b>	
Hepatitis A	Two series shot at 0 and 6 months.
Typhoid	Typhoid vaccine is administered to alert forces and personnel deploying to endemic areas, booster is every 2 years.
<b>When Deploying or Traveling to High Risk Areas</b>	
JE Vaccine (Japanese B Encephalitis)	3 series shot at 0, 14 days and 30 days, booster every 3 years
<b>When Required by Host Country to Enter</b>	
Cholera	Cholera vaccine is not administered routinely to either active or reserve component personnel. Cholera vaccine is administered to military personnel, only upon travel or deployment to countries requiring cholera vaccination as a condition for entry, or upon the direction of the appropriate Surgeon General, or Commandant (G-K), Coast Guard.
<b>High Risk Occupational Groups</b>	
Hepatitis B	
Plague	There is no requirement for routine immunization. Plague vaccine is administered to personnel who are likely to be assigned to areas where the risk of endemic transmission or other exposure is high.
Rabies	Rabies vaccine is administered to personnel with a high risk of exposure (animal handlers; certain laboratory, field, and security personnel; and personnel frequently exposed to potentially rabid animals in a non occupational or recreational setting).
<b>When Deployed to Area Where In-Theater Commander Accesses a Biological Threat</b>	
Small Pox	This vaccine is administered only under the authority of DOD Directive 6205.3, <i>DOD Immunization Program for Biological Warfare Defense</i> .
Anthrax	This vaccine is administered only under the authority of DOD Directive 6205.3, <i>DOD Immunization Program for Biological Warfare Defense</i> .

### 3. DEPLOYMENT HEALTH ASSESSMENT

a. The DOD Components implement a comprehensive deployment health program, which effectively anticipates, recognizes, evaluates, controls, and mitigates health threats encountered during deployments. Deployment is characterized as the relocation of forces and materiel to desired operational areas. Deployment encompasses all activities from origin or home station through destination, specifically including intra-continental United States, inter-theater, and intra-theater movement legs, staging, and holding areas. Health risk assessments are conducted to anticipate, identify, and assess health threats, develop controls and countermeasures, make risk decisions, and implement controls to mitigate unavoidable health threats.

b. Health risk assessments use information from sources such as Office of Environmental Health(OEH) site assessments, Preliminary Hazard Assessments (PLHAs), industrial hazard assessments, environmental baseline surveys, health surveillance activities, medical intelligence products, lessons learned, and other available data for the deployment area. At the minimum, consult the Services' deployment health surveillance support hubs such as the Air Force Institute for Operational Health, Navy Environmental Health Center, and U.S. Army Center for Health Promotion and Preventive Medicine for deployment OEH historical exposure and monitoring data, and mission and site information, Armed Forces Medical Intelligence Center (AFMIC) (via supporting intelligence office or organization) for current intelligence on foreign medical capabilities, infectious disease threats, environmental health risks, toxic industrial chemical threats, and developments in biotechnology and biomedical subjects of military importance; DOD Veterinary Service Activity for food and bottled water sanitation audit information, and the Defense Pest Management Information Analysis Center, for information on animals and plants that may impact the DOD mission. Other sources of information to be considered include the World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), and the National Institutes of Health (NIH).

#### c. Pre-Deployment Health Assessment Requirements

(1) Pre-Deployment Phase - Pre-deployment health activities are based on DOD and Service policies and the health risk assessments for the joint operations area or area of operations and for the specific deployment location. An overall health risk assessment for the joint operations area or area of operations must be accomplished before each deployment to identify the deployment-specific health threats and appropriate protective measures, and determine the content of health risk communication messages and materials, including pre-deployment health threat briefings. Specific health risk countermeasures (immunizations, prophylactic medications, or personal protective equipment) will be based on the health threats or potential health threats.

The following pre-deployment health activities are required for all deployments:

(a) Administer deployment-specific immunizations, prophylaxis, and other medical countermeasures. Health care providers shall record serious adverse events in medical

records and shall report serious adverse events to the Adverse Events Reporting System of the Department of Health and Human Services using the Food and Drug Administration MEDWATCH or Vaccine Adverse Event Reporting System procedures and forms.

(b) Tuberculosis screening shall be based on the potential of a high-risk exposure to tuberculosis or per Combatant Commander or Service Component policy.

(c) Pre-deployment serum specimens must be collected within one year of deployment. The most recent serum sample, including a post-deployment serum sample or Human Immunodeficiency Virus (HIV) sample collected within the previous 365 days may serve as a pre-deployment serum sample. Individuals must be informed if their pre-deployment serum sample will be tested for HIV.

(d). Prescription medications, minimum 90-day supply of prescription medications, other than Force Health Protection Prescription Products, is required for all deployments.

(e) The current deployment health record (DD Form 2766 or equivalent) for each deploying individual must reflect Blood type/Rh factor; Prescribed medications and/or allergies, corrective lens prescription, all immunizations recorded in the Services' electronic immunization tracking database and the patient deployment health record (this may be accomplished using a computer-generated record). The following information must be included: type of immunization, date administered, dose, and vaccine administrator identifying information such as their initials.

(f) Prescribe any necessary Force Health Protection Prescription Product (FHPPP). Certain drugs, vaccines, and other medical products are useful for protecting the health of deployed personnel that may be used only under a physician's prescription.

(g) Issue personal protective equipment as required by occupational specialty or threat to deploying personnel.

(h) Conduct health threat briefings whenever health threats are identified and/or protective measures are required. The briefing addresses topics such as endemic diseases, hazardous plants and animals, entomological hazards, CBRN agents, toxic industrial chemicals and materials (agricultural and industrial), deployment-related stress, and climatic or environmental extremes (e.g., heat, cold, high altitude, wind-blown sand and/or other particulates).

(i) DD Forms 2795, "Pre-Deployment Health Assessment," if required, are submitted to the Defense Medical Surveillance System (DMSS), which are maintained by the Army Medical Surveillance Activity, U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM).

(2) Deployment Phase - The deployment phase begins when advanced party or initial cadre personnel arrive into the deployment area.

d. Post-Deployment Health Assessment Requirements

(1) Exposure to environmental health threats may have acute, chronic, or latent effects, and, when indicated, long-term medical surveillance should be conducted to detect latent diseases. Health surveillance data are used to document any occurrence of disease or health outcomes due to exposures, conduct epidemiological investigations, determine new prevention strategies and countermeasures for current or future deployments, and develop health risk communication materials.

The following post-deployment health activities are required for all deployments:

(a) Tuberculosis screening shall be based on the potential of a high-risk exposure to tuberculosis.

(b) As part of the re-deployment process, when required, a serum sample shall be obtained from each individual no later than 30 days after arrival at the demobilization site, home station, or in-patient medical treatment facility (preferably during the face-to-face health assessment) and forwarded to the DOD Serum Repository using the existing trans-shipment centers. Serum samples for personnel separating from active duty, including Reserve Component members who are demobilizing, should be obtained during demobilization. Individuals must be informed if the post-deployment serum sample will be tested for HIV.

(c) A health threat de-briefing must be provided to re-deploying or re-deployed DOD personnel during in-theater medical out-processing or following a deployment. Post-deployment health debriefings inform personnel of any health-related medical, occupational, environmental, or CBRN exposures that they may have experienced, address individual concerns and information about required medical follow-up, and help personnel reintegrate and adjust back to routine activities following a deployment.

(d) DD Forms 2796, "Post-Deployment Health Assessment," if required, are completed and submitted to DMSS. Provide a face-to-face health assessment with a trained health care provider for redeploying personnel who are required to complete a DD Form 2796. As appropriate, schedule medical and dental referrals and follow-up visits for health concerns or issues.

(e) Reserve Component members will receive medical and dental care and disability evaluations according to DOD Directive 1241.1 prior to the release of the member from active duty. If the member does not stay on active duty, ensure arrangements are made for medical and dental care after being released.

e. Post-Deployment Health Re-Assessment Requirements

(1) A post-deployment re-assessment will be administered to each re-deployed individual within 90 to 180 days after return to home station from a deployment.

The following post-deployment health activities are required for all deployments:

(a) Complete DD Forms 2900, "Post-Deployment Health Reassessment (PDHRA)," when required.

(b) For individuals who received wounds or injuries that required hospitalization or extended treatment before returning to home station, the reassessment will be administered 90 to 180 days following their return home. After the DD Form 2900 is completed, a trained health care provider will discuss health concerns indicated on the form and determine if referrals are required. Educate individuals on post-deployment health re-adjustment issues and provide information on resources available for assistance. The original of the completed DD Form 2900 must be placed in the deployed individual's permanent medical record. Submit copies of the completed DD Forms 2900 electronically to the DMSS. Services may require submission of the forms to DMSS via their surveillance hubs.

**UNITED STATES MARINE CORPS  
FIELD MEDICAL TRAINING BATTALION  
Camp Pendleton, CA**

**FMSO 1701**

**Provide Health Service Administrative Support**

**TERMINAL LEARNING OBJECTIVE**

1. Given the requirement, necessary records, forms and the references, perform administrative procedures to ensure mission essential medical administrative functions within the unit are met. (FMSO-HSS-1701)

**ENABLING LEARNING OBJECTIVES**

1. Without the aid of reference, given a description or list, describe the proper procedure to initiate Light Duty to an eighty percent accuracy, per MANMED P-117, Chapter 18. (FMSO-HSS-1701a)

2. Without the aid of reference, given a description or list, describe the proper procedure to initiate a Limited Duty Board to an eighty percent accuracy, per MANMED P-117, Chapter 18 (FMSO-HSS-1701b)

3. Without the aid of reference, given a description or list, describe the proper procedure to initiate a Physical Evaluation Board to an eighty percent accuracy, per MANMED P-117, Chapter 18. (FMSO-HSS-1701c)

4. Without the aid of reference, given a description or list, identify Special Duty Examinations conducted for Navy and Marine Corps personnel to an eighty percent accuracy, per MANMED P-117, Chapter 15 (FMSO-HSS-1701d)

5. Without the aid of reference, given a description or list, identify appropriate Marine Corps Inspection Programs to an eighty percent accuracy, per NAVMC DIRECTIVE 5040.6H (FMSO-HSS-1701e)

6. Without the aid of reference, given a description or list, describe the proper procedure on how to write an Evaluation/Fitness Report and Counseling Record to an eighty percent accuracy, per BUPERSINST 1610.10A (FMSO-HSS-1701f)

7. Without the aid of reference, given a description or list, describe the proper procedure on how to process Navy and Marine Corps Award nominations to an eighty percent accuracy, per SECNAVINST 1650.1G (FMSO-HSS-1701g)

**INTRODUCTION:** Fitness is primarily a term that relates to the disability evaluation. Members who have a temporary medical condition that limits their ability to perform certain activities should be referred to appropriate specialists for definitive diagnosis, treatment, and preparation of a medical board, if necessary.

1. **LIGHT DUTY:**

a. Light duty is a period when the member reports to his/her work space, but during this period the member is excused from the performance of certain aspects of military duties, as defined in their individual Light Duty write-up. Any credentialed health care provider may recommend a member for Light Duty. Light Duty will be ordered in periods not to exceed 30 days to ensure appropriate patient clinical oversight, however, consecutive Light Duty for any “new condition” up to 90 days may be ordered by the provider (in maximum 30 day periods), but in no case will Light Duty exceed 90 consecutive days. At the end of the light duty period, the member will either be returned to unrestricted duty or will be referred to a Medical Evaluation Board (MEB). If a member is not expected to return to full duty by the end of the 90 day period of Light Duty, then at the end of 60 days, a Limited Duty Board shall be initiated. The member may be retained in a Light Duty status for an additional 30 days to allow for the processing of a Limited Duty Board.

(1) A health care provider recommending a member for light duty will complete NAVMED 6310/1, Individual Sick Slip, clearly annotating the restrictions and limitations imposed upon the member’s duty, as well as the time period required in a Light Duty status.

(a) Original will be placed in the member’s health record.

(b) One copy will be given to the member’s command.

(c) Third copy will be retained by the MTF/DTF for record keeping.

2. **LIMITED DUTY:**

a. **Limited Duty (LIMDU)** is a period when a member reports to his/her workspace, but during the period the member is excused from the performance of certain aspects of military duties, as defined in their individual LIMDU write-up. LIMDU is also known as Temporary Limited Duty (TLD). A member should be placed on TLD when the prognosis is that the member can be returned to full duty within a reasonable period of time. For members of the Navy and Marine Corps, the period of TLD shall not exceed 12 months per career, cumulative, before the service member is either referred to the Physical Evaluation Board (PEB) for evaluation and a fitness determination is rendered or is returned to full duty. TLD may be approved for enlisted members at the local MTF for up to 12 months without the approval from service headquarters, but a copy of the board must be forwarded for historical record. A re-evaluation of the member must be made 2 months prior to the completion of any period of LIMDU. If a member is not expected to return to full duty by the end of the 1<sup>st</sup> TLD, then at the 5<sup>th</sup> month, a 2<sup>nd</sup> TLD will be initiated or the member will be referred to

MEB. TLD for officers must be requested and approved by the respective service headquarters. All third or greater, or other TLD period requests resulting from additional medical conditions arising in the member's career, must be submitted for approval to PERS-4821 or HQMC MMSR-4.

(1) A provider recommending a member for LIMDU will complete NAVMED 6100/5, Abbreviated Medical Evaluation Board Report clearly annotating the restrictions and limitations imposed upon the member's duty, as well as the time period required in a Limited Duty status.

(a) Document LIMDU on SF 600 and DD Form 2766

(b) Original NAVMED 6100/5 will be placed in the member's health record to be submitted to the MTF Patient Admin for processing and Approval by Convening Authority.

(c) One copy will be given to the member's command.

(d) Third copy will be retained by the LIMDU Coordinator for record keeping and reporting.

(e) LIMDU will also be recorded and reported electronically through Medical Board Online Triservice Tracking.

(f) At the completion of the Limited Duty, a provider will complete a NAVMED 6100/6, Return of Patient to Medically Unrestricted Duty from Limited Duty. Member can be found fit to return to duty at any period of time or placed on a second period of TLD by attending physician just as long as the period does not exceed 12 months.

b. Convening Authority (CA)- Authority in Navy Medicine to convene Medical Evaluation Boards is granted exclusively to the Commanding Officers of naval medical centers, naval hospitals, naval medical clinics, and the naval ambulatory care centers. Approval from CA is required for a member to be placed on LIMDU and return to Full Duty status prior to becoming effective. Medical Treatment Facilities commanders, may, however consider authorizing their respective branch clinic's clinical staffs to serve as MEB members and to initiate Medical Evaluation Board Report which then must be forwarded to the MTF for processing and CA approval and signature before the MEBR findings or recommendations become effective.

c. Medical Evaluation Board (MEB)- is a panel of providers attached to one of the medical treatment facilities (MTFs) whose commander or commanding officer (CO) has been expressly designated to hold "convening authority". In essence, if a patient has a medical condition which will be responsible for their inability to operate in a medically unrestricted duty status for 90 days or greater duration, the patient must be referred to a MEB. A MEB

evaluates the patient and produces a Medical Evaluation Board Report (MEBR). The purpose of the MEBR is to:

- (1) The Manual of the Medical Department has a complete list of all circumstances and medical conditions indicating need for a referral to a MEB.
- (2) The purpose of the MEBR is to:
  - (a) Place a patient on LIMDU.
  - (b) Verify that the member is “fit for duty,” after being cleared from LIMDU, and should be able to execute the duties of their respective office.
  - (c) Refer a patient to the Physical Evaluation Board (PEB) for a determination of the patient’s fitness for continued service.

d. Convening Medical Boards

- (1) A medical board should be convened when a provider determines that:
  - (a) A service member has a condition that may permanently interfere with his or her ability to fulfill the purpose of service on active duty.
  - (b) A service member is temporarily unable to perform full duty, but return to full duty is anticipated and is necessary to follow the patient for more than 90 days before final disposition is made, i.e. temporary limited duty (TLD) board.
  - (c) The service member’s condition includes the presence of mental incompetency or incapability to manage personal or financial affairs.
  - (d) The service member refuses reasonable medical, dental or surgical treatment and the members ability to perform full duty is suspect.
  - (e) The service member is an inactive reservist with an injury or illness incurred in or aggravated during a period of active service and the period of treatment, rehabilitation, or convalescence is expected to exceed 12 weeks.
  - (f) If member not likely to ever return to full duty.
  - (g) Physician cannot estimate prognosis or outcome for 45 days.
  - (h) Member can return to full duty but in a limited or restricted capacity.
  - (i) Member requires assignment near an MTF with specialty services.
  - (j) Member requires multiple surgeries.

3. **PHYSICAL EVALUATION BOARD (PEB)**

a. The Department of the Navy's disability evaluation system is managed by the Secretary of the Navy Council of Review Boards, PEB. The PEB is an administrative board that determines whether a service member's disability prevents his or her continued performance in the Navy or Marine Corps. The PEB is comprised of two levels of boards, which review medical evidence and make determination of fitness or unfitness to continue naval service. If the PEB determines that a service member is unfit to continue naval service, and finds the service member is eligible for disability benefits, the PEB determines the percentage of the service member's disability compensation. Depending on the severity of the illness or injury, the service member receives either medical retirement or disability severance pay. As stated earlier, the MEB will refer patients to the PEB using the MEBR (NAVMED 6100/5). Under no circumstances will the MEBR prepared by the MTF state that the member is unfit, or provide recommendation for a disability percentage rating. The treatment facility will determine if medical condition is due to an injury requiring a line of duty determination, and inform the member's command if such a requirement exist.

(1) Medical Board Report Preparation

A trained Command Limited Duty Coordinator will be designated in writing as liaison to the MTF Patient Admin with the MEB process. MTFs must have the board report completed, sent to, **and accepted by** the PEB within 30 days of the date of dictation of the MEBR by the attending physician. MTFs must include in their "30-day window" appropriate time periods for MEBR dictation, review, and signature by the MEBR members, and final review and signature by the CA.

(a) A provider recommending a member for MEB for referral to PEB will complete **NAVMED 6100/5, Abbreviated Medical Evaluation Board Report** clearly annotating the restrictions and limitations imposed upon the member's duty.

(b) Immediately upon concluding that a patient is to be referred to a MEB, the attending physician determining the need for the patient's referral, will personally annotate this decision in the patient's medical record on a **SF 600, Chronological Record of Medical Care** and **DD 2766, Adult Preventive and Chronic Care Flowsheet**.

(c) A complete Physical Exam will be conducted within 6 months of the date of the MEBR.

(d) Copies of all narrative summaries of hospitalizations and all procedure reports from Specialty clinics will be submitted with the package (**Addendums**)

(e) A **Non-Medical Assessment (NMA)** is the Commanding Officer's assessment of the member's performance of duty. This document is crucial in summarizing the member's limitations from the perspective of the Commanding Officer. The NMA is one document, comprised of a brief questionnaire along with a narrative summary. Commanders will make sure that NMA is submitted to the requesting facility within 15 calendar days from the date of receipt of such request.

(f) A **Line of Duty Investigation (LODI)** is an inquiry used to determine whether an injury or disease of a member performing military duty was incurred in a duty status, and if not in a duty status, whether it was aggravated by a military duty, and whether incurrence or aggravation was due to the member's intentional misconduct or willful negligence. (if required)

(g) Contents of the MEBR Package will also include:

1. **Dictated Abbreviated Medical Board Report**
2. **NAVMED 6100/1, Medical Board Report Cover Sheet**
3. **NAVMED 6100/2, Medical Board Statement of Patient**
4. **NAVMED 6100/4, Medical Board Certificate Relative to Counseling on Refusal of Surgery and/or Treatment**
5. **Patient Information Sheet**, available electronically

(h) In addition to health record entries, information on each patient referred to a MEB must be entered into the MedBOLTT system (or any system that should replace it). Route the original for appropriate review, action and disposition. Be sure the copy in the medical record is legible and signed.

Note: The Medical Board Online Triservice Tracking (MEDBOLTT) is a Web-based system accessible to those MTFs with CA to perform MEBs. It captures and shares data globally, allowing all MTFs with CA to research, for any patient referred to a MEB, both the contemporary board activity as well as historical referrals to any MEB. Forms can also be downloaded from the MEDBOLTT website

(2) Physical Evaluation Board Liaison Officer (PEBLO) Counseling

The Physical Evaluation Board Liaison Officers (PEBLOs) provide a critical, congressionally mandated function of vital importance in the operation of the MTF MEB role. The PEBLOs are guided by SECNAVINST 1850.4 series in their role of counseling Navy and Marine Corps members who have been entered into the DON Disability Evaluation Manual. Upon receipt of findings do PEBLOs counsel patients receiving Findings of unfit for continued naval service on options for "home awaiting orders"

status

and as well as options for pursuing Permanent Limited Duty status. All PLD actions accordingly are regulated by service headquarters, and patients receiving PEB findings of unfit for continued naval service who wish to pursue PLD must submit this request pursuant to receiving their PEB findings. Additional information on this topic is available from the PEBLOs and in SECNAVINST 1850.4 series.

(3) Disposition: PEB directs service headquarters to effect a member's status within the naval Service. Disposition may mean one or a combination of the following:

Disposition

Fit to continue naval service

Unfit to continue naval service

Physically Qualified for continued naval service in the Reserves

Not Physically Qualified for continued naval service in the Reserves

Directed Action

Return to duty

Discharge under other provisions of law

Remove from TDRL

Discharge with severance pay

Discharge without severance pay

Transfer to TDRL

Continue on TDRL

Transfer to Permanent Disability Retired List

Return to duty

Discharge from the

Non-Disability Retirement (more than

15 years service-10 U.S.C. 12731b)

Note: Per MARADMIN 488/05: If a Marine is found Fit for Duty at the completion of a period of LIMDU or Fit for Continued Naval Service by the PEB and still unable to meet the retention and performance standards, the Marine may be subject to administrative separation at the discretion of the Commanding Officer.

**4. SPECIAL DUTY EXAMINATIONS:**

- a. Certain groups of personnel in the Navy and Marine Corps, by reason of the particular type of duty to which they will be assigned, are required to meet physical standards which differ from regular enlistment, commissioning, and annual Physical Health Assessments (PHA).

(1) Aviation Duty

Aviation physical standards are developed to assure that only the most qualified personnel are accepted into naval aviation. All personnel engaged in duties involving flying (including those assigned duty involving flying denied (DIFDEN)) and all candidates for such duty, must conform to the physical standards.

(a) Interval Annual Aeromedical Evaluation. Evaluated annually within 30 days of their birthday and certified physically qualified for continued aviation duties by the issuance of a NAVMED 6410/2.

**Aeromedical Grounding Notice (NAVMED 6410/1)**

**Aeromedical Clearance Notice (NAVMED 6410/2)**

(b) All aviation personnel admitted to the sicklist, hospitalized, and determined to be physically unable to perform flight duties will be issued a Aeromedical Grounding Notice, and an entry will be made in the members **Health Record on the Special Duty Medical Abstract (NAVMED 6150/2)**. This grounding notice will remain in effect until the member has been examined by a flight surgeon and found physically qualified. At such time, an Aeromedical Clearance Notice will be issued recommending returning the member to flight status and a corresponding Health Record entry made on the NAVMED 6150/2.

(2) Diving Duty

All personnel, except patients, exposed to the hyperbaric environment, including but not limited to those engaged in hyperbaric chamber duty (clinical, research, and recompression), hyperbaric coffers or caissons, sonar dome work (when in a hyperbaric environment), hull containment testing (compartment workers), diving, combat swimming (SEALs), USMC combat swimmers, and all candidates for such duty, must conform to the appropriate physical standards. When possible the diving medical examination (DME) should be performed by a medical officer, preferable a privileged undersea medical officer (UMO).

(a) Periodicity: All active divers will have a diving medical examination every 5 years. If assigned remote from a DMO or UMO, the examination will be conducted every 3 years. After age 45 the examination will be conducted every 2 years

(3) Occupational Exposure to Ionizing Radiation

NAVMED P 5055, Radiation Health Protection Manual, is the governing document for the naval service Radiation Health Protection Program. NAVMED P 5055 provides ionizing radiation exposure limits, dosimetry requirements, medical examination requirements, administrative and repeating requirements, and command duties and responsibilities for the Radiation Health Protection Program.

(a) Command Responsibility. The Commanding Officer or Officer in Charge of each naval facility will ensure that personnel have a radiation medical examination prior to being occupationally exposed to ionizing radiation.

(b) Types of Ionizing Radiation Medical Examinations

1. Pre-placement Examination (PE). Personnel who are being considered for routine assignment to duties requiring occupational exposure to ionizing radiation will be given a radiation medical examination, defined as a pre-placement examination, prior to assignment a transfer to those duties.

2. Re-examination (RE). Personnel who are to be continued in routine duties requiring occupational exposure to ionizing radiation must have a radiation medical examination, defined as a re-examination. The re-examination is required to be performed every 5 years within 30 days of the member's birthday following the year of initial employment. (month and year)

3. Situational Examination (SE). Any individual who has exceeded the radiation protection standards for occupational exposure per chapter 4 of NAVMED P 5055.

4. Termination Examination (TE). Reasonable efforts will be made to ensure that a worker receives a termination examination. If a termination examination is not completed or not performed (e.g., due to lack of employee cooperation, etc.), a SF 88 will be completed to the maximum extent practicable. The reasons why the form is incomplete will be recorded in block 73 of the SF 88. Personnel will be given a radiation medical examination, defined as a termination examination, if they satisfy one of the following conditions:

a. Upon separation or termination of their active duty or employment if they received a preplacement radiation medical examination, have documented occupational radiation exposure (including personnel monitored for exposure but who received 00.000 rem), and have not had a TE.

b. When permanently removed from the radiation health program.

c. When assigned or transferred to duties no longer involving occupational exposure.

(4) Explosive Handler and Hazardous Material Vehicle Operators

Medical examinations of explosive handlers and Hazardous Material Vehicle Operators are conducted to ensure active duty personnel who handle explosives or operate vehicles or machinery which transport explosive or other hazardous material are physically qualified. Members who are qualified under this section meet the physical qualification requirements of the Federal Highway Administration, DOT, CFR Part 391.

(a) Periodicity: Active duty military personnel who are explosive handlers or hazardous material vehicle operators will have a medical examination every 5 years up to age 50, then annually.

Note: Complete requirements of specific Special Duty examinations can be found in NAVMED P-117, Manual of the Medical Department, Chapter 15.
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## 5. Marine corps inspection programs

a. Mission readiness of a command is at the forefront of a Commander's thoughts. The Marine Corps has designed an extensive program to prepare and inspect the readiness of each command. The fundamental purpose of an inspection is to assess, assist and enhance the ability of a command to prepare for and to perform its assigned mission. The command's mission shall be the focus of the inspection. The IGMC will ensure through an inspection that commands are complying with Marine Corps orders, policies, and procedures, and accomplishing its assigned mission, tasks, and functions.

### (1) Command Inspection Program (CIP)

The purpose of the CIP is to assess the overall effectiveness of the Commanding General's Inspection Program (CGIP). The CIP by the Inspector General of the Marine Corps (IGMC) will be conducted, at a minimum, on a triennial basis. Efforts will be made to inspect on a biennial basis. These inspections will be short notice (approximately 48-72 hours prior notification).

### (2) Unit Inspection Program (UIP)

The purpose of the UIP is to inspect those independent units/activities of the Marine Corps that are not in the operational or administrative chain of command of a major subordinate commander (MSC).

### (3) Inspection Checklists

The Automated Inspection Reporting System (AIRS) contains the inspection checklists that are updated by the HQMC functional area sponsor and maintained by the IGMC. These checklists contain those areas, at a minimum, that should be inspected in any one functional area. Inspectors from the IGMC and command inspectors general (CIG) shall use AIRS inspection checklists when conducting inspections.

Report of findings, discrepancies and recommended corrective actions will be provided to the commander of the inspected unit and will form the basis for any required corrective action and/or refinement to successful programs. Inspectors will address findings and discrepancies by providing appropriate comments and suggestions to correct shortcomings.

Note: Image of the AIRS inspection checklist. Current AIRS checklist is available through the Marine Corps homepage and IGMC website.
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### (4) Follow-up Inspection

An inspection of the action taken by a unit to correct deficiencies identified during a Previous inspection. The purpose is to assess whether corrective action is effectively completed, producing the desired results, not causing new problems, economical and efficient, and is practical and feasible.

## 6. EVALUATION/FITNESS REPORT

a. Types of Reports

(1) Regular reports are submitted periodically according to schedule and on other occasions specified in the EVAL Manual and must be continuous for all Naval service personnel on active duty or in drilling Reserve programs, except for enlisted initial entry training and other limited circumstances.

<b>Periodic Report</b>	<b>Promotion/ Frocking</b>
<b>Letter of Extension Report</b>	<b>Not Observed Report</b>
<b>Detachment of Individual Report</b>	<b>Detachment of Reporting Senior Report</b>

FITREP/EVAL ending dates are the last day of the month for officers and the 15th of the month for enlisted.)

	<b>OFFICERS (Active)</b>	<b>OFFICERS (TAR)</b>	<b>ENLISTED (All)</b>
<b>January</b>	<b>O3</b>	<b>O3</b>	
<b>February</b>	<b>O2</b>	<b>O2</b>	
<b>March</b>	<b>W5, W4,W3</b>	<b>W5, W4,W3</b>	<b>E5</b>
<b>April</b>	<b>O5</b>	<b>O5</b>	<b>E9</b>
<b>May</b>	<b>O1</b>	<b>O1</b>	
<b>June</b>			<b>E4</b>
<b>July</b>	<b>O6</b>	<b>O6</b>	<b>E3/2/1</b>
<b>August</b>			
<b>September</b>	<b>W2</b>	<b>W2</b>	<b>E8, E7</b>
<b>October</b>	<b>O4</b>	<b>O4</b>	
<b>November</b>			<b>E6</b>
<b>December</b>			

(2) Concurrent reports provide a record of significant performance in an additional duty (ADDU) or temporary additional duty (TEMADD) status. They are optional unless directed by higher authority, and may not be submitted by anyone in the regular Reporting Senior’s direct chain of command.

(3) Operational Commander Reports are optional, and may only be submitted on Commanding Officers or Officers in Charge by Operational Commanders who are not also their regular Reporting Seniors.

b. Guide for Completing Reports

(1) Reporting Seniors and Raters – Commanding Officers may submit properly authorized FITREPs and EVALs on any individual, regardless of rank, who has reported

to that Commanding Officer for permanent, temporary, or additional duty under competent written orders. Officers in Charge and persons with equivalent titles are Reporting Seniors in their own right only if in charge of commissioned units or established activities. E7 through E9 and Federal civilian employees in command positions who hold the grade of GS-9 through GS-12 may sign reports on E5 and below. GS-13 or equivalent may sign reports for E5 to E9.

Evals on enlisted personnel E6 and below require the signatures of a rater, senior rater and reporting senior. This ensures Navy's senior enlisted and junior officer supervisors are properly included in the enlisted evaluation process. The rater should be an E-7 or civilian equivalent for E5-E6 personnel whenever possible. The rater for E4 and below can be an E6. The senior rater may be omitted where the reporting senior is the rater's immediate supervisor. Typically, the senior rater is the division officer or department head. Raters do not sign FITREPs for E7-O6.

(2) Basic Dos and Don'ts – Do not use underlining, **boldface**, *italics*, centering or highlighting. Handwritten comments or additions to comments are not allowed except reports on E-4 and below that may be entirely or partially handwritten. Continuation sheets and enclosures are not allowed, except an endorsed statement submitted by the member, a flag endorsement where required, a letter of extension of a Concurrent/Regular report or a classified letter supplement. Do not include classified matter in the report and do not submit classified supplements unless absolutely necessary. Include required comments and address special interest items as appropriate.

(3) Style and Content- Avoid preambles and get directly to performance. Do not use puffed-up adjectives. Use direct, factual writing which allows the performance to speak for itself. Bullet style is preferred. Give examples of performance and results (cause and effect). Don't rank numerically. Comparisons must be in general terms and supported by evidence. Be consistent with the trait marks. Comments on poor performance or misconduct where necessary, but be judicious. Define acronyms. Avoid making recommendations.

(4) Electronic Forms Software- COMNAVPERSCOM (PERS-311) supplies application programs to support automated preparation and submission of FITREPs and EVALs. These application (**NAVFIT 98a**) print complete, filled in reports and summary letter. The software provides help screens, spell check, calculates the individual trait average (for EVAL only), and has a validation features that will prevent many common errors. This will also produce the summary letter. The program is available for downloading at [www.npc.navy.mil](http://www.npc.navy.mil).

#### **NAVPERS 1616/26 Evaluation Report and Counseling Record (E1-E6)**

#### **NAVPERS 1610/02 Fitness Report and Counseling Report (E7-O6)**

#### c. Processing and Mailing reports

(1) COMNAVPERSCOM copy is the official record copy for E5 to O6. Although original reports and signatures are preferred, photocopied signatures are acceptable.

When laser-printing or copying the report, it is preferred that the back of the form be printed or copied head-to-toe on the reverse of the front. The number of required paper copies is as follows:

Grade of Member	Number of Copies	COMNAVPERSCOM	Field Service Record	Member	Reporting Senior	Command
O1-O6 W2-W5	3	X		X	X	
E7-E9	5	X	X	X	X	X
E5-E6	4	X	X	X		X
E1-E4	3(4)*	X	X	X		X

(2) Mail report within 15 days of the ending date for active duty members and within 30 days for inactive duty members. The package shall include the signed summary letter and all original reports. Mail the reports and summary letters together in a standard 9x12 envelope. Do not use security wrappings unless a classified supplement is enclosed. More than one summary group may be enclosed in each envelope. Mail reports to:

COMMANDER  
 NAVY PERSONNEL COMMAND PERS-311  
 5720 INTEGRITY DRIVE  
 MILLINGTON TN 38055-3110

(3) Classified supplements must have all required security markings. Do not classify the report form. Mail the report and classified supplement with its summary group, regardless of whether classified supplements are submitted with the other reports in the group. Mail reports to:

COMMANDER  
 NAVY PERSONNEL COMMAND  
 PERS 334 SECURITY MANAGER  
 5720 INTEGRITY DRIVE  
 MILLINGTON TN 38055-3340

## 7. NAVY AND MARINE CORPS AWARDS

a. Awards are important symbols of public recognition for rewarding extraordinary heroism, exceptionally meritorious service, or outstanding achievement and other acts or services which are above and beyond that normally expected and which distinguish an individual or unit among those performing similar acts or services. Awards recognizing specific acts should be bestowed as soon as possible after achievement. As a naval officer you are a respected leader and role model. As such, it is extremely important for you to recognize the

people who work for you, civilian and military alike. One of the basic tenets of leadership is that a good leader takes care of his or her people.

For military personnel, an award can range from a simple, positive comment about a junior's performance to writing the person up for a medal. More commonly, enlisted people are nominated for Sailor of the Quarter honors. Criteria are locally developed and you should consult the local instruction for nomination procedures. Enlisted awards such as flag officer letters of commendation and medals add to the Sailor's final multiple for advancement. Most commands have a local awards system that covers granting awards such as Letters of Recognition, Letters of Appreciation, and Letters of Commendation. These are generally easy to accomplish for deserving personnel and can be used for either military or civilian personnel.

As a general rule, only one award will be made for the same act, achievement, or period of meritorious service. It is inappropriate to duplicate awards, however, an award for heroism or specific achievement within the period of meritorious service is not considered duplication. Neither the summary of action nor the citation issued for the meritorious service should mention the heroic service or the specific achievement previously recognized.

b. Three types of awards

(1) Personal awards are for individual heroic or meritorious acts.

(a) A routine end of tour (EOT) award is not an integral part of the awards system. A copy of all personal awards received during the tour period must be submitted with the EOT award to the awarding authority.

(b) An impact award is for a short duration (up to 3 months) and specific achievement; this award cannot support an EOT award and a copy of it must be enclosed with the EOT award.

(c) Sailor of the Year, and similar awards, denote a specific competitive achievement; this award can support an EOT award and a copy of it must be enclosed with the EOT award. Only one award of this nature can be earned in any given year.

(d) Mid-tour awards are not appropriate; commands should retain the nomination or inclusion in the EOT award. A tour is normally designated by a set of orders to leave the command, not by a change of position within the command. This should not hinder a command from awarding an EOT award and/or an additional award for members who extend at arduous duty stations or operational commands.

(2) Unit awards are awarded to ships, squadrons, commands, or units for heroic or meritorious acts.

(3) Service awards recognize individuals for duty in areas of particular concern, like the Vietnam Service Medal or the Navy and Marine Corps Overseas Service Ribbon.

c. Forms for submitting awards:

**OPNAV 1650/3, Personal award recommendation**

**OPNAV 1650/14, Unit award recommendation**

d. Maintenance of Records

CNO/CMC Awards Branches maintain the master list of personal military decorations awarded by all Navy and Marine Corps awarding authorities.

(1) For Navy personnel

(a) Pertinent information from the submitted and properly completed OPNAV 1650/3 is entered into the Awards Information Management System (AIMS) data base and transferred on a weekly basis into the BUPERS Master Awards File. Bureau of Personnel (BUPERS) (PERS 32) makes extractions from this file to complete the awards information section on Enlisted and Officer Service Records (ESRs/OSRs). Only personal awards, Navy and Marine Corps Achievement Medal and above, are recorded into the AIMS System. Fleet Commanders-in-Chiefs and Type Commanders are authorized to perform direct entry of approved awards into the AIMS system. Unit, campaign and service awards are entered into AIMS by unit, not by individual service members, consequently these awards are not documented on the ESR/OSR. The personal awards package is then forwarded to BUPERS (PERS 313C) for citation microfilming into individual permanent service records.

(b) All awarding authorities are responsible for forwarding the original OPNAV 1650/3, completed and signed, on a periodic basis after presentation of awards. The award copy is sent to the AIMS authority in the chain of command: Type Commander, Fleet Commander in Chief, or CNO (N09B13). Staple a signed copy of the citation, with the member's social security number (SSN) typed in the upper right hand corner to the OPNAV 1650/3. CNO (N09B13) does not require cover letters, delivering endorsements, the summary of action, certificates, or advance copies.

(c) Each delegated awarding authority will maintain records of awards processed to include the OPNAV 1650/3, a signed copy of the citation, supporting documents and related correspondence in accordance with the Navy and Marine Corps Records Disposition Manual (SECNAVINST 5212.5 Series).

(2) For Marine Corps

(a) AIMS was replaced by the use of the Headquarters Marine Corps Electronics Awards System. Use of the electronic awards system fulfills all recordkeeping requirements. Paper documentation of approved awards is not required.

## **REFERENCES**

MANMED P-117, Chapter 15

MANMED P-117, Chapter 18

NAVMC DIRECTIVE 5040.6H

BUPERSINST 1610.10A

SECNAVINST 1650.1G

**UNITED STATES MARINE CORPS**  
**FIELD MEDICAL TRAINING BATTALION**  
**TRAINING COMMAND**  
**BOX 21010**  
**CAMP PENDLETON, CA 92055-1010**

**INDIVIDUAL PREPAREDNESS FOR IMPROVISED EXPLOSIVE DEVICE (IED)**  
**DEFEAT**

**TERMINAL LEARNING OBJECTIVES.**

- (1) Given an operational environment with an Improvised Explosive Device (IED) threat, visually identify IEDs per the references. (XXXX.01.01)
- (2) Given an operational environment, react to an Improvised Explosive Device (IED) by conducting immediate actions per the references. (XXXX.01.02)

**ENABLING LEARNING OBJECTIVES.**

- (1) Without the aid of references, describe the components of an Improvised Explosive Device (IED) per the references. (XXXX.01.01a)
- (2) Without the aid of references, identify IED initiation methods per the references. (XXXX.01.01b)
- (3) Without the aid of references, given a scenario involving a known IED threat, visually identify indicators of ground emplaced IEDs per the references. (XXXX.01.01c)
- (4) Without the aid of references, identify the characteristics of vehicles used in Vehicle Borne IED (VBIED) and Suicide Vehicle Borne IED (SVBIED) attacks per the references. (XXXX.01.01d)
- (5) Without the aid of references, describe the physical characteristics of a SVBIED driver per the references. (XXXX.01.01e)
- (6) Without the aid of references, describe the common characteristics of a potential Suicide Bomber attack per the references. (XXXX.01.01f)
- (7) Without the aid of references, identify common employment techniques of IEDs per the references. (XXXX.01.01g)
- (8) Without the aid of references, describe mitigating tactics that can be employed in an IED

environment per the references. (XXXX.01.02a)

(9) Without the aid of references, identify non-lethal deterrents that can be employed in an IED environment per the references. (XXXX.01.02b)

(10) Without the aid of references, state the procedures for conducting 5 to 25 meter checks per the references. (XXXX.01.02c)

(11) Without the aid of references, given a list of the 5 C's and their definitions, match each step to the correct definition per the references. (XXXX.01.02d)

(12) Given an operational environment containing IEDs, react to an IED detonation per the references. (XXXX.01.02e)

1. **THREAT REVIEW.**

a. What is an IED? IEDs are a dangerous and effective weapon system that military forces face. IEDs can be made from almost anything with any type of material and initiator. They are an improvised device that are designed to cause death or injury by using explosives alone or in combination with other materials, to include projectiles, toxic chemicals, biological toxins, or radiological material. IEDs can be produced in varying sizes and can have different types of containers, functioning, and delivery methods. IEDs can use commercial or military explosives, homemade explosives, or military ordnance and ordnance components. IEDs are primarily conventional high-explosive charges, also known as homemade bombs. A chemical and biological (CB) agent, or even radiological material, may be included to add to the destructive power and the psychological effect of the device. They are unique in nature because the IED builder has had to improvise with the materials at hand. Designed to

b. **Definitions.**

(1) **Improvised Explosive Device.** (DOD) A device placed or fabricated in an **improvised manner** incorporating destructive, lethal, noxious, pyrotechnic, or incendiary chemicals and designed to destroy, incapacitate, harass, or distract. It may incorporate military stores, but is normally devised from nonmilitary components. Also called IED. (JP 1-02)

(2) **Booby Trap.** (DOD) An explosive or non-explosive device or other material, deliberately placed to cause casualties when an **apparently harmless object is disturbed or a normally safe act is performed** (JP 1-02).

(3) **Mine.** In land mine warfare, an explosive or material, normally encased, designed to destroy or damage ground vehicles, boats, or aircraft, or designed to wound, kill, or otherwise incapacitate personnel. It may be detonated by the action of its victim, by the passage of time, or by controlled means. (JP 1-02)

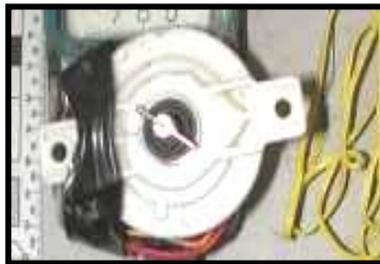
c. **Components of an IED.** IEDs can vary widely in shape and form. IEDs share a common set of components that consists of the main charge, initiating system, and casing.

(1) Casings can range in size from a cigarette pack to a large truck or airplane. The container is used to help hide the IED and to possibly provide fragmentation. A myriad of containers have been used as casings, including soda cans, animal carcasses, plastic bags, and vests or satchels for suicide bombers.



(2) Initiating System. The initiating system causes the main charge to function. It can be a simple hard wire (for command detonation) or a radio frequency (RF) device such as a cellular telephone or toy car remote control (for radio controlled IEDs). The initiator almost always includes a blasting cap and batteries as a power source for the detonator. Any type of battery may be used, such as: 9-volts, AA, and vehicle batteries. IEDs may even be wired into the local power supply of a home or office. Initiating systems are triggered in three different ways.

- (a) Time. Time IEDs are designed to function after a preset delay, allowing the enemy to make his escape or to target military forces which have created a pattern. Timers used include igniferous (fire producing), chemical, mechanical, and electronic devices.



(b) Command. Command-initiated IEDs are a common method of employment and allow the enemy to choose the optimal moment of initiation. They are normally used against targets that are in transit or where a routine pattern has been established. The most common types of command-initiated methods are with command wires or radio-controlled devices, such as LRCTs, cordless telephones, and remote car openers and alarms.



(c) Victim. A victim-actuated IED is a means of attacking an individual or group of individuals. There are various types of initiation devices, which include pull or trip, pressure, pressure release, movement-sensitive, light-sensitive, proximity, and electronic switches. Trip wires have also been used and targeted for foot mobile patrols or for turret gunners in convoys.



Hose switch pressure activated

(3) Main Charge.

a. High Explosive: The most common main charge encountered is high explosive. Common explosives used are military munitions, usually 122-millimeter or greater. These items are the easiest to use and provide a ready-made fragmentation effect and they allow for relatively easy “daisy chaining,” which is linking multiple main charges together over long or short distances for simultaneous detonation. Other IEDs have used military and commercial explosives, such as PE4, trinitrotoluene (TNT), ammonium nitrate (fertilizer), and fuel oil (ANFO). Common hardware, such as ball bearings, bolts, nuts, or nails, can be used to enhance the fragmentation. Propane tanks, fuel cans, and battery acid can and have been added to IEDs to propagate the blast and thermal effects of the IED.

b. Chemical: Any toxic chemical fabricated to kill or incapacitate coalition forces. This would be an IED with a chemical payload instead of an explosive payload. The effects to the victims would be due to the chemical involved rather than the explosive effect; i.e. incapacitating, choking, nerve, blood, biological. A chemical attack is characterized by less explosive yield, possible visible smoke, smells that are inconsistent with surroundings and common symptoms that are consistent with the different types of chemical agents that may be employed. Some indicators for chemical IEDs are: smaller blasts, odor, gas cloud and liquid on or near the suspected IED.

c. **Detect.** There are numerous means of detection that can assist in locating IEDs, however the best means of detection is your situational awareness. Below are some examples of indicators, locations and considerations of IEDs:

(1) Primary Indicators. The primary indication of an IED will be a change in the baseline (something new on the route that was not there yesterday). The enemy may leave behind visual indicators of an emplaced IED by accident or on purpose (to inform the local population). Vigilant observation for these subtle indicators can increase the likelihood of IED detection by friendly forces before detonation. Examples of possible roadside IED indicators include, but are not limited to:

(a) Variations in baseline that seem out of place, such as freshly disturbed dirt, concrete that does not match the surrounding area.

(b) Vehicles following a convoy for a long distance and then pulling to the roadside.

(c) Personnel on overpasses.

(d) Signals from vehicles or bystanders (flashing headlights).

(e) People videotaping ordinary activities or military actions. Enemies using IEDs often document their activities for use as recruitment or training tools.

(f) Suspicious objects.

(g) Metallic objects, such as soda cans and cylinders.

(h) Unusual behavior patterns or changes in community patterns, such as noticeably fewer people or vehicles in a normally busy area, open windows, or the absence of women or children.

(i) Markers by the side of the road, such as tires, rock piles, ribbon, or tape that may identify an IED location to the local population or serve as an aiming reference for the enemy triggering the IED (such as light poles, fronts or ends of guardrails, and road intersections).

(j) New or out of place objects in an environment, such as dirt piles, construction, dead animals, or trash.

(k) Graffiti symbols or writing on buildings.

(l) Signs that are newly erected or seem out of place.

(m) Obstacles in the roadway to channel convoys.

(n) Exposed antennas, detonating cord, wires, or ordnance.

(o) Wires laid out in plain site; these may be part of an IED or designed to draw friendly force attention before detonation of the real IED.

(2) Locations of IEDs. IEDs may be emplaced anywhere that enough space exists or can be created to hide or disguise the IED. Whenever possible, devices are located where employment can exploit known U.S. patterns (such as the use of a main supply route [MSR]) or vulnerabilities (such as soft-skinned vehicles or chokepoints). Common areas of IED emplacement include, but are not limited to:

(a) Previous IED sites (past successes, laziness, exploiting Techniques, Tactics, and Procedures [TTPs]).

(b) Frequently traveled, predictable routes, such as roads leading to firm bases and along common patrol routes.

(c) Boundary turnaround points (pattern).

(d) Medians, by the roadside (usually within 10 feet), or buried under the surface of any type of road, often in potholes and covered with dirt or reheated asphalt.

(e) Trees, light posts, signs, overpasses, and bridge spans that are elevated.

(f) Unattended vehicles, carts, or motorcycles (attached or installed in them).

(g) Guardrails (hidden inside) or under any type of material or packaging.

(h) Potential incident control points (ICPs).

(i) Abandoned buildings or structures (sometimes partially demolished).

(j) Cinder blocks (hidden behind) or piles of sand to direct blast into the kill zone.

(k) Animal carcasses and deceased human bodies.

(l) Fake bodies or scarecrows in coalition uniforms.

(m) At the edge of town.

(3) Vehicle Borne IED/Suicide VBIED. VBIED/SVBIEDs are so successful because the enemy is mobile and can choose the time and place with much greater flexibility. This unpredictability makes them difficult to identify.

(a) **Driver Indicators**

1 A lone male driver. This is the historical standard for VBIED operations; however, there could be any number of people in the vehicle if an unsuspecting person is driving the VBIED. Some VBIEDs have two to three people and females are sometimes used as a distraction.

2 Ignoring orders to stop, attempting to circumvent a security checkpoint, or attempting to maneuver too close to coalition assets

3 Unusual appearance. The enemy may be uncharacteristically clean-shaven and have very short haircuts. Cutting the hair is a part of the purifying ritual that many follow prior to an attack.

4 Age in mid-twenties. The average Middle Eastern suicide terrorist is about 24-25, but this may vary in your unique situation.

5 Driving erratically; driving too slow or too fast.

6 Wearing inappropriate dress for the environment.

#### (b) **Vehicle Indicators**

1 Noticeable sagging of the vehicle.  
2 An additional antenna for radio-controlled devices.  
3 Darkened or covered windows to conceal either vehicle's contents or actions of the driver.

4 Recent painting of vehicle to cover body alterations.

5 Crudely covered holes made in the vehicle to hide explosives.

6 New welding marks.

7 No license plates.

8 Escorted by unusual security detail for type vehicle.

9 New tires on an old vehicle.

10 Anything unusual in factory-built compartments.

11 New or shiny bolts and/or screws.

12 Unusual scratches, possibly made by screwdrivers, wrenches, or similar tools.

13 Signs of tampering, such as broken parts or bent sheet metal.

14 Areas and components cleaner or dirtier than surrounding areas.

15 Wire and tape stored in vehicle.

#### (c) **Situation Indicators**

1 Camera crew in the area.

2 Observing the same vehicle more than once.

3 Absence of normal routine for that AO.

4 Odd traffic patterns.

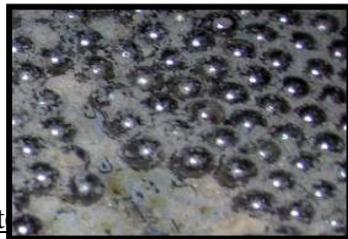
5 Person(s) observed conducting reconnaissance.

6 Vehicle testing local defenses (i.e. drives at a high speed towards traffic control point and then breaks off).

(4) **Suicide Bombers(Personal Borne IED-PBIED)**. Most suicide attacks involve SVBIEDs, and include casualty rates from tens to hundreds. Recently, however, there has been

an increasing trend for suicide bombers to attack with an explosive vest, belt or baggage. Coalition Forces have been attacked within the perimeter of a Firm Base; civilians have been attacked at polling stations and at police recruitment drives; a civilian contractor was killed when a bomber exited his vehicle in traffic, approached the contractor's vehicle, and detonated his vest/belt. With effective techniques being used to reduce the effectiveness of VBIEDs, the potential for the enemy to adapt to using suicide bombers increases.

a. PBIED design. If the charges used by bombers are effectively packaged and concealed, a suicide bomber could carry up to 45 pounds of explosives; however, most suicide belts are designed to hold smaller amounts, up to 12 pounds. The mass of this weight of explosive promotes conformity of the belt to the individual, improving concealment. It should be noted that fragment producing materials are often incorporated into the design of these belts/vests.



b. Indicators of a Pot

1 An individual who deliberately ignores orders to stop or attempts to circumvent a security checkpoint.

2 An individual wearing too much clothing for the prevailing weather conditions.

3 A person with suspicious bulges in his/her clothing, carrying packages/bags or wearing satchels/backpacks.

4 An individual handling wires, switches, an actuator, or a “dead man’s” switch.

d. **Employment Techniques.** Below are some ways that IEDs can be used, whether they are emplaced by enemy or used as VBIEDs. Additionally, there are some TTPs included that the enemy has used in order to hinder the mobility efforts of coalition forces. Keep in mind that enemy TTPs constantly change and adapt to try and stay ahead of coalition TTPs. The enemy has also incorporated the use of small arms fire in conjunction with the IED attack to harass and forces and increase the lethality of attacks.

(1) IEDs have been used in the following ways:

(a) Disguised IEDs concealed with just about anything (trash, boxes, tires,) and placed in, on, above, or under where potential targets appear. Multiple IEDs have also been daisy chained (several charges linked together with det cord or electrical wire so that all charges detonate simultaneously) to achieve simultaneous explosions.

(b) Thrown or projected IEDs (improvised grenades or mortars). One enemy TTP targets convoys as they drive under an overpass; two enemy on top of the bridge (spotter & dropper) will attempt to drop IEDs in the back of vehicles as they pass under. Convoys must be aware of the 360-degree threat while traveling. Changing speeds and dispersion will help mitigate the threat to some extent.

(c) IEDs hidden in, on, or under a secured/unsecured object. Often times coalition forces may want/need to clear the roads of abandoned or broken down vehicles or debris from the side of the road that could pose a threat to convoys that travel along a given route. Identifying possible enemy fighting or firing positions is paramount in order to keep all friendly forces safe while removing hauling or pushing the debris out of the way. If a remote investigative capability is available, use it to ensure that the debris being moved is not rigged with explosives.

(d) Hoax IEDs include something resembling an actual IED, but have no charge or a fully functioning initiator device. One TTP that has been used before is where the enemy has emplaced a fake IED along a given route that could be seen by the lead vehicle in a convoy causing the convoy to come to a stop. Once the convoy has identified the potential threat and stopped prior to what is believed to be the IED, it is discovered that the enemy has emplaced an IED along the route either before or after the believed threat putting the convoy in the actual attack zone. The use of the hoax IED is used to learn coalition procedures, monitor time, delay or harass activities in support of the mission.

(2) More less specific techniques include:

(a) The Basic IED Attack. The enemy will place IEDs along routes on either side of the road awaiting foot patrols or convoys to approach in order to cause the most damage to

personnel or vehicles. When the convoy reaches the attack or kill zone, the enemy initiates the IED in order to cause the most damage. It is imperative that coalition forces be vigilant and alert at all times to identify the many different locations an enemy may possibly hide in order to trigger an IED or signal a trigger person.

(b) The “Broken Down” Vehicle Attack. The attack uses a simulated broken down vehicle placed on the side of the road to cause convoys to change their intended route. The broken down vehicle is staged in the road, either side, blocking one or all of the trafficable lanes causing the convoy to be canalized between the broken down vehicle and an emplaced IED. If the convoy chooses to pass, that is possibly when the IED is detonated. It has also been noted that Coalition Forces have stopped prior to the broken down vehicle and found to have stopped in the kill zone along the side of a daisy chained IED on their flanks.

(c) Coordinated Attack. Numerous enemies work to emplace an IED along a route, usually in an urban area. Once the IED is emplaced and initiation method has been emplaced, one enemy will stand by out of site of the convoy or patrol and wait to give the signal to another enemy to detonate. The enemy is usually located where they have the best escape route to not be seen or caught. Once the convoy is next to the IED or well within the kill zone, the enemy with good visualization will signal the other to initiate the IED. Once the IED has detonated, the enemy breaks contact and blend in with the population making it harder to be identified or caught.

(d) Ramming Convoys. The enemy has been known to ram their vehicle (possibly an SVBIED) in the rear of a convoy or to the side as they pass in order to get the convoy to slow or come to a complete stop. As the convoy stops, an IED already placed on the side of the road or the SVBIED is detonated causing damage to personnel and equipment. As well, the enemy has been known to get in front of a convoy slowing their rate of March in order to conduct a coordinated attack with another VBIED.

(e) Motorcycles. Used by the enemy in areas of decreased mobility in order to harass convoys and possibly throw IEDs or grenades in the rear of vehicles. Once the IED or grenade was launched at the intended vehicle, the motorist would escape using a pre-designated route that was severely restricted to trucks of larger size. Ensure personnel are constantly watching the rear and flanks of the convoy to keep this threat to a minimum.

**2. OPERATIONS IN AN IED ENVIRONMENT**. In order to mitigate the effects of an IED, there are several things Marines can do regardless of the type of threat. Wear all personnel protective gear available, to include ballistic eye protection, Kevlar helmets, body armor with plates, and hearing protection are the most basic. Other simple but critical force protective measures include wearing seatbelts when moving and ensuring that all personal have as much of their body inside the vehicle as possible to reduce the possibility of being struck by shrapnel or being exposed to the initial blast.

a. **Pre-movement Rehearsals.** Operating units must be prepared to react quickly and efficiently to any attack--especially IED attacks. It is vitally important to maintain a combat hunter mindset and make all attempts to make yourself a hard target. One enemy TTP is to set hoax IEDs in order to observe our reaction so they can position the real IEDs in a position to increase the lethality of their attack. Study updated maps carefully, a significant number of IEDs are set up in the exact same location of previous attacks. Some guidance steps on how to react to IED attacks have been listed but, it is not meant to replace initiative and ingenuity of the small unit leader. Remember that the IED attack may be just one part a complex attack. The unit must be prepared to react to any threat after the IED detonates and move out of the kill zone as quickly as possible.

b. **Patrolling.** One of the most important things you can do to protect yourself and your unit is to limit your predictability. Consider varying routes, movement techniques, and your TTP's for dealing with different situations. Remember, the enemy is always watching. For example, if you react to a specific situation such as a disabled vehicle or suspected IED the same way every time, the enemy will quickly catch on and will use this knowledge to his advantage. Using the combat hunter mindset, patrols should change direction and speed at seemingly random intervals (especially in areas of previous IED attacks). Additionally, these techniques will present the patrol with a different and often more advantageous observation angle that may reveal the "backside" of an IED that was poorly camouflaged.

(1) **Counter VBIED/SVBIED Techniques.** Remember that there is a difference between a VBIED and an SVBIED. The VBIED is a parked vehicle in a high traffic area with the intent of causing the most damage. An SVBIED is when the driver goes out with the intent of making contact with a coalition patrol and driving into their midst, then the command detonating his explosives. The key to surviving a VBIED/SVBIED attack is standoff and cover. Stress to security personnel that a SVBIED can come from any direction. Units have been attacked by vehicles turning into a patrol from oncoming traffic, moving in a convoy, or in firm base attacks. Make sure you do not present a lucrative target for a VBIED/SVBIED. Maintain an aggressive security posture and have a plan for dealing with civilian traffic. This can include, but is not limited to, the use of signs in the local language, formations that take up all lanes in the road, visual signals, use of an air horn, and the use of flares to warn cars to stay back. Below is a list of some things to think about:

- Top gunners and security personnel should be alert and constantly aware of any vehicle approaching their patrol or parked along the route.
- Within the ROE, any suspicious vehicle should not be allowed to approach coalition forces. Employ warning signs to tell civilian drivers to remain clear of a moving convoy.
- Convoy and patrol members should know the authorized escalation of force procedures.
- Be aware of danger areas/choke points such as turnoffs that force the patrol to slow down.
- Watch merging traffic as VBIEDs have used on or off ramps to get near coalition vehicles.
- If you are going to allow civilian traffic to pass your convoy, make sure you have developed a technique to visually check cars and drivers as they approach.
- If you are not going to allow civilian traffic to pass your convoy, make sure that you have a plan to let civilians know to stay back, and have a plan for the escalation of force.

(a) Maintaining Standoff: Mobile. Escalation of force techniques/ROE: The techniques used should be simple, clean, and definite:

Non-lethal warnings

- 1 Aggressive/defensive vehicle maneuvers
- 2 Signs in the local language on the rear of vehicle (“Stay Back, Do Not Pass”)
- 3 Hand and arm signals
- 4 Air horn/siren/bull horn/whistle
- 5 Spotlight (nighttime)
- 6 Green lasers
- 7 Non-lethal warnings
- 8 Chem-lites, water bottles
- 9 Use of pen flares
- 10 Flashbangs

Application of deadly force

- 1 Warning shots.
- 2 Engage vehicle with weapon, if necessary (ROE).
- 3 Engage the driver/occupants, if necessary (ROE).

(b) Maintaining Standoff: Stationary

- 1 Recon site prior to occupation.
- 2 Perform 5 to 25 meter checks upon halt.
- 3 Maximize distance from roadway (mine and buried IEDs may present a threat)
- 4 Make use of natural barriers
- 5 Maintain good dispersion
- 6 Quickly establish overt perimeter:
  - ° Cones
  - ° Barbed wire
  - ° Signs
  - ° Road spikes
- 7 Establish overwatch of primary position
- 8 Defend in depth
- 9 Position electronic countermeasure (ECM) devices for maximum coverage
- 10 Keep roads clear of civilian vehicles

(2) Counter Suicide Bomber Techniques.

a. Evacuate the area immediately. Safe distances will depend on the mass of explosive carried by the bomber and the amount and type of fragmentation used.

b. “Close and negotiate” tactics **should not be attempted**, as suicide bombers are usually trained to avoid surrender at all costs.

c. A “fail safe” cell phone or radio-controlled initiator could be used in the event that the bomber is incapacitated or hesitates. This tactic would normally involve a second suspect with a line-of-sight view of the bomber and should always be considered.

d. If a “deadly force” response is taken, bullet impact may initiate/detonate the explosive charge(s). Firing on the suspect should only be undertaken from protective cover.

e. If the suspect is neutralized and there is no explosion, **do not administer first aid.** Wait for EOD to render safe the explosive charge.

(3) Actions at Halts. If a patrol or convoy must stop during movement, avoid clustering vehicles and vary the vehicle interval between elements; establish your own local security and employ techniques to create standoff. If you stop for any length of time, improve your position constantly and consider contingencies (hasty and deliberate defense) for the site you are occupying. Most importantly, do not remain at one site too long and conduct 5 to 25 meter checks as described below.

a. 5 to 25 Meter checks. Depending on the length of time at the halt, the area to clear varies from 5 to 25 meters. At every halt, no matter how short, the crew must visually clear 5 meters around the vehicle while remaining inside. For extended halts, teams must physically clear 25 meters around the patrol or convoy. Begin 5 to 25 before stopping to avoid stopping on top of an IED.

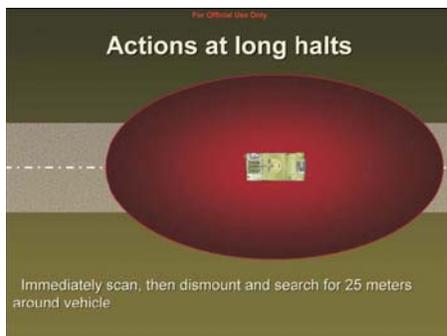
#### 1 5 meter checks:

- Identify a position to halt.
- Visually check the area 5 meters around your vehicles.
- Look for disturbed earth and suspicious objects, loose bricks in walls, and security ties on streetlights or anything out of the ordinary.
- Start your search at ground level and continue up above head height. Then conduct a physical check for a radius of 5 meters around your position. Be systematic, take your time, and show curiosity. If the tactical situation permits, use a white light or infrared (IR) light at night.
- If in an armored vehicle, remain mounted during your 5 meter check to take advantage of the vehicle’s protection.



## 2 25 meter checks:

- Add to the 5 meter check when the patrol or convoy leader decides to occupy an area for any length of time.
  - Begin 5 to 25 before stopping to avoid stopping on top of an IED.
- Once 5 meter checks are conducted, continue visually scanning out to 25 meters.
- Conduct a physical search for a radius of 25 meters around your position.
- Look for IED indicators and anything out of the ordinary.



(4) Actions on Contact. An improvised explosive device (IED) is a form of attack by the enemy. Any IED that detonates should be treated as an enemy contact. Contingency plans and rehearsals are key to concluding the contact, hopefully with the capture or death of the bomber. If you find an IED before it explodes, you must treat it like it will explode at any moment. The enemy at the firing point may be waiting for more Marines to gather around the device before setting it off. He may be moving from an observation point (OP) to the firing point. Training on basic tactics, techniques, and procedures (TTP) will enable you and your unit to win the engagement.

### (a) IED Found Before Detonation.

**The Five "Cs"**. The five "Cs" represent a simple set of guidelines that you should use when you encounter a suspected IED:

- Confirm
- Clear
- Call/check
- Cordon
- Control

**1 CONFIRM.** You should always assume the device will explode at any moment. From a safe distance look for IED indicators. Use any hard cover you have available while attempting to confirm the suspected IED, and never risk more personnel than the tactical situation requires. Use all tools at your disposal, to include moving to a better vantage point and using optics to look for tell-tale signs of an IED: detonating (det) cords, antennas, electrical wires, or exposed ordnance. Never ask civilians to remove an IED, you may solicit information regarding the suspected IED. Stay as far back as possible while looking for clues. When in doubt, back away.

**Note:** Do not attempt to do the job of explosive ordnance disposal (EOD) or engineers.

**2 CLEAR.** Evacuate the area to a safe distance (terrain will dictate) but do not set a pattern. Keep in mind some threats require more standoff than others. Assess whether your distance and cover is adequate and direct people out of the danger area. Sweep the area for any secondary device or trigger person. Once safe question, search, and detain as needed. **Do not** allow anyone to enter your cordon other than those responsible for rendering the IED safe(EOD).

**3 CALL/CHECK.** Let your higher headquarters know what you have found and submit an Explosive Hazard 9-line report. When you move to a new location, all personnel should conduct 5 to 25 meter checks for secondary IEDs. Always assume a found IED is a bait round and the real IED is near your “secure” location. Report additional IEDs to the on-scene commander.

LINE 1. Date-time group (DTG): When the item was discovered?

LINE 2. Report activity and location: Unit and grid location of the IED/UXO.

LINE 3. Contact method: Radio frequency, call sign, point of contact (POC), and telephone number.

LINE 4. Type of ordnance: Dropped, projected, placed, or thrown; give the number of items if more than one.

LINE 5. Nuclear, biological, chemical (NBC) contaminations: Be as specific as possible.

LINE 6. Resources threatened: Equipment, facilities, or other assets that are threatened.

LINE 7. Impact on mission: Short description of current tactical situation and how the device affects the status of the mission.

LINE 8. Protective measures: Any protective measures taken to protect personnel and equipment.

LINE 9. Recommended priority: Immediate, indirect, minor, no threat.

**4 CORDON.** Establish blocking positions to prevent vehicle and foot traffic from approaching the IED. Immediately search the safe area for secondary IEDs before occupying it. Make maximum use of available cover. Establish 360 degree inner and outer cordon to secure and dominate the area. Most likely, the enemy is watching and waiting to make his move. Randomly check people leaving the area to deter attacks. Establish obstacles to control approaches to security positions. The enemy may try to attack local security forces using a VBIED.

**5 CONTROL.** Control the site until EOD arrives. Clear and set up an entry control point (ECP) for first responders. Do not let others go forward to “inspect” the IED. Make contingency plans for coordinated attacks.

Should you be part of a patrol or convoy that finds an IED, the five "Cs" will help to ensure that the situation can be dealt with quickly and safely. Remember, an IED that is found is still an IED attack. By finding the IED, you have just disrupted the enemy's attack. Do not forget about the enemy's other forms of attack, RPGs, small arms fire, mortars, and secondary IED. Enemy IED site = Enemy ambush site. You are in the kill zone!

(b) Suspected IED — What Not To Do.

**1 Never approach a suspected IED.** Establish standoff by using binoculars and spotting scopes from multiple angles to confirm the presence of an IED. When in doubt, back off and call EOD.

**2 Do not pick up det cord.** Det cord is an **explosive** and the presence of it alone is enough to call EOD. Do not trace or pull on det cord.

**3 Do not directly Trace command wire (CW).** The enemy has placed trip wires and other IEDs under/in the vicinity of command wires. When a command wire is located, rather than walking parallel to the wire or over the wire to locate the initiation point, work in an “S” pattern, crossing the CW until the initiation point is located.

**4 Do not focus on the “found” IED.** An IED, once found, is not going to move. Conduct secondary sweeps (5 to 25) and set in cordons. Always think a couple steps ahead and have a plan for any possible encounters that may arise. Again, once positive IED indicators are found move to safe distances and call EOD.

(5) IED Detonation. Immediate actions differ when an IED is actually detonated. The enemy may often combine the IED attack with a direct fire ambush to increase the lethality of the attack. In deciding the best course of action following an IED detonation, the leader must consider the possibility of an ambush. The 5 "Cs" are still applicable; however, you must now incorporate your counter-ambush TTPs. Units should be proficient in actions on contact, and team members should be cross-trained on other patrol member's duties. Remember, an IED attack is an ambush. It is important to note that the results of an IED attack can range from catastrophic to no damage at all. If you are attacked, your reaction to contact drills will have to be modified based upon vehicle damage and casualties.

**Key points:**

- Quick, lethal and aggressive response in accordance with rules of engagement (ROE).
  - Immediately scan outward. The biggest mistake Marines can make is focusing inwards toward the site of the IED detonation and forgetting about the enemy.

Obviously, some Marines will have to assess the situation, communicate with higher, tend to wounded, and recover vehicles. Every other patrol or convoy member should scan around the location for the enemy.

- Move out of kill zone.
  
- Search for/Clear additional IEDs (5 to 25).
  - At the new location (5 to 25).
  - At the location where the vehicle is disabled(5 to 25).
- Treat/Evacuate casualties.
- Report situation.
- Expect follow on attacks.

(a) IED Detonation: No Ambush; with or without casualties. After an IED is detonated, the unit leader must be prepared to react immediately to a number of potential scenarios. The method chosen will depend on the mission and the circumstances following the attack:

- 1 If there is a casualty the unit leader may choose to conduct a CASEVAC
- 2 The unit leader may choose to continue movement.
- 3 Dismount vehicles and seek out the trigger man.
- 4 Search the surrounding area.
- 5 Conduct vehicle recovery operations.
- 6 Preserve forensic evidence.
- 7 Conduct 5 C's. Be prepared to take additional action as your situation develops.

Below is an example of a unit SOP-driven immediate action drill that uses the acronym REACTER:

- **Report.** Report contact to personnel internal to patrol/convoy; gain situational awareness.
- **Evacuate.** Able vehicles and personnel clear kill zone.
- **Area.** Secure the area (i.e.; establish snap blocking positions using contents of snap VCP kits, conduct 5 to 25 meter checks, establish 360 security, establish overwatch, establish cordon, scan/search for possible triggermen/cameramen). Focus on enemy and control area.
- **Clear the kill zone.** Conduct a sweep for secondary IEDs while clearing to damaged vehicle/kill zone. CREW assets should be integrated into sweep if available. First responders should move up immediately behind sweep, but should not move to kill zone before area is secure or sweep for secondary IEDs is conducted.

- **Treat casualties:** initial lifesaving procedures only. Do not establish Casualty Collection Point (CCP) in kill zone and do not linger in kill zone.
- **Establish CCP and LZ** away from kill zone i.e.; min 300 meters. Conduct 5 to 25 meter checks at CCP and LZ.
- **Report/recover.** Report situation to higher and Recover damaged vehicles as required.

(b) IED Detonation with Direct Fire Ambush. When no direct fire ambush is present, the priority is to determine if other IEDs exist in the immediate area. When a direct fire ambush is present, the priority shifts slightly; the threat of a direct fire ambush is outweighed by the actual ambush, so the enemy must be addressed first. The leader must employ the principles of reacting to near or far ambushes, and then conduct the 5 Cs

(c) IED Detonation with near ambush. In a near ambush, the kill zone is under very heavy, highly concentrated, close-range (with in hand grenade range) fires. There is little time or space for men to maneuver or seek cover. The longer they remain in the kill zone, the more certain their deaths. If attacked with a near ambush:

1 Men in the kill zone should immediately assault the enemy's position incorporating your unit's counter-ambush TTP's. The assault should be swift, violent, and destructive. Be prepared to continue fire and maneuver, or break contact, as directed.

2 Men not in the kill zone maneuver against the ambush force, firing in support of those assaulting.

3 If the ambush force is small enough to be routed or destroyed, the patrol members should continue with their assault and supporting fire. If the force is well-disciplined and holds its ground, then the patrol members should make every effort to break contact as quickly as possible, and move to the last en route rally point to reorganize.

4 If the leader decides to break contact, he must be aware that the unit may have to provide suppressive fire until any WIA/KIA/disabled vehicles can be extracted from the kill zone.

5 Consolidate and Conduct 5 C's.

(d) IED Detonation with far ambush. In a far ambush, the killing zone is also under very heavy, highly concentrated fires, but from a greater range (out of hand grenade range). The greater range precludes those caught in the killing zone from conducting an assault. The greater range does, however, permit some opportunity for the men to maneuver and seek cover. If attacked from a far ambush:

1 Men in the kill zone immediately return fire, take the best available cover, and continue firing until directed otherwise.

2 Men not in the kill zone maneuver against the ambush force, as directed.

3 The unit leader either directs his unit and team leaders to fire and maneuver against the ambush force, or to break contact, depending on his rapid assessment of the situation.

4 If the leader decides to break contact, he must be aware that the unit may have to provide suppressive fire until any WIA/KIA/disabled vehicles can be extracted from the kill zone.

5 Consolidate and Conduct 5 C's.

(e) Chemical IED. Coalition forces have had several encounters with IEDs also having a chemical filler in conjunction with the explosive. Do to the complexity of manufacturing exact payloads the chemical effect is difficult to achieve. Units must be aware of the capabilities, and know what to do in the event of.

1 Move upwind, to high ground at least 240 meters away from release point.

2 Normal combat uniform provides some protection; add individual protective suits, masks and gloves will provide protection.

3 Collective Protection filters will provide protection.

4 Detectors will alarm however, the best warning comes from Marines sense of sight and smell.

**REFERENCES:**

- MCIP 3-17.01 Improvised Explosive Device Defeat
- JIEDDTF 05-23 Joint IED Defeat Task Force Counter IED Tactics, Techniques, and Procedures
- GTA 90-01-001 Improvised Explosive Device (IED) and Vehicular Borne Improvised Explosive Device (VBIED) Smart Card
- MCWP 3-11.2 Marine Rifle Squad
- CJTF-7 Ver 1.B OIF Smart Card 2, dtd 5 Dec 2003
- CJTF-7 Ver 1.A OIF Smart Card 3, dtd 23 Dec 2003

## APPENDIX

TWO PARALLEL CHAINS OF COMMAND

**SERVICE CHAIN OF COMMAND**

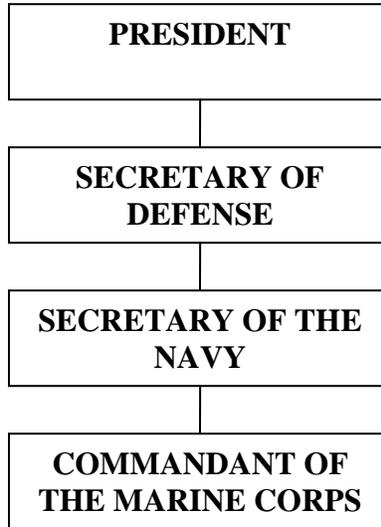


Figure 1

**OPERATIONAL CHAIN OF COMMAND**

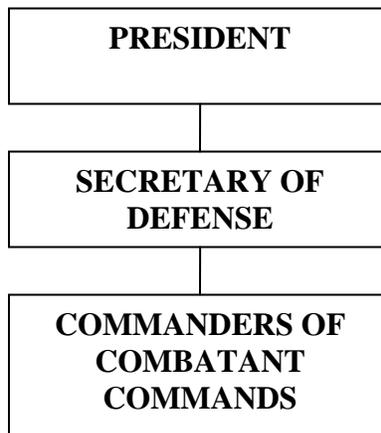


Figure 2

**FOUR BROAD CATEGORIES OF THE MARINE CORPS**

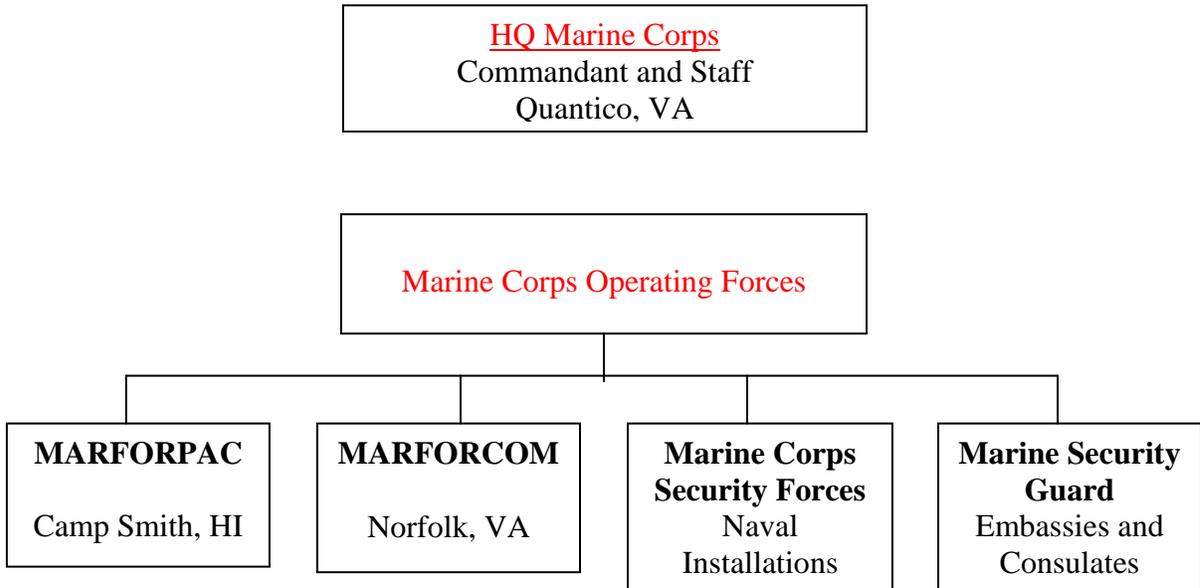


Figure 3

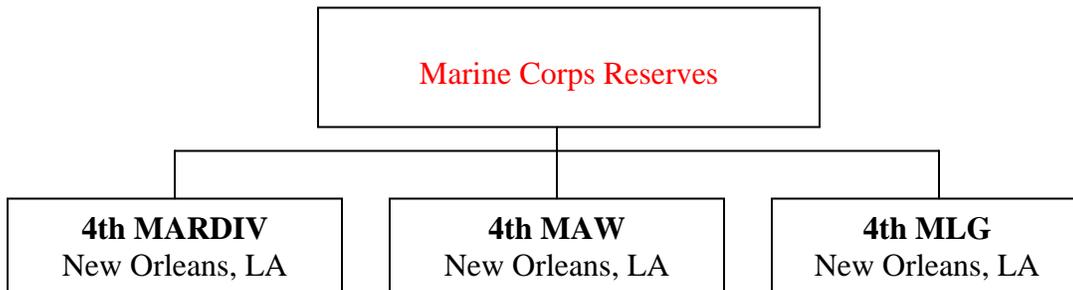


Figure 4

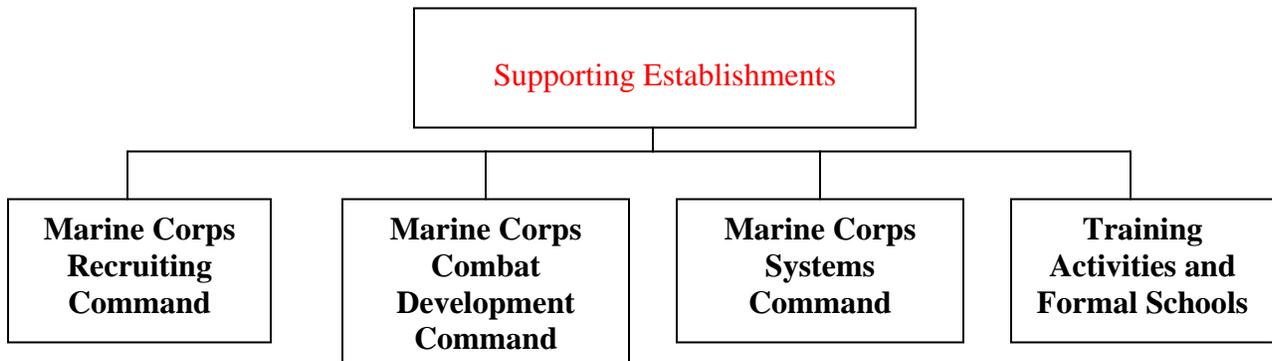


Figure 5

**CORE ELEMENTS**

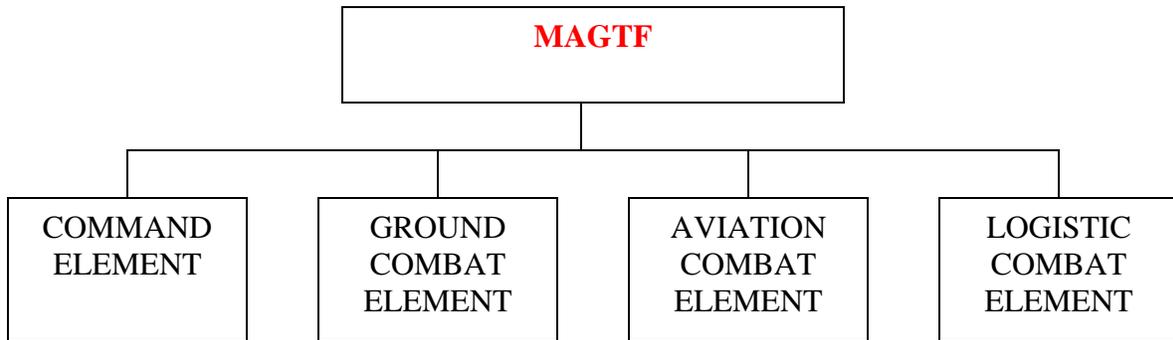


Figure 6

**TYPES OF MAGTF**

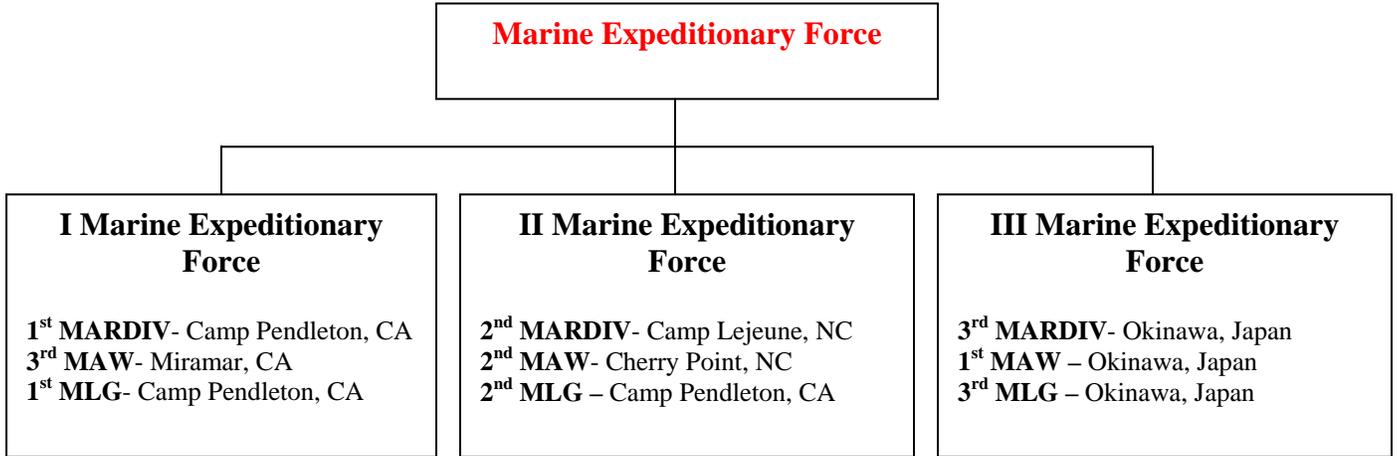


Figure 7

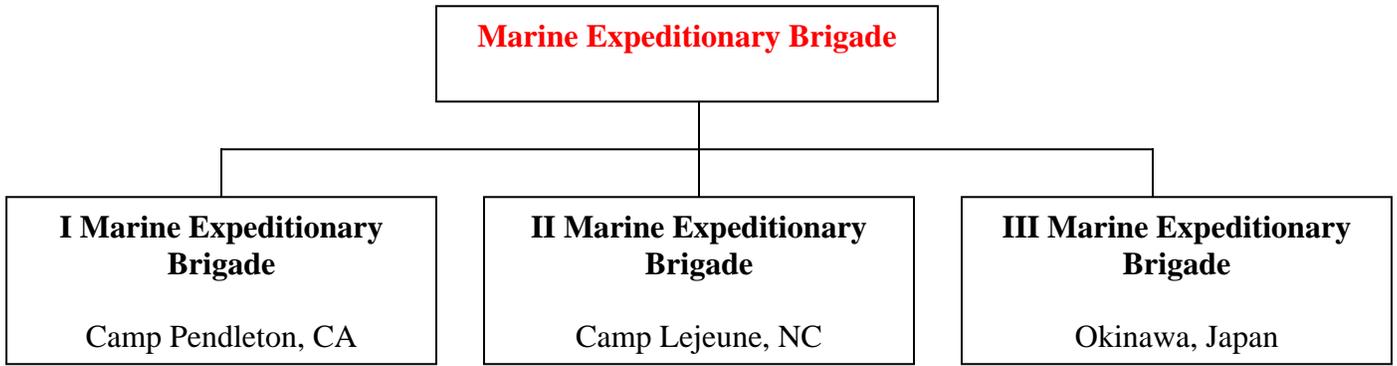


Figure 8

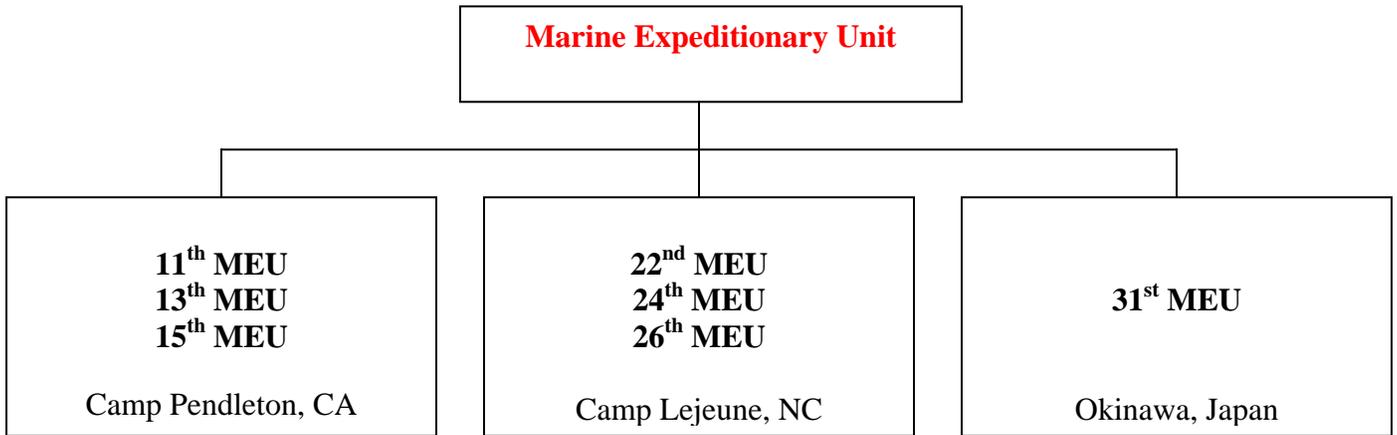


Figure 9

**FUNCTIONAL AREAS OF OPERATION WITHIN MAGTAF ELEMENTS**

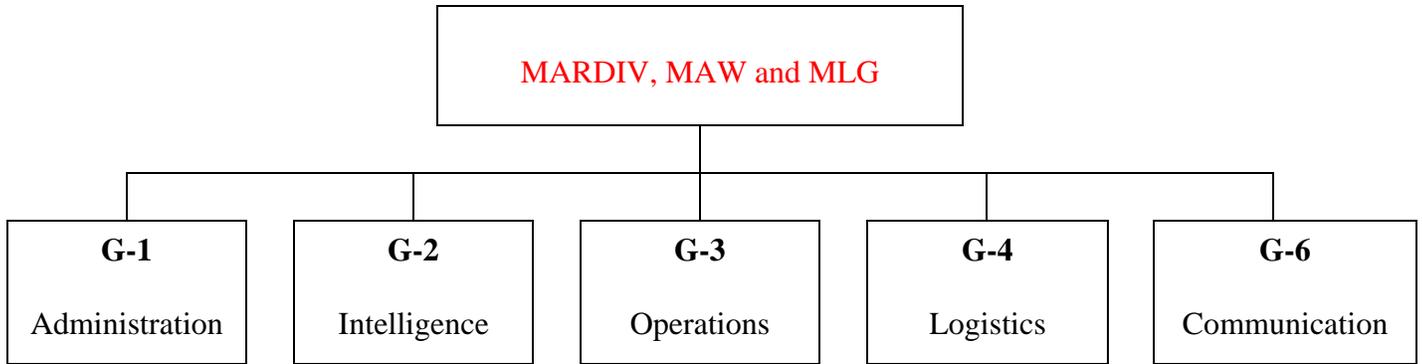


Figure 10

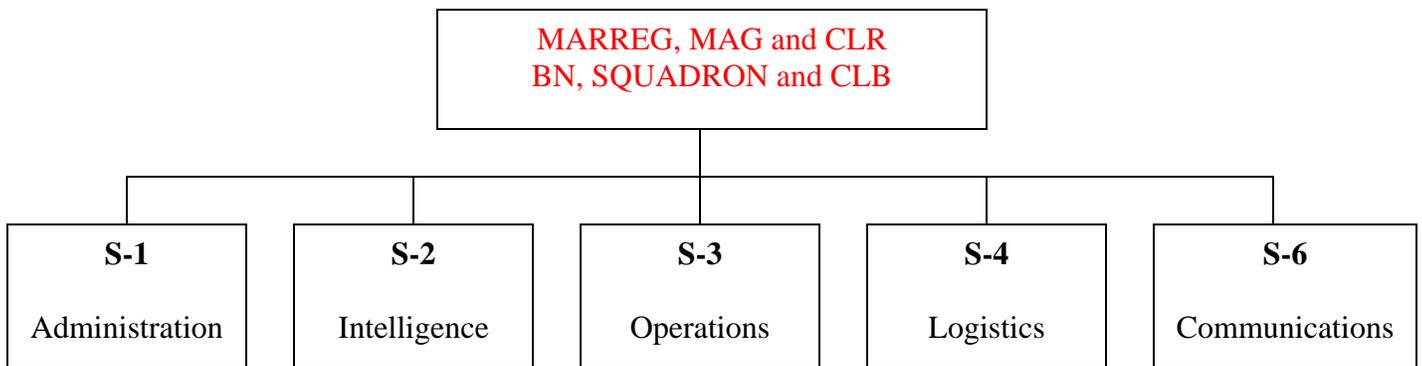


Figure 11

## APPENDIX A

### INSTRUCTIONS FOR NAAK Mk 1 Kit

Step 1. Stop breathing, close your eyes, don and clear the field protective mask, and pass the alarm. The mask and protective clothing are worn continually until the “all clear” signal is given.

Step 2. If nerve agent poisoning symptoms appear, immediately use the nerve agent antidote; administer ONE **NAAK Mk I**.

Step 3. Promptly remove any liquid nerve agent on the skin, clothing, and in the eyes by performing immediate decontamination to neutralize any liquid contamination.

Step 4. Upgrade protection to MOPP IV.

### **STUDENT NOTE**

If relief is obtained from one set of NAAK Mk I injections and breathing is normal, carry on with combat duties. Dryness of mouth is a good sign, meaning that enough atropine has been administered to carry on duties.

Step 5. Wait 10 to 15 minutes after giving yourself the first set of injections (takes that long for the antidote to take effect). If you are able to walk, know who you are, and know where you are, you **WILL NOT** need a second set of NAAK Mk I injections.

Step 6. If symptoms of nerve agent poisoning are not relieved after administering one set of NAAK Mk I injections, seek someone else to check your symptoms. A buddy must administer the second and third sets of injections, if needed.

## **BUDDY AID**

Step 1. Immediately mask the casualty if not masked.

Step 2. Check casualty for previous NAKK injectors. Position casualty on their side, in the swimmer's position.

Step 3. Administer the NAAK Mk 1 kit to the casualty in the same manner that you conducted self-aid. In Buddy-Aid, for severe symptoms you can administer up to a maximum of three NAAK Mk I in rapid succession (this includes previously self-administered injectors the casualty may have used during self-aid).

Step 4. If necessary, administer the CANA.

Step 5. Remove or neutralize any liquid contamination with the M291 Skin Decontamination Kit.

Step 6. Perform assisted ventilation (pressure arm lift method) if necessary.

## **Administering the NAAK Mk I – Self Aid**

(1) Stop breathing, close your eyes, don and clear the field protective mask, and pass the alarm.

(2) Administer one NAAK Mk I.

- (a) Remove NAAK Mk I from carrier.
  
- (b) Hold autoinjector by the plastic clip in nondominant hand with #2 on top.
  
- (c) Check injection site with dominant hand, ensuring there are no obstructions.
  
  
- (d) Grasp atropine autoinjector (#1) with dominant hand between thumb and first two fingers. Do not place finger or thumb over the needle.
  
  
- (e) Pull injector out of the clip.
  
  
- (f) Hold autoinjector with thumb and two fingers as you would a pencil.
  
  
- (g) Position the green end of the injector against the area to be injected.
  
  
- (h) Apply firm even pressure to the injector, until it pushes the needle in.
  
  
- (i) Hold in place for 10 seconds.
  
  
- (j) Remove injector.
  
  
- (k) Place used injector between pinky and ring finger of nondominant hand.

(l) Repeat steps (e) through (k) for 2 PAM CI (#2).

(m) Drop clip, retain injectors.

(n) Attach both injectors to the JSLIST left breast pocket.

(o) Massage injection site if time permits.

(3) Perform immediate decontamination to neutralize any liquid contamination.

(4) Don MOPP IV.

(5) Wait 10 to 15 minutes to determine where additional injections are necessary.

(6) Seek help if symptoms are not relieved.

#### 9. **Administering the NAAK Mk I / Assisted Ventilation – Buddy Aid**

(a) Immediately mask the casualty if not masked.

(b) Check casualty for previous NAAK injectors. Then, position casualty on their side, in the swimmer's position.

(c) Administer a maximum of three NAAK Mk I kits in rapid succession, using the same method as self-aid, above.

(d) Administer the CANA in the same manner as the NAAK Mk I, if necessary. Attach CANA injector to the JSLIST left breast pocket next to the NAAK Mk I expended injectors.

(e) Remove or neutralize any liquid contamination with the M291 Skin Decontamination Kit.

(f) Perform assisted ventilation (pressure arm lift method) if necessary.

(1) Ensure the casualty is masked.

(2) Do not kneel on the ground.

(3) Loosen the casualty's cartridge belt.

(4) Cross the arms across the chest and cross the legs.

(5) Grasp the casualty by the over garment; roll them away from you onto their stomach.

(6) Turn the casualty's head to the side so that the canister and outlet valve are not buried in the ground.

(7) Stand over the casualty at the shoulder or waist.

(8) Apply pressure with both hands in a sharp, downward direction to the middle of the back below the shoulder blades forcing air out.

(9) Grasp arm pits and lift the casualty 18-24 inches from the deck.

(10) Ease the casualty to the deck and turn the casualty's head to the side ensuring that the canister and outlet valve are not buried in the ground.

(11) Perform this procedure 10 – 12 times per minute at a steady rate.

(12) Continue until too physically exhausted to continue, relieved by medical personnel, relieved by another Marine, or the casualty resumes breathing.

(13) Treat the casualty for shock by placing the casualty's arms and hands on their chest, cover to keep them warm and elevating their lower extremities.

(14) Seek medical help.

(15) Medevac casualty as soon as possible.

## **GLOBAL POSITIONING SYSTEM**

*The ability to accurately determine position location has always been a major problem for soldiers. However, the global positioning system has solved that problem. Soldiers will now be able to determine their position accurately to within 10 meters.*

### **J1. DEFINITION**

The GPS is a satellite based radio navigational system. It consists of a constellation with 21 active satellites and 3 spare satellites that interfaces with a ground, air, or sea based receiver. Each satellite transmits data that enables the GPS receiver to provide precise position and time to the user. The GPS receivers come in several configurations, hand-held, vehicular mounted, aircraft-mounted, and watercraft mounted.

### **J2. OPERATION**

The GPS is based on satellite ranging. It figures the users position on earth by measuring the distance from a group of satellites in space to the user's location. For accurate data, the receiver must track four or more satellites. Three satellites can be used if the user manually inputs the altitude for that location. Most GPS receivers will provide the user with the number of satellites that it is tracking, and whether or not the signals are good. Some receivers can be manually switched to track only three satellites if the user knows his altitude. This method provides the user with accurate data much faster than that provided by tracking four or more satellites. Each type receiver has a number of mode keys that have a variety of functions. To better understand how the GPS receiver operates, refer to the operators' manual.

### **J3. CAPABILITIES**

The GPS provides worldwide, 24hour, all-weather, day or night coverage when the satellite constellation is complete. The GPS can locate the position of the user accurately to within 10 meters. It can determine the distance and direction from the user to a programmed location or the distance between two programmed locations called waypoints. It provides exact date and time for the time zone in which the user is located. The data supplied by the GPS is helpful in performing several techniques, procedures, and missions that require soldiers to know their exact location. Some examples are:

- Sighting.
- Surveying.
- Sensor or minefield emplacement.
- Forward observing.
- Close air support.
- Route planning and execution.

- Amphibious operations.
- Artillery and mortar emplacement.
- Fire support planning.

#### **J4. LIMITATIONS**

Until the 21 satellite constellation is complete, coverage may be limited to specific hours of each day in certain areas of the world. The GPS navigational signals are similar to light rays, so anything that blocks light will reduce or block the effectiveness of the signals. The more unobstructed the view of the sky, the better the system performs.

#### **J5. COMPATABILITY**

All GPS receivers have primarily the same function, but the input and control keys vary between the different receivers. The GPS can reference and format position coordinates in any of the following systems:

- **Degrees, Minutes, Seconds (DMS)** : Latitude/longitude based system with position expressed in degrees, minutes, and seconds.
- **Degrees, Minutes (DM)** : Latitude/longitude based system with position expressed in degrees and minutes.
- **Universal Traverse Mercator (UTM)** : Grid zone system with the northing and easting position expressed in meters.
- **Military Grid Reference System (MGRS)** : Grid zone/grid square system with coordinates of position expressed in meters.

The following is a list of land navigation subjects from other sections of this manual in which GPS can be used to assist soldiers in navigating and map reading:

a. **Grid Coordinates** - GPS makes determining a 4, 6, 8, and 10 digit grid coordinate of a location easy. On most GPS receivers, the position mode will give the user a 10 digit grid coordinate to their present location.

b. **Distance and Direction** - The mode for determining distance and direction depends on the GPS receiver being used. One thing the different types of receivers have in common is that to determine direction and distance, the user must enter at least one waypoint (WPT). When the receiver measures direction and distance from the present location or from waypoint to waypoint, the distance is measured in straight line only. Distance can be measured in miles, yards, feet, kilometers, meters, or nautical knots or feet. For determining direction, the user can select degrees, mils, or redds. Depending on the receiver, the user can select true north, magnetic north, or grid north.

c. **Navigational Equipment and Methods** - Unlike the compass, the GPS receiver when set on navigation mode (NAV) will guide the user to a selected waypoint

by actually telling the user how far left or right the user has drifted from the desired azimuth. With this option, the user can take the most expeditious route possible, moving around an obstacle or area without replotting and reorienting.

**d. Mounted Land Navigation** - While in the NAV mode, the user can navigate to a waypoint using steering and distance, and the receiver will tell the user how far he has yet to travel, and at the current speed, how long it will take to get to the waypoint.

**e. Navigation in Different Types of Terrain** - The GPS is capable of being used in any terrain, especially more open terrain like the desert.

**f. Unit Sustainment** - The GPS can be used to read coordinates to quickly and accurately establish and verify land navigation courses.



# GLOSSARY

## ACRONYMS AND GLOSSARY

### A

AA BN	Assault Amphibious Battalion
AAV	Assault Amphibian Vehicle
ACE	Aviation Combat Element
ADAL	Authorized Dental Allowance List
AMAL	Authorized Medical Allowance List
ASMRO	Armed Services Medical Regulating Office
ASP	Ammunition Supply Point

### B

BAMCIS	Begin the planning, Arrange recon, Make recon, Complete the plan, Issue the order and Supervise. 5 troop leading steps
BAS	Battalion Aid Station
BDE	Brigade
BLT	Battalion Landing Team
BMU	Beach Master Unit
BN	Battalion
Btry	Artillery Battery
BUMED	Bureau of Medicine and Surgery

### C

CASEVAC	Casualty Evacuation
CASREP	Casualty Report

CAT	Combat Action Tourniquet
CATF	Commander Amphibious Task Force
CAX	Combined Arms Exercise
CE	Command Element
CEB	Combat Engineer Battalion
CG	Commanding General
CINCNAVEUR	Commander in Chief, Naval Forces Europe
CINCPAC	Commander in Chief, Pacific
CINCPACFLT	Commander in Chief, U.S Pacific Fleet
CINCSOC	Commander in Chief, Special Operations Command
CINCUSNAVEUR	Commander in Chief, U.S Naval Forces Europe
CJTF	Commander, Joint Task Force
CLF	Commander, Landing Force
COMM	Communications
COMNAVSURFLANT	Commander, Naval Surface Force, Atlantic
COMNAVSURFPAC	Commander, Naval Surface Force, Pacific
CP	Command Post
CSSD	Combat Service Support Detachment

## D

D-Day	The unnamed day on which a particular operation commences or is to commence
Demarcated	Outlines, clearly defines

Displacement	The movement of supporting weapons from one firing position to another
Dissipation	Dispersion, break up
DIV	Division
Draw-D	Used in a defensive position. Meaning Defend, Reinforce, Attack, & withdraw
DSO	Division Surgeons Office
DTG	Date, Time, Group

**E**

Echelon formation	One of the four types of fire team formations, similar to skirmisher right and left except that one flank is angled to the rear
Envelopment	An attack made on one or both of the enemy's flanks or rear, usually accompanied by an attack to his front
EOD	Explosive Ordnance Disposal
ESB	Engineering Support Battalion

**F**

FEBA	Forward Edge of the Battle Area
FEX	Field Exercise
Flank	Area on the side between the ribs and pelvic bone (ileum)
Fleet Marine Force (FMF)	A balanced force of combined arms comprising of land, air, and sea service elements of the U.S Marine Corps
FO	Forward Observer

FDA Food and Drug Administration

FOD Foreign Object Damage

FPM Field Protective Mask

Frag Fragmentation

FREQ Frequency

## G

GAS Group Aid Station

GCE Ground Combat Element

GMO General Medical Officer

GP General Purpose

## H

Harassing Fire Fire designed to disturb the enemy troops to curtail movement and promote threat of losses to lower morale

HE High Explosive

H-Hour The specific hour on D-day that an operation commences

## I

IFAK Individual First Aid Kit

## J

JJDIDTIEBUCKLE Acronym for the fourteen leadership traits: Justice, Judgment, Dependability, Initiative, Decisiveness, Tact, Integrity, Enthusiasm, Bearing, Unselfishness, Courage, Knowledge, Loyalty, Endurance

**K**

KOCSA Key Terrain, Observation and Fields of Fire, Cover & Concealment, Obstacles, and Avenues of Approach

**L**

LAR BN Light Armored Reconnaissance Battalion

LCE Logistics Combat Element

**M**

MACG Marine Air Control Group

MAGTF Marine Air Ground Task Force

MAG Marine Air Group

MARDIV Marine Division

MARFOR Marine Forces

MARFORLANT Marine Forces-Atlantic

MARFORPAC Marine Forces-Pacific

MARFORORES Marine Corps Reserve

MAW Marine Aircraft Wing

MCO Marine Corps Order

MCSF Marine Corps Security Forces

MEB Marine Expeditionary Brigade

MEF Marine Expeditionary Force

METTAG Medical Emergency Triage Tag (NATO Card METTAG 137), provides a quick reliable method of

assessing casualties and assigning them with an appropriate triage/evacuation priority

MEU	Marine Expeditionary Unit
MLG	Marine Logistics Group
MMART	Mobile Medical Augmentation Readiness Team
MOLLE	Modular Lightweight Load-Carrying Equipment
MOPP	Mission-Oriented Protective Posture- MOPP is a flexible system of protection against chemical agents
MWHS	Marine Wing Headquarters Squadron
MWSG	Marine Wing Support Group

## N

NCA	National Command Authorities
NCO	Non-Commissioned Officer
NBC	Nuclear, Biological, Chemical

## O

OP	Observation Post
OSMEAC	Acronym for the five-paragraph order format: Orientation, Situation, Mission, Execution, Administration and Logistics, and Command and Signal

## P

Patrol	A detachment of ground, sea or air forces sent by a larger unit for the purpose of gathering information or carrying out a destructive, harassing, mopping-up or security mission
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## R

RAD	Radiation Absorbed Dosage, the method for measuring radiation exposure dosage
RAS	Regimental Aid Station
RDD	Radioactive Dispersive Device
RT	Receiver-Transmitter, the common item of all SINCGARS, the actual SINCGARS radio itself

## S

SALUTE	Used as an intelligence report when calling in an enemy sighting. Meaning Size, Activity, Location, Unit, Time, and Equipment
Sector of Fire	An area, limited by boundaries, assigned to a unit or to a weapon to cover by fire
SINCGARS	Single Channel Ground & Airborne Radio Systems
SPMAGTF	Special Purpose Marine Air Ground Task Force
S1	Personnel Office (Regimental / Battalion level)
S2	Intelligence section (Regimental / Battalion level)
S3	Training and Operations (Regimental / Battalion level)
S4	Supply and Logistics (Regimental / Battalion level)
S6	Communications

## T

TCCC	Tactical Combat Casualty Care (broken into 3 phases: care under fire, tactical field care, and combat casualty evacuation care)
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T / E Table of Equipment

T / O Table of Organization

U

V

Vee Formation Squad Vee, an inverted squad wedge, facilitates movement into a squad line and provides excellent firepower to the front and to the flank

VEE Venezuelan Equine Encephalitis – An acute viral disease transmitted from horses to humans by a variety of mosquito vectors, has potential for use as a biological warfare agent

VHF Viral Hemorrhagic Fever, caused by several viruses typically found in animals and infecting humans, some types cause a severe, usually fatal infection characterized by fever, widespread bleeding, and organ failure (has potential for use as a biological warfare agent)

VHF (radio) Very High Frequency (SINCGARS are VHF-FM radios that operate in the VHF range from 30.000 to 87.975 MHz)

W

Wedge formation A diamond shaped fire team formation which provides all around security and flexibility

WBGT Wet Bulb Globe Temperature

