U.S. Department of Homeland Security

United States Coast Guard

BOAT CREW HANDBOOK – First Aid

Revenue Cutter Bear

Relief Party Sighted Whaling Vessels

2d LT Bertholf; Dr. Call; 1st LT Jarvis

The Overland Expedition

BCH 16114.5
December 2017

The Overland Expedition

In 1897 an early Arctic winter stranded 300 whalers in eight ships stuck in ice without supplies north of the Arctic Circle at Point Barrow. The men faced starvation. President McKinley instructed the Treasury Department to entrust a rescue attempt to the Revenue Cutter Service. An urgent letter, dated November 15, 1897, from the Secretary of the Treasury to Captain Francis Tuttle, skipper of the BEAR, outlined the emergency.

Sending a ship into the Arctic in winter conditions was unheard of, but the BEAR was a "sailing battering ram" (Kroll), made of thick oak planks and iron. It was provisioned with one year's rations for the crew plus 12,000 rations for the whalers. In three short weeks the BEAR sailed out of Seattle headed north. Arctic ice would stop the cutter near Nome at Cape Vancouver. Reindeer herds had to be driven 1600 miles by dogsled in the Arctic winter to feed the starving whalers, who were suffering from scurvy.

In command of the BEAR was the brilliant, soft-spoken First Lieutenant David H. Jarvis. Second Lieutenant E. P. "Bully" Bertholf, later Commandant of the Coast Guard, was named as assistant to Jarvis. The third member of the BEAR's landing party was Dr. Samuel J. Call, an experienced ship's physician.

During the next hundred days Jarvis, Bertholf and Call endured Arctic temperatures of -40 F by day. They relied on native guides and villages to replenish their dogs and herd reindeer. On March 26, 1898, a beautiful clear day, the relief party sighted the most westerly of the icebound whaling vessels. On the 29th Jarvis and Call arrived at Point Barrow, followed by 400 reindeer. Dr. Call handled scurvy, frostbite and amputations. Bertholf remained at Point Hope until the ice melted and the BEAR could reach the whalers. He enforced the law in the area, destroying stills and investigating crimes.

When the cutter BEAR broke through to Point Barrow on July 28, Captain Tuttle was greatly relieved to find that the Overland Expedition had been a glorious success and that all but a few of the whaling men had survived. Laden with survivors, the BEAR arrived at Seattle on September 13, 1898, almost ten months after its feverish departure the previous December.

Jarvis, Bertholf, and Call were recommended by President McKinley for decoration. Gold medals voted by Congress were presented to them in 1902 with expressions of thanks.

https://www.uscg.mil/history/articles/johnson_overland_expedition.asp

Douglas Kroll, Commodore Ellsworth Bertholf (Naval Institute Press, 2002)

United States Treasury Department. *Report of the Cruise of the U.S. Revenue Cutter* Bear *and the Overland Expedition for the Relief of the Whalers in the Arctic Ocean, from Nov 27, 1897 to Sep 13, 1898*. Washington: GPO, 1899. (Primary source of information; by participants of the expedition. Contains Jarvis' journal entries.)

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Ref: a. *Coast Guard Medical Manual, COMDTINST M6000.1 (Series)*

1. PURPOSE. This Handbook describes accepted first aid practices that, along with practical training in their performance, will aid boat crews in delivering effective medical care that preserves life, prevents a victim's condition from worsening, and promotes their speedy recovery. The major topic within this handbook is basic First Aid.

2. DIRECTIVES AFFECTED. The Boat Crew Seamanship Manual, COMDTINST M16114.5C, is canceled.

3. DISCUSSION. This Handbook provides guidance on the application of first aid in maritime environments and situations.

4. MAJOR CHANGES. First issue.

5. DISCLAIMER. This guidance is not a substitute for applicable legal requirements, nor is it itself a rule. It is intended to provide operational guidance for Coast Guard personnel and is not intended to nor does it impose legally-binding requirements on any party outside the Coast Guard.

6. IMPACT ASSESSMENT. No impact assessment warranted.

7. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS.

   a. The development of this Handbook and the general guidance contained within it have been thoroughly reviewed by the originating office in conjunction with the Office of Environmental Management, and are categorically excluded (CE) under current USCG CE #33 from further environmental analysis, in accordance with Section 2.B.2. and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1 (series). Because this Handbook contains guidance documents that implement, without substantive change, the applicable Commandant Instruction and other guidance documents, Coast Guard categorical exclusion #33 is appropriate.

   b. This Handbook will not have any of the following: significant cumulative impacts on the human environment; substantial controversy or substantial change to existing environmental conditions; or inconsistencies with any Federal, State, or local laws or administrative determinations relating to the environment. All future specific actions resulting from the general guidance in this Handbook shall be individually evaluated for compliance with the National Environmental Policy Act (NEPA), Department of Homeland Security (DHS) and Coast Guard NEPA policy, and compliance with all other environmental mandates.

7. DISTRIBUTION. No paper distribution will be made of this Handbook. An electronic version will be located on the Office of Boat Forces (CG-731) Portal site: https://cg.portal.uscg.mil/units/cg731/SitePages/Manuals.aspx.

8. FORMS/ REPORTS. None

9. REQUESTS FOR CHANGES. To recommend edits and changes to this Handbook, please submit a formal request at the following link: https://cg.portal.uscg.mil/communities/bfco/doctrine/SitePages/Home.aspx.

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J. BRIAN RUSH
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CHAPTER 1
Introduction

Section A. Purpose of this Handbook

Introduction

This Handbook describes accepted first aid practices that, along with practical training in their performance, will aid boat crews in delivering effective medical care that preserves life, prevents a victim's condition from worsening, and promotes their speedy recovery. The major topic within this handbook is basic First Aid.

The capability to sustain the life of those who have been rescued is just as important as searching for and rescuing survivors. Vessels at sea are often far removed from advanced medical care and are reliant on the Coast Guard and other professional maritime responders to provide first aid for those suffering a sudden illness or injury. This aid includes both initial interventions and transport to higher levels of care for serious conditions, such as performing cardiopulmonary resuscitation (CPR) while making way toward a waiting ambulance on shore, and complete treatment of minor conditions, such as applying a dressing to a wound. Certain skills are considered essential to providing this initial level of care, particularly those related to the "CAB's" or compressions, airway, and breathing, which focus on critical life saving interventions that must be rendered before treatment of less serious injuries.

In this Section

This Section contains the following information:

Title	See Page
Procedures	1-1

Procedures

This Handbook is not intended to cover every contingency that may be encountered during mission execution or training. Successful operations require the exercise of good safety practices, sound judgment and common sense at all levels of command.

Section B. How to Use this Handbook

Introduction

Each *Part* of this handbook includes its own table of contents and is divided into chapters.

In this Section

This Section contains the following information:

Title	See Page
Part Layout	1-2
Warnings, Cautions, and Notes	1-2

Part Layout

The first page of each *Part* includes an *Introduction,* and an *In this Part* (which lists each chapter title).

The first page of each chapter includes an *Introduction,* an *In this Chapter*, and *References for this Chapter*, as applicable.

The first page of each section includes an *Introduction*, an *In this Section*, and *References for this Section*, as applicable.

In the left column of each page is the block title, which provides a descriptive word or phrase for the corresponding block of text across from it.

Warnings, Cautions, and Notes

The following definitions apply to "Warnings, Cautions, and Notes" found throughout the Handbook.

WARNING

Operating procedures or techniques that must be carefully followed to avoid personal injury or loss of life.

CAUTION!

Operating procedures or techniques that must be carefully followed to avoid equipment damage.

NOTE

An operating procedure or technique that is essential to emphasize.

CHAPTER 2
First Aid

Introduction

This Chapter provides basic first aid information for injuries encountered in the marine environment. First aid is doing what must be done before advanced treatment is available. It may include:

(01) Providing immediate temporary assistance,
(02) Saving life,
(03) Preventing further injury or unfavorable progression,
(04) Preserving vitality and resistance to infection,
(05) Transporting the victim to a higher level of care if necessary.

In this Chapter

This Chapter contains the following sections:

Section	Title	See Page
A	Crewmembers' Roles	2-2
B	Motion Sickness	2-6
C	Treatment for Shock	2-8
D	Resuscitation Methods and Emergencies	2-15
E	Treatment for Wounds, Fractures, and Burns	2-22
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Section A. Crewmembers' Roles

Introduction

Proper knowledge and skill in first aid is essential for boat crewmembers. A well-trained crew that responds effectively and professionally to an emergency situation may be the difference between life and death or temporary injury and disability of the victim.

In this Section

This Section contains the following information:

Title	See Page
Responsibilities	2-2
Handling and Transporting of Injured	2-4

A.1. Responsibilities

Effective first response/emergency medical care does not come easily. Boat crews render first aid, consistent with their training, in their role as first responders. Your unit should always be advised of emergency medical situations. Your unit or parent command will activate an established Emergency Medical Services (EMS) system such as 911, or local fire/rescue squad. Crewmembers providing first aid must do the following:

(01) Assess the safety of the scene. Scene safety must be secured prior to initation of patient care,

(02) All appropriate personnel protective equipment should be worn prior to contact with patient,

(03) Assess the patient's breathing, pulse, mental status, level of consciousness, and injuries or illness,

(04) Determine if first aid can be administered on scene or if MEDEVAC is advised or victim requires higher level of care. **Briefing the operational commander to request a MEDEVAC if needed**,

(05) Place the patient in a position of comfort unless spinal immobilization is needed,

(06) Provide a full report of patient care to the EMS unit responding to the scene or who assume custody. Document the name of the responding EMS unit, the time of transfer, and the patient condition at the time of transfer.

A.1.a. Scene Assessment

When responding, a quick survey of the scene is performed. An unsafe scene should not be entered until the crew is fully prepared and protected against hazards such as exposed live electrical wires, toxic vapors, fire, blood, or body fluids. As rescuers, it's important for the surrounding area to be safe and free of hazards before attempting first aid. Rescuer injury while administering first aid will only complicate an already difficult situation.

A.1.b. Initial Patient Assessment

Boat crewmembers should stop and assess the overall condition of the victim, and determine whether or not assisting the patient with the resources at hand is possible or if it requires further help. When more definitive care is required for more serious injury cases, assistance should be sought immediately by calling for help and activating the local EMS system. The following information is important to notice during an initial assessment:

(01) Number of patients,
(02) General condition of patient(s),
(03) Mechanism (type) of injury,
(04) Patient(s) level of consciousness (LOC). A patient's LOC may be altered for numerous reasons. Some of these include:
   a) Mechanisms consistent with a serious injury such as a gunshot wound, fall from a great height, major burn, crushing accident, etc,
   b) If the patient's state-of-health has been compromised, for example, prolonged exposure to the elements, dehydration, malnourishment, ingestion of a substance, etc.

NOTE

In this Section, serious injury cases are considered those that need attention from a medical professional. A serious injury case also may be one in which the crew decides the injury is beyond its medical capabilities.

WARNING

Unprotected crewmembers who come in direct contact with bloodborne pathogens shall immediately report each incident to their unit CO/OIC, servicing medical facility, and follow professional medical advice. Refer to reference (a) for more information.

A.1.c. Protective Devices	Some bodily fluids (blood, cerebrospinal fluid, amniotic fluid, fluids tainted with blood, etc.) are potentially infectious. These fluids may contain bloodborne pathogens such as the Hepatitis B virus, Hepatitis C virus, and HIV which cause Hepatitis B, Hepatitis C and AIDS, respectively. Crewmembers should take all reasonable precautions to prevent direct contact with human blood or other bodily fluids by wearing Personal Protective Equipment (PPE) such as clean disposable gloves or more complete equipment depending on the degree of contamination before making contact with the patient. If available, face masks should be worn in any instance of known or suspected respiratory infection (i.e., TB). Blood-soaked gloves and other material should be disposed of with great care. A medical clinic or emergency room can be contacted for disposal advice. Coast Guard units should maintain information on medical waste disposal.
A.2. Handling and Transporting of Injured	Transporting ill and/or injured persons aboard boats to medical treatment facilities is a serious problem regularly encountered by boat crewmembers. In many situations, it is difficult, if not impossible, for medical help to reach victims. Therefore, the boat crew must possess a basic knowledge of how to transport ill and/or injured persons safely and quickly to a location where appropriate medical treatment is available.
A.2.a. Boat Crew Responsibility	The sooner a victim arrives at a place where medical attention is available, the better. It is the responsibility of the coxswain and crew to safely transport the victim as rapidly as possible, while preventing further injury or unnecessary pain.

A.2.b. Moving a Patient

Moving a patient is precise work and any carelessness is unacceptable. It requires close teamwork and great care. Even procedures that may seem simple and obvious, such as placing a patient on a back board or in a stokes litter, requires training, coordination, and skill.

These are important rules to remember when transporting an injured person:

(01) Notify unit or Sector command so that appropriate medical resources can be activated,
(02) If possible, avoid moving the patient until that person is examined and all injuries are protected by properly applied splints, dressing, etc,
(03) If head or neck injury is suspected, immobilize the patient's spinal cord prior to movement (e.g., by securing the patient to a back board),
(04) Seek assistance before moving a patient (i.e. contact a Coast Guard Flight Surgeon),
(05) For conscious patients, always explain the move procedure in advance,
(06) Patient movements should be careful, deliberate, and the minimum required.

Section B. Motion Sickness

Introduction

Motion sickness, or seasickness, is nausea and/or vomiting caused by an imbalance between visual images and the portion of the middle ear that senses motion. This Section discusses the causes and symptoms of motion sickness, as well as the methods of prevention.

In this Section

This Section contains the following information:

Title	See Page
Causes of Motion Sickness	2-6
Symptoms	2-6
Risk Management	2-7
Prescription Medication Restrictions	2-7

B.1. Causes of Motion Sickness

Mental and physical stress, as well as the rolling or pitching motion of a boat, contribute to motion sickness. Focusing on the chartplotter or radar, reading chart work, or other tasks that require close attention, will aggravate motion sickness.

B.2. Symptoms

The motion of the boat, especially when the boat's heading produces a wallowing or rolling motion, can cause the typical symptoms of nausea and vomiting. The primary symptoms of seasickness are as follows:

(01) Nausea and vomiting,
(02) Increased salivation,
(03) Unusual paleness,
(04) Sweating,
(05) Drowsiness,
(06) Overall weakness,
(07) Stomach discomfort.

B.3. Risk Management

Besides taking medication, there are other things that can be done to help prevent seasickness:

(01) Stay out of confined spaces,

(02) Stay above deck in the fresh air,

(03) Avoid concentrating on the movement of the boat by looking out over the water toward the horizon or shoreline,

(04) Avoid smoking.

Motion sickness can often be prevented or made less severe with different kinds of anti-motion medication, including the use of Scopolamine patches. Boat crewmembers who are especially susceptible to motion discomfort should be seen by medical personnel and prescribed anti-motion medication. The medication should be taken throughout their watch since they never know when they will be dispatched on a mission. Medication taken just before getting underway will not have its maximum effect during the mission.

CAUTION !

Some anti-motion sickness medications may cause drowsiness. Consult a medical professional to determine if alternatives are available.

B.4. Prescription Medication Restrictions

Prescribed anti-motion sickness medication must not be taken under the following circumstances:

(01) Without medical supervision,

(02) Within 12 hours of alcohol consumption,

(03) If pregnant, unless approved by primary care physician.

Section C. Treatment for Shock

Introduction

Shock can be difficult to identify early and if untreated can quickly become life threatening. It may be effectively reduced or eliminated if proper steps are taken. It is important that crewmembers understand how to identify and treat shock. Shock may accompany an injury and can reduce a victim's ability to deal with and survive serious injuries. Shock by itself, even when no injuries are involved, can be very serious and life threatening. Crewmembers must be aware of the symptoms of shock and the events that cause shock.

In this Section

This Section contains the following information:

Title	See Page
Shock	2-8
Anaphylactic Shock	2-12

Shock

C.1. Description

Shock is a depressed physiological or mental state. Shock develops when poor blood flow creates a shortage of oxygen being delivered throughout the body. The signs and symptoms of shock can change throughout treating an injury and are unique for every casualty. Signs and symptoms may develop rapidly or be delayed for up to several hours after the apparent cause. The symptoms of shock usually precede the signs. Several types of shock exist, therefore, recognizing and treating shock immediately is important.

NOTE

Shock can occur at anytime during first aid treatment. The patient should be assessed for its presence during the responder's initial assessment and reassessed for its presence throughout treatment.

C.2. Causes

Some events that typically cause shock are:

(01) Trauma (internal or external bleeding, blunt force [e.g., a fall, being struck by a blunt object, etc.], fractures, and burns),
(02) Allergic reaction,
(03) Hypothermia,
(04) Drugs,
(05) Toxins,
(06) Heart attack,
(07) Illnesses such as diabetes,
(08) Dehydration,
(09) Emotional reaction.

C.3. Symptoms vs. Signs

A symptom is subjective evidence of a condition that only the patient can feel. A sign is objective evidence of a condition that can be observed by others in addition to the patient.

C.4. Shock Symptoms

Symptoms of shock include:

(01) Restlessness,
(02) Thirst,
(03) Nausea,
(04) Weakness,
(05) Anxiousness,
(06) Fright,
(07) Dizziness,
(08) Fatigue,
(09) Feeling of impending doom.

C.5. Shock Signs

Signs of shock include:

(01) Pulse – weak and rapid,
(02) Breathing – shallow and rapid,
(03) Skin – pale, cold, clammy (sweating),
(04) Pupils – dilated (enlarged),
(05) State of consciousness – alert (may be deceiving) to fainting and/or unconscious.

C.6. Assessment

Strong signs and symptoms of shock can be identified by skin color, pulse rate, monitoring respiration, and a victim's level of consciousness. The following table describes the strong signs of shock.

Area	Normal	Signs of Shock
Skin color	Adult skin is normally dry, not excessively pale or wet to the touch.	A person in shock may have pale looking skin that is cold and clammy to the touch.
Eyes	Responsive to movement and light conditions.	Pupils appear to be dilated. May have a dazed look
Pulse	Normal pulse for an adult is regular, strong, and between 60-100 beats per minute.	A shock patient will appear restless, and has a pulse that feels weak and is more rapid than normal, usually greater than 100 beats per minute. With continuing worsening the pulse rate may slow down.
Respiration	Normal adult respiration is between 12-20 breaths per minute.	Initial response is to have a shallow rapid breathing (greater than 20 breaths per minute). With continued worsening the breathing rate may become slow (less than 12 breaths per minute). Immediate assistance is required in these instances to avoid respiratory arrest.
Consciousness	Fully alert.	Person can appear anywhere from alert (may be deceiving) to unconscious. Any time a patient's level of consciousness is other than fully alert, it is a serious indication to seek medical assistance immediately.

C.7. Treatment

Shock is progressive and worsens with time. It is critical to treat for shock as soon as it identified. To properly treat for shock, boat crewmembers must administer initial treatment, followed by executing steps to ensure the effects of shock are kept at a minimum.

C.7.a. Initial Treatment

Initial treatment for shock includes limiting a patient's activity, ideally having the person lie down and remain alert for the signs and symptoms of shock. If unconscious, appropriate treatment is to activate EMS and institute resuscitation procedures.

Always assess the patient for major bleeding, and treat any external bleeds that could be life threatening with a pressure dressing, hemostatic dressing, and tourniquet as needed, assess/treat airway issues if the patient is not breathing adequately.

Never assume that a patient without an obvious visible injury displaying signs of shock is not in shock! Shock should be assumed to be due to internal bleeding until proven otherwise. The patient may appear anxious, confused about recent events, and their skin may be cool/damp to touch. As shock progresses the patient's symptoms will continue to worsen, therefore it is important to render care immediately and rapidly get he/she to a higher level of care.

If CPR is not necessary, the victim should remain lying down, should be kept warm, if not already overheated, and should be checked for other injuries.

C.7.b. Continuing Treatment

Additional procedures must be followed and completed in order to control the effects of shock upon the victim:

(01) Check for "medic alert" or other information tags,
(02) Obtain history for medical problems (heart disease, diabetes, allergies, medications),
(03) Notify unit or parent command to obtain help and transport as advised,
(04) Provide specific treatment if advised and trained to do so,
(05) Be careful not to worsen any other injuries,
(06) Perform CPR, if indicated and trained to provide,
(07) Insulate on top and underneath with a blanket to prevent heat loss, Be careful not to overheat. If hot, do not warm,
(08) If conscious, moisten lips, if requested,
(09) Do not allow patient to eat or drink,
(10) Never give alcohol,
(11) Handle gently.

Anaphylactic Shock

C.8. Description Anaphylactic shock is a rapid, extreme allergic reaction. Swelling in the throat and airways and a drop in blood pressure may occur. People who are subject to this type of shock should carry medical identification at all times. Sensitivity reactions can occur within seconds of contact and can result in death within minutes of contact. It is imperative to be able to recognize the signs and symptoms of anaphylactic shock in order to relay the gravity of the situation to qualified medical personnel.

C.9. Causes Anaphylactic shock can be caused by ingesting peanuts and tree nuts, fish, shellfish, taking antibiotics or aspirin, exposure to latex, and being stung by bees, yellow jackets, wasps, hornets and fire ants among other substances.

C.10. Symptoms Symptoms of anaphylactic shock include:

(01) Skin: itching or burning, hives (raised rash), flushing (redness), cyanosis (a bluish color) around the lips,

(02) Swelling of lips, tongue, feet, throat, hands (tingling of the lips, mouth, and tongue and a feeling of a tightness in the throat are also common),

(03) Respiratory tract: wheezing, shortness of breath, coughing,

(04) Headache,

(05) Altered mental status,

(06) Loss of consciousness.

Onset of symptoms may be rapid, within seconds, or delayed. The signs for anaphylaxis are the same as those of shock.

C.11. Assessment

Anaphylactic shock is a severe, sometimes life-threatening, allergic reaction that can occur within minutes of exposure to an offending substance. The substance may enter the body orally, by breathing or through skin contact. Anaphylactic shock can be identified by visual changes to the subject's normal appearance and by changes in vital signs. The following table provides indications that a person may be encountering anaphylactic shock.

Area	Normal	Signs of Shock
Skin color	Adult skin is normally dry, not excessively pale or wet to the touch.	Sudden appearance of hives. Widespread blotchy swelling of the skin. Flushing, bluish skin color (especially around the lips).
Eyes	Responsive to movement and light conditions.	Pupils may be dilated.
Pulse	Normal pulse for an adult is regular, strong, and between 60-100 beats per minute.	Increased pulse rate, or weak pulse accompanied by a drop in blood pressure (shock). Blood pressure remains low even when lying down.
Respiration	Normal adult respiration is between 12-20 breaths per minute.	Wheezing or difficulty in breathing. Chest tightness. Coughing. Throat swelling, hoarseness or obstructed air flow.
Consciousness	Fully alert.	Light-headedness or fainting. Any time a patient's level of consciousness is other than fully alert, it is a serious indication to seek medical assistance immediately.

C.12. Treatment Anaphylactic shock requires medication to counteract the allergic reaction to the substance. If the victim carries an epinephrine kit (Epi-pen), crewmembers may assist them in administration, if trained. The victim should be treated for shock and, if necessary, administered CPR. All that is observed or performed should be recorded while keeping the unit or parent command appraised of the situation so that appropriate medical resources can be activated. Medical attention should be obtained regardless of patient's response. Anaphylactic shock can be very serious resulting in death within a few minutes.

Section D. Resuscitation Methods and Emergencies

Introduction

When a person stops breathing, known as respiratory arrest; seconds count. Death can occur within four to six minutes after respiratory failure. Respiratory arrest is different from (but may be caused by) cardiac arrest. It is imperative to start resuscitation immediately in both Respiratory Arrest and Cardiac Arrest. Auxiliary crewmembers, although not required, are encouraged to maintain their skills through training by qualified, certified instructors, and maintain their record of certification.

Events that may cause people to stop breathing include:

(01) Near drowning,
(02) Suffocation,
(03) Electrocution,
(04) Poison gas,
(05) Cardiac arrest,
(06) Drug overdose,
(07) Choking,
(08) Chest injury,
(09) Various lung diseases,
(10) Stroke.

In this Section

This Section contains the following information:

Title	See Page
Resuscitation Procedures	2-16
Heart Attack	2-18
Stroke	2-19
Scuba Incidents	2-20

Resuscitation Procedures

D.1. Description Resuscitation is a general term that covers all measures taken to restore life or consciousness to an individual. Measures taken to restore life include artificial respiration, and CPR.

D.2. Artificial Respiration Artificial respiration, starting normal respiratory function, includes rescue breathing maneuvers such as mouth-to-mouth, mouth-to-nose, and mouth-to-stoma. A stoma is the opening in the lower neck through which individuals breathe when they have had their voice box removed.

D.3. Cardiac Compression Cardiac compression is a method used to restore normal blood-flow to the brain.

D.4. CPR CPR uses both artificial respirations and chest compressions to revive a victim in cardiac arrest. The standard protocols of shore-based civilian EMS systems usually require starting CPR in the field and rapidly transporting these patients to a hospital for continued resuscitation efforts. However, maritime SAR operations usually involve prolonged response, which exceed the accepted response intervals for successful resuscitation. Furthermore, the responders have increased operational risks management decisions, which must also be considered with the probability of patient benefit. Risks include aircraft and vessel mishaps, personal injury, and blood borne pathogen exposures. There are also the emotional risks to rescuers and families associated with futile resuscitation efforts.

CPR courses focus on the need to rapidly identify when someone is experiencing a sudden cardiac arrest. Some common causes of sudden cardiac arrest are heart disease, electrical shock, severe blood loss, drug overdose, severe allergic reaction, and drowning.

D.4.a. Obstructed Airway Procedures

An obstruction to the airway such as choking on an object can cause a victim to stop breathing or the inability to provide rescue breathing. The following procedures should be performed if the victim begins choking:

	Adult	Child	Infant
Assess Patient	-Ask, "Are you choking?" -If patient nods yes, or is unable to speak or cough – Act! -If available, have Team or bystander activate EMS	-Ask, "Are you choking?" -If child nods yes, or is unable to speak or cough – Act! -If available, have Team or bystander activate EMS	-Look at infants face -If infant is silent, unable to cry, or has blue lips, nails, or skin – act! -If available, have Team or bystander activate EMS
Position Yourself	-Stand behind patient -make a fist with one hand and place thumb side against abdomen, just above navel and below ribs -Grasp fist with other hand	-Kneel behind child -make a fist with one hand and place thumb side against abdomen, just above navel and below ribs -Grasp fist with other hand	-Straddle infant face-down over your forearm, with head lower than chest -Support head by holding jaw -Using heel of other hand, give 5 back blows between shoulder blades
Give Thrusts	-Quickly thrust inward and upward into abdomen -Repeat. Each thrust needs to be given with intent of expelling object -Continue until patient can breathe normally	-Quickly thrust inward and upward into abdomen -Repeat. Each thrust needs to be given with intent of expelling object -Continue until child can breathe normally	-Sandwich infant between your forearms and turn onto back, with legs and arms straddling your other arm -Place 2 fingers on breastbone just below nipple line and give 5 chest thrusts -Repeat back blows and chest thrusts until infant can breathe normally or goes unconscious -Back blows and thrusts need to be given with intent of expelling object
If Patient Becomes Unresponsive	-Carefully lower to deck. Position face-up on a firm, flat surface -If not done already, have Team or bystander activate EMS if available -Begin CPR, starting with compressions	-Carefully lower to deck. Position face-up on a firm, flat surface -If alone, provide at least 2 minutes of care before activating EMS. -Begin CPR, starting with compressions	-Carefully lower to deck. Position face-up on a firm, flat surface -If alone, provide at least 2 minutes of care before activating EMS. -Begin CPR, starting with compressions
Remove Any Object if Seen	-Look in mouth for an object after each set of compressions, before giving rescue breaths -Continue until patient shows obvious signs of life, or another provider or next level of care takes over	-Look in mouth for an object after each set of compressions, before giving rescue breaths -Continue until child shows obvious signs of life, or another provider or next level of care takes over	-Look in mouth for an object after each set of compressions, before giving rescue breaths -Continue until infant shows obvious signs of life, or another provider or next level of care takes over

Table 2-1
Obstructed Airway Procedures

Heart Attack

D.5. Description A heart attack is always considered a medical emergency since the victim is in significant danger of going into cardiopulmonary arrest and dying. Medical assistance should be contacted immediately. Whenever a heart attack is suspected, be prepared for the possibility of sudden cardiac arrest, and the need for CPR.

D.6. Symptoms There are many symptoms of a heart attack, some of which may not be noticed or recognized by a victim. Though heart attacks can occur without displaying all of these symptoms, the following are all symptoms of a heart attack:

(01) Severe, crushing type of pain under the breastbone, arms, neck, and jaw,
(02) Profuse sweating,
(03) Shortness of breath,
(04) Extreme anxiety,
(05) Nausea and vomiting,
(06) Bluish discoloration of lips, fingernails, and skin,
(07) Women often do not experience these signs and will describe indigestion, weakness, or fatigue, and back pain.

D.7. Treatment The following is the treatment for a heart attack:

(01) Keep the victim calm,
(02) Loosen any tight fitting clothing,
(03) Administer oxygen (if available and trained to do so),
(04) Place the victim in the position of most comfort. Sometimes the victim may want to sit up, especially if the person is short of breath,
(05) Seek immediate medical assistance, activate local EMS,
(06) Determine if the victim is on any type of medication for a heart condition such as nitro-glycerine or aspirin. If so, determine if the victim has taken the medication as prescribed,
(07) Reassure the patient that assistance is on the way or that transport to a hospital is imminent,
(08) Transport as quickly, but as safely, as possible.

Stroke

D.8. Description A stroke is any interruption of the blood supply to the brain. This is most commonly a result of bleeding or clotting affecting the blood vessels of the brain. All strokes are extremely serious regardless of how severe they appear to be. Seek medical attention immediately. Early recognition and treatment is critical to minimize or prevent more serious complications. Whenever a stroke is suspected, be prepared for the possibility of sudden cardiac arrest, and the need for CPR.

D.9. Symptoms The symptoms of a major stroke are:

(01) Unconsciousness,
(02) Shock,
(03) Confusion,
(04) Dizziness,
(05) Numbness/weakness to one side of the body,
(06) Seizures,
(07) Impaired vision,

Minor symptoms may be:

(08) Headache,
(09) Facial droop,
(10) Arm Weakness - or difficulty in using a limb,
(11) Difficulty speaking,
(12) A change in the ability to understand.

D.10. Memory Aid The acronym FAST is a good way to remember the symptoms of a stroke and a quick way to check:

(01) F – Facial Drooping - Ask the person to smile, check for an even smile,
(02) A - Arm weakness - Have person raise arms and see if one drops or can't be held in place,
(03) S – Speech Difficulty – Slurred Speech, Hard to understand, etc,
(04) T – Time is critical – If the symptoms above are observed, get medical assistance quickly.

D.11. Treatment The following is the treatment for stroke:

(01) Activate EMS,
(02) Obtain medical assistance immediately,
(03) Treat for shock,
(04) If the victim has difficulty breathing, help the person maintain an open airway and provide rescue breathing if in respiratory arrest,
(05) If the patient's level of responsiveness is or becomes severely diminished, consider placing the person in a recovery position to protect the airway.

Scuba Incidents

D.12. Types of Scuba Incidents Scuba diving accidents include all types of body injuries and near drowning. There are two special problems usually seen in scuba diving accidents:

(01) Arterial Gas Embolism (AGE), sometimes called air emboli;
(02) Decompression Sickness (DCS), sometimes called the "bends."

D.12.a. Arterial Gas Embolism (AGE) AGE, or air bubbles in a diver's blood, is most often found in divers who hold their breath during ascent. This typically happens following an equipment failure, or some other underwater emergency. Divers can develop AGE in very shallow waters. The onset of symptoms is often rapid and a victim's senses may become distorted. Victims may have convulsions and can quickly lose consciousness.

D.12.b. Decompression Sickness (DCS) DCS may occur as the result of coming up too quickly from a deep, prolonged dive. Rapid ascent defeats the body's ability to filter escaping gases through the lungs resulting in nitrogen gas bubbles in the blood stream. The onset of DCS is usually slow for scuba divers, taking from one to 48 hours to appear. The symptoms and signs of DCS include deep pain to the muscles and joints, choking, coughing, labored breathing, chest pains, and blotches on the skin (mottling).

NOTE Immediately transport or evacuate all patients with possible AGE or DCS to the nearest medical facility.

D.12.c. Associated Medical Problems

Major medical problems associated with the escape of air into the chest cavity or tissues may occur in asthmatics who participate in scuba activities. The symptoms may be acute shortness of breath and the signs may be similar to shock. Immediate advance medical attention is required. EMS should be activated. The victim should be transported as quickly as possible and treated for shock.

D.13. Responder Action

Most times assistance is limited to arranging or providing transportation for victims and advising interested parties of the location for the nearest recompression facility. The boat crew should treat for shock (do not elevate the legs), while arranging for evacuations.

D.14. Treating Scuba Incidents

If a diver experiences either mild or severe symptoms on surfacing:

(01) Immediately notify EMS and start transport to nearest recompression facility,
(02) Place the diver on his/her left side with head down, and provide oxygen if available,
(03) Treat for shock,
(04) Get dive profile,
(05) Secure dive gear for transport with patient.

D.15. Equipment Availability

Each District Rescue Coordination Center (RCC) and Sector Operations Center (OPCEN) has information on all recompression chambers located within its area of operations. The RCC or OPCEN will need the following medical information to arrange the correct response for a scuba incident:

(01) Depth of the victim's diving activities,
(02) Number of dives that day,
(03) Victim's overall medical condition including current level of consciousness and any previous episodes of dive-related injuries,
(04) First occurrence of victim's symptoms (i.e., during ascent, immediately after reaching the surface, etc.),
(05) Problems which may have occurred during the dive, such as a panic ascent, loss of air at depth, or equipment failure.

Section E. Treatment for Wounds, Fractures, and Burns

Introduction

In emergency situations, boat crewmembers must be able to temporarily treat severe hemorrhaging wounds, broken bones, and burn victims. As first responders, boat crewmembers must try to keep a victim calm, immobile, and alive until a higher level of care can be provided.

In this Section

This Section contains the following information:

Title	See Page
Bandages	2-23
Bleeding	2-24
Fractures (Broken Bones)	2-28
Burns	2-36

Bandages

E.1. Types of Bandages

A bandage is a strip of woven material that holds a wound, dressing, or splint in place, helping to immobilize, support, and protect an injured part of the body. Preferably, sterile bandage material in standard first aid or EMT kits should be used. Otherwise, any large piece of clean cloth can be used as a bandage, binder, or sling.

Various types of bandages come in first aid kits. They are designed to be adaptable to many different situations. For example, some are for covering large areas but may be used as slings, and others are useful as a thick pad for applying pressure over a wound to control hemorrhaging. The following table describes the different types of bandages and their uses:

Bandage Type	Use
Pressure Dressing (Emergency Trauma Dressing)	A pressure dressing is made out of absorbent gauze. It is used for injuries to the chest or abdomen. It may be held in place with other bandages e.g., cravat bandages. Do not secure so tightly that it interferes with breathing.
Gauze Bandages	Gauze is useful as a bandage for almost any part of the body. Most common uses of gauze bandages are as circular bandages and spiral bandages.
Band-Aids®	Band-Aids® or substitutes are useful for small wounds that are clean.
Triangular Bandages	Triangular bandages are useful as an emergency cover for an entire scalp, hand, foot, or other large area. Also, use these bandages as a sling for a fracture or other injury to an arm or hand. A triangular bandage can be rolled into a cravat bandage (a long, narrow strip). It is also useful as a figure eight bandage, tie for a splint, constricting band, or tourniquet. A folded cravat bandage can serve as an emergency dressing for control of bleeding, or over another dressing, to provide protection and pressure.

E.2. Bandage Application

There are two general principles for bandage application:

(01) A bandage should be snug, but not so tight as to interfere with circulation either at the time of application or later if swelling occurs,

(02) A bandage is useless if tied too loose.

E.3. Circulation

Interfering with circulation is prevented by:

(01) Leaving the person's fingertips or toes exposed when applying a splint or bandage to arms or legs,
(02) Loosening bandages immediately if a victim complains of numbness, increased pain or a tingling sensation,
(03) Watching for swelling, color changes, loss of pulse and cold or cool tips of fingers or toes.

Bleeding

E.4. Types of Bleeding

Hemorrhage, or bleeding, is the escape of blood from arteries, veins, or even capillaries because of a break in their walls. There are several different types of bleeding (**Figure 2-1**). Boat crewmembers must learn to recognize the basic types in order to know how to stop the hemorrhaging as quickly as possible. Types of bleeding include:

(01) Arterial,
(02) Venous,
(03) Capillary.

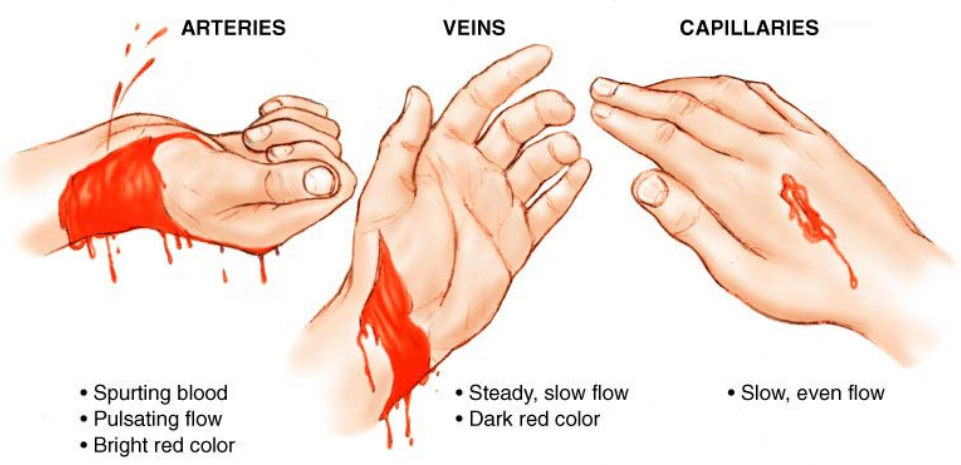


Figure 2-1
Types of Bleeding

E.5. Prevention of Bloodborne Pathogens

The risk of acquiring a blood-borne pathogen such as Hepatitis B or HIV should be evaluated. Risk may be managed by the use of appropriate PPE. Always use protective barriers, such as disposable gloves, to protect both you and the injured person. More extensive equipment may be required depending on the situation. If the crewmember is not trained or equipped to handle the situation, he/she should notify the unit or parent command so that appropriately trained and equipped personnel can be mobilized. The crewmember should not become involved if not adequately protected.

E.6. Universal Medical Precaution

In those instances where crewmembers may be exposed to bodily fluids (e.g., blood, seepage from burns, saliva, urine or feces), members should take appropriate precautions to prevent contamination by using protective gloves and goggles. Additional precautionary measures include the wearing of face masks and protective gowns or aprons. Under all circumstances, thorough washing of hands and any contaminated area should be done with soap and water. Even if gloves have been used, the crewmember should thoroughly wash hands with soap and water.

E.7. Control of Bleeding

Control of a severe hemorrhage is always urgent. With only 10 pints of blood in the human body, arterial bleeding can cause death in a short time.

WARNING

To avoid any contact with infectious fluids, including blood, always wear clean, disposable gloves when performing first aid.

E.7.a. Direct Pressure

The best method to control hemorrhaging is by applying continuous, firm, direct pressure to the wound. To apply direct pressure, use a sterile gauze or absorbent pad, applying pressure directly over the point of bleeding. If gauze or absorbent pads are not available, the palm of a gloved hand should be placed over the wound. An un-gloved hand should never be placed onto an exposed wound. Wrap a roller gauze or elastic bandage around the gauze/absorbent pad to provide continuous pressure to the wound. The bandage should be wrapped with enough pressure to control the bleeding. Additional pressure may be created by twisting the bandage directly over the wound. Caution must be used to not wrap the limb so tight that the skin beyond the bandage becomes cool to touch, bluish in color, or numb to the patient. The rescuer should be able to slip a finger under the pressure bandage. Ensure the pressure bandage is re-evaluated during transport for potential swelling of the limb (**Figure 2-2**).

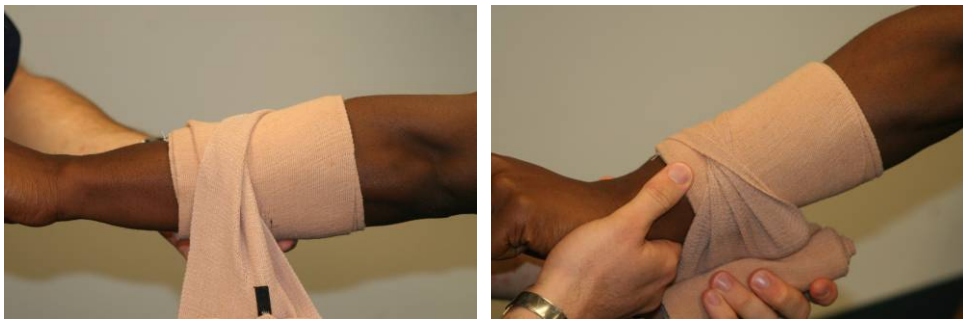


Figure 2-2
Pressure Bandage

E.7.b. Tourniquets

If bleeding persists after applying direct pressure, Apply a second pressure dressing over the first. Do not remove the first dressing. When direct pressure is insufficient for controlling bleeding, apply a tourniquet. In the past, tourniquet application was thought to cause damage to the limb and was therefore used as a last resort. Tourniquets are most effective when applied prior to the patient going into shock as a result of blood loss.

E.8. Treatment

Refer to the following procedures for treating hemorrhages:

Step	Procedure
Bandage Application	Apply a sterile bandage, if available, or clean piece of gauze or cloth to the wound. Do not remove this dressing if it becomes blood soaked; instead reinforce the dressing with a second or third bandage on top of the original one. Elevating the extremity after applying direct pressure should control most bleeding.
Pressure Bandage	A pressure bandage can replace direct hand pressure on most parts of the body. Apply the pressure bandage by placing the center of the bandage or strip of cloth directly over the pad. Hold the pad in place by circling the bandage ends around the body part, twisting over the wound and tie it off with a knot directly over the pad (**Figure 2-2**).
Elevating Injured Area	If direct pressure does not control the bleeding, then elevate the injured area (if arm or leg), but only if there is no possibility of a spine injury.
Tourniquet	If severe bleeding cannot be controlled after trying all other means and the victim is in danger of bleeding to death, use a tourniquet. Remember that a tourniquet is useful only on arms and legs. A tourniquet is a constricting band placed around an extremity, then tightened until bleeding has stopped. When a tourniquet is required, if available use tourniquets from a first aid kit. Otherwise, use any wide gauge material such as a triangular bandage and a rigid object, such as a stick or screwdriver for tightening.

E.8.a. Applying Tourniquets

Refer to the following procedures when applying a tourniquet:

Step	Procedure
1	Place the tourniquet two to three inches above the wound, but not touching the wound edges. If the wound is in a joint area or just below a joint, place the tourniquet directly above the joint.
2	Wrap the tourniquet tightly around the limb twice and secure it in place
3	Attach a note to the victim giving the location of the tourniquet and the time that it was applied. Always leave the tourniquet exposed to view. If it is not possible to attach a note, write the letter "T" on the patient's forehead with a grease pen or other suitable marker, and show the time it was applied.
4	After making the decision, and applying a tourniquet, DO NOT LOOSEN OR REMOVE IT.
5	Continue to treat for shock and obtain medical attention IMMEDIATELY.

WARNING A tourniquet should only be tight enough to stop the bleeding! Never hide a tourniquet with a splint or bandage.

Fractures (Broken Bones)

E.9. Types of Fractures

A fracture is a broken or cracked bone. For performing first aid, boat crewmembers should be aware that there are two types of fractures:

(01) Compound (open) fracture: The bone has broken and an open wound is present. The bone may protrude from the wound, leaving little doubt that there is a fracture. Use caution when applying direct pressure so as not to injure yourself,

(02) Simple (closed) fracture: No open wound is present, but the bone may be broken or cracked. Care must be taken when handling a closed fracture; careless treatment may cause an open fracture, lacerate a blood vessel, or cause other injuries.

CAUTION !

Broken bones are frequently encountered by boat crews in the course of many rescue situations. It is important to develop the ability to identify fractures immediately and treat them properly. Failure to do so can seriously complicate a fracture as well as cause other injuries.

E.10. Symptoms

Indications that a fracture has occurred may include:

(01) Pain, swelling, and discoloration at the injury site,

(02) Misalignment (deformity) and/or disability of the injured part,

(03) Victim's indication (may have heard a "crack" or "snap").

E.11. Handling a Fracture

Every suspected fracture should be treated as if it were a fracture until it is proven otherwise. The following procedures outline the proper treatment for a fracture:

Step	Procedure
1	Do not attempt to straighten broken limbs. Eliminate all unnecessary handling of the injured part. Be gentle and use great care when handling any broken limb.
2	Protect and immobilize all injured areas. Check for the possibility of more than one fracture. Do not be deceived by the absence of deformity and/or disability. (In many fracture cases, the victim may still have some ability to use the limb). Keep the broken bones and the joints immobilized above and below the injury.
3	Check pulse in the area distal (below) the fracture before and after splint application. If no pulse is present after the splint is applied, loosen the splint.
WARNING	Never hide a tourniquet with a splint or bandage.
4	Use a splint to immobilize the fracture. Selecting exactly the proper splint is less important than achieving immobilization. Splint the limb in the position found. Measure the length of the splint on the unaffected limb. Ensure the splint is long enough to immobilize the joint above and the joint below. If a joint cannot be immobilized, you can immobilze it against another body part such as securing a fractured arm to the patient's chest and a fractured leg to the other (unbroken) leg. Apply splints before moving the victim to avoid manipulation of the injured areas. Apply the splint snugly, but do not cut off circulation. Splints should be well padded. Leave tips of fingers and toes exposed and check them often for circulation adequacy.
5	Treat the injured person for shock (refer to **Section C Treatment for Shock**). Be alert for the development of shock during treatment. Shock may develop as a result of the fracture, pain from the treatment or other injuries not evident on initial assessment.

E.12. Treatment of Specific Bones

There are 206 bones in the human body. Several of these bones, if broken or injured, require very specific treatment based on the sensitive nature of their functions or their proximity to organs or arteries.

E.12.a. Spine

Any actual or suspected damage to the spine requires definitive care and careful management. Permanent disability, paralysis, or death can result from a spine injury. The following are procedures to treat spine injuries:

Step	Procedure
1	Treat all suspected spinal injuries by maintaining alignment and immobilizing the spine as quickly and completely as possible.
2	Seek further medical assistance immediately.
3	Move a patient only as a last resort.
4	Keep a patient flat and do not move the person's head.
5	When transporting a patient, immobilize on a rigid stretcher and carry the patient face up.
6	Do not splint neck and spine fractures unless properly trained.

E.12.b. Skull

The primary aim is to prevent further injury to the head. Time should not be spent figuring out whether there is a fracture or penetration to the skull. The following precautions should be utilized when dealing with head injuries:

Step	Procedure
1	Keep the patient as still as possible.
2	Keep the patient warm and do not give the person anything to drink or any pain medication.
3	Control bleeding using absorbent dressings without applying direct pressure.
4	Seek immediate medical assistance.

E.12.c. Extremities

When encountering actual or suspected fractures to any of a victim's extremities, the following general procedures must be followed:

Step	Procedure
1	Check for a pulse and sensation of touch in fingers or toes before and after a splint has been applied. If either of these is absent, it increases the likelihood of permanent damage. Make certain a splint is not applied over a bony prominence or tied too tightly. Loosen, if necessary, to re-establish feeling and pulse.
2	First responders should splint the injured part in the position found.
3	If bone ends protrude from the skin, cover the exposed bone with a sterile dressing and handle with great care when splinting. Be careful not to injure yourself.

E.12.d. Forearm

For forearm fractures, the following procedures must be performed:

Step	Procedure
1	Place two well padded splints, top and bottom, from elbow to wrist.
2	Bandage in place.
3	Hold the forearm across the chest with a sling (**Figure 2-3**) and swathe.

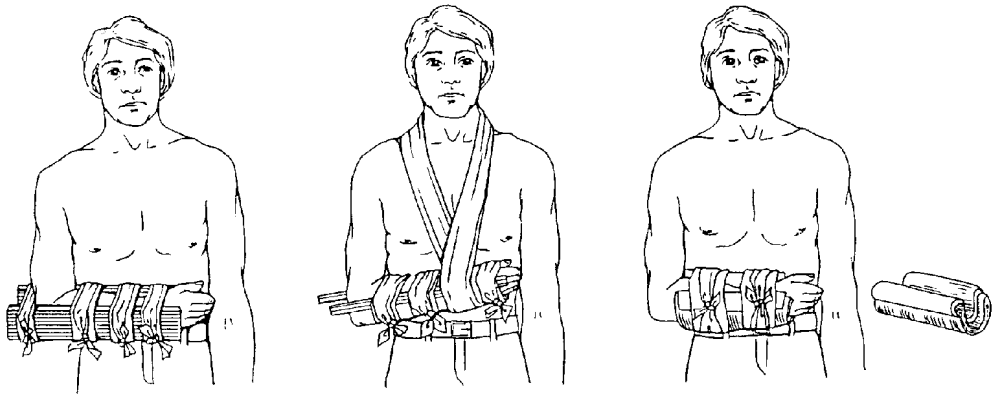


Figure 2-3
Broken Forearm

E.12.e. Upper Arm

For upper arm fractures, if equipment is available, the following procedures must be performed:

Step	Procedure
1	For fracture near the shoulder, put a towel or pad in the armpit, bandage the arm to the body, and support the forearm in a sling.
2	For fracture of the middle upper arm, use one splint on the outside of the arm, shoulder to elbow. Fasten the arm to the body and support the forearm in a sling (**Figure 2-4**).
3	For a fracture near the elbow, do not move the arm at all. Splint it as it is found (**Figure 2-5**).

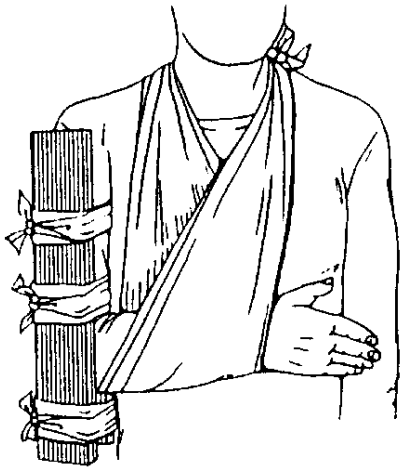


Figure 2-4
Splinting Fracture of Middle Upper Arm

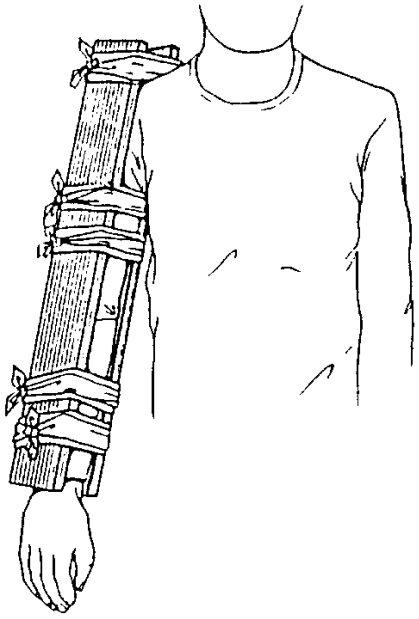


Figure 2-5
Splinting Fracture of Arm Near Elbow

E.12.f. Thigh

Due to the large artery and muscle mass, a thigh injury is often a major injury and a traction splint (if available) may be required. Medical assistance must be sought immediately. This treatment management is best performed by an EMT or person with more advanced training. If an EMT or other qualified person is unavailable, perform the following procedures:

Step	Procedure
1	Use two splints, an outside one from armpit to foot and an inside one from crotch to foot.
2	Fasten the splints around the ankle, over the knee, below the hip, around the pelvis, and below the armpit.
3	Tie both legs together (**Figure 2-6**). Do not move a patient until this has been done This injury is often associated with major trauma, and bleeding may occur if the thigh bone severs the adjacent femoral artery. The patient should be monitored closely for signs of shock and the leg should not be manipulated. Check pulse in feet.

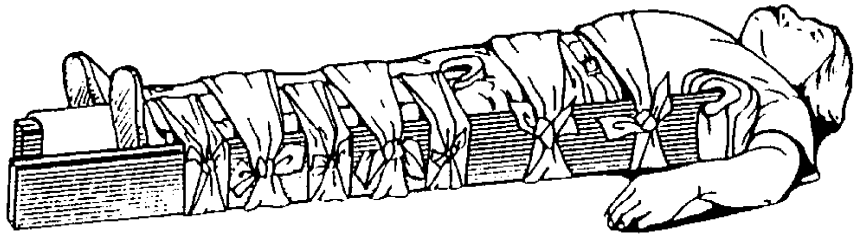


Figure 2-6
Broken Thigh

E.12.g. Lower Leg

To treat a broken lower leg, perform the following procedures:

Step	Procedure
1	Use three splints (if available) one on each side and one underneath.
2	Always pad the splints well, especially under the knee and at the ankle bones.
3	Use a pillow under the leg with the edges brought around in front and pinned, and then add two side splints (**Figure 2-7**).

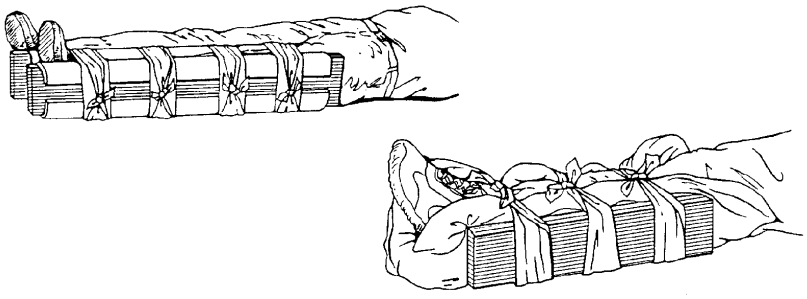


Figure 2-7
Broken Lower Leg

E.12.h. Collarbone

Use the following procedures to immobilize the collar bone:

Step	Procedure
1	On the injured side, place the forearm across the chest, palm turned in, thumb up, with hand four inches above the elbow.
2	Support the arm in this position with a sling.
3	Fasten the arm to the body with several turns of bandages around the body and over the hand to keep the arm close against the body (**Figure 2-8**).

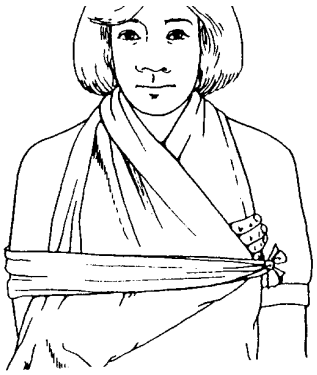


Figure 2-8
Broken Collarbone

E.12.i. Rib

A broken rib can be very painful and very dangerous because of the opportunity for a broken rib to puncture a lung. A patient coughing up frothy bright red blood may have a punctured lung. Immediate assistance should be sought and EMS should be activated.

If oxygen is available and the crewmember is properly trained to do so, he/she may administer oxygen with the patient at rest in a sitting position. This eases the effort required to breathe. Patients with known or suspected fractured ribs should be given a high priority for transport to a medical facility.

E.12.j. Nose

If an injury to the nose occurs, utilize the following procedures:

Step	Procedure
1	Stop the bleeding.
2	If conscious, have the patient sit and lean forward applying gentle pressure to the sides of the nose.
3	Apply a cold compress or an ice bag over the nose to ease pain, reduce swelling, and assist in stopping the bleeding.
4	Place unconscious victim on his or her side to keep airway open.

E.12.k. Jaw

If an injury to the jaw area interferes with a victim's breathing, have patient lean forward to assist with draining of blood/saliva rather than lying patient on their back. If patient is unable to sit, then they should be placed in the recovery position on their side.

E.12.l. Pelvis

A patient with a pelvis injury should be treated for shock, but should not be moved unless absolutely necessary. When moving a patient, the person should be treated the same as a victim with a spinal injury.

(01) Bandage the legs together at the ankles and knees and place a pillow at each hip and secure them,

(02) Fasten the patient securely to the stretcher.

A pelvis injury is often associated with major trauma and may involve bleeding that is undetectable. The patient should be closely monitored for signs of shock which may be caused by heavy internal bleeding.

WARNING Never "log-roll" a victim with a pelvic fracture. If possible, safely perform a vertical lift instead.

Burns

E.13. Causes of Burns

Causes of burns include:

(01) Thermal,
(02) Chemical,
(03) Sunburn,
(04) Electric shock,
(05) Radiation.

NOTE Burns, regardless of the cause, may cause a person to go into shock.

E.14. Burn Classification

Burns can range from minor irritations to life threatening and disabling. Proper first aid, administered quickly, can minimize damage resulting from burns and can make the difference between life and death in serious situations. For these reasons, it is very important that boat crewmembers be able to quickly determine the type and seriousness of burns in order to treat them quickly and properly. In general, the size of the burn is more important than the degree of the burn. Burns are classified by depth or degree of skin damage. The following are the three general classifications of burns:

(01) First-degree or Superficial,
(02) Second-degree or Partial Thickness,
(03) Third-degree or Full Thickness.

E.14.a. First-Degree

First-degree or superficial burns are the mildest form of burns. These burns involve only the outer layer of skin and produce redness, increased warmth, tenderness, and mild pain.

E.14.b. Second-Degree

Second-degree or partial-thickness burns extend through the outer layers of the skin. These burns involve the inner layers of the skin, but not enough to prevent rapid regeneration. They may produce blisters and are characterized by severe pain, redness, and warmth.

E.14.c. Third-Degree

Third-degree or full-thickness burns are those that penetrate the full thickness of the skin, destroying both the outer and inner layers. Severe pain, characteristic of second-degree burns, may be absent because nerve endings have been destroyed. Color may range from white and lifeless to black (charred). Healing requires many months, and usually results in scarring of the skin tissue. Skin grafts are generally required to achieve full healing.

NOTE

Burns of the respiratory tract are very serious and may be diagnosed by singed eyebrows, eyelashes, or nostril hairs, hoarseness, sore throat, or coughing of blood.

E.14.d. Total Body Surface Area

The greater percentage of total body surface area (TBSA) involved, the greater the risk of developing systemic complications. Risk factors for severe systemic complications, shock and/or mortality include all the following:

(01) Burns of > 40% of TBSA,
(02) Age > 60 yr or < 2 yr,
(03) Presence of simultaneous major trauma or smoke inhalation.

The most common systemic complications are a decrease in blood circulation and infection.

E.14.e. Determing Burn Percentage

In order to determine roughly what percentage of a victim's TBSA has suffered some type of damage (burns, etc.), the following estimates for adult patients should be used:

(01) Chest = 18%,
(02) Back =18%,
(03) Each arm = 9%,
(04) Each leg = 18%,
(05) Head = 9%,
(06) Genitals = 1%.

General first aid procedures for all burns include the following:

(01) Ensure the scene is safe to provide care,
(02) Eliminate the source of the burn. Extinguish and remove smoldering clothing. Do not remove charred clothing that may be sticking to the burn,
(03) Remove any jewelry,
(04) For burns resulting from electrical shock, ensure the patient is no longer receiving electrical shock,
(05) Treat to prevent or reduce shock,
(06) Try to prevent infection,
(07) Do not apply any type of ointment on burns,
(08) Apply dry sterile dressing.

E.15. Burn First Aid

In addition to the above general steps, the following are first aid procedures for burns that apply specifically to particular classes of burns:

Burn Type	First Aid Procedure
First-Degree	(01) Immerse in cool water until pain is relieved. (02) For chemical burns, first brush off any dry powder and remove any contaminated clothing. Flush chemical burns for at least 20 minutes unless chemical is known to react with water. (03) Cover loosely with clean or sterile dressing.
Second-Degree	(04) Use the same treatment as for first-degree burns. (05) Do not break open any blisters. (06) Cover with a loose, dry, sterile, non-adhesive dressing. (07) For deep second-degree burns, follow the procedures for third-degree burns.
Third-Degree	(08) Loosely cover the burn to reduce exposure to air. (09) Cool the burn. (10) Separate fingers or toes with dry, sterile, non-adhesive dressings. (11) Do not remove clothing unless smoldering. (12) Treat for shock even if not apparent. (13) Always obtain medical care. (14) Monitor the patient's airway. (15) Assess vital signs every 5 minutes. (16) Give nothing to eat or drink. (17) Do not place ice on the burn. (18) Do not apply ointments to the burn. (19) Burns of the respiratory tract are always a medical emergency.

E.16. Chemical Burns

Chemical burns of the skin or eyes produce the same type of burn as flash fires, flames, steam, or hot liquids. The following procedures should be performed:

Step	Procedure
1	Wash the chemical away completely, as quickly as possible, using large quantities of water.
2	Continue flushing the burn for at least 20 minutes.
3	When the burn involves an eye, flush the eye with water for up to 20 minutes.
4	Cover both eyes with a clean, dry, protective dressing and seek medical attention as quickly as possible.
5	Give first aid for shock.
6	If the chemical is a powder, brush off as much as possible before flushing with water.

Section F. Cold-Related Factors

Introduction

The purpose of this Section is to briefly describe the precautions to take while operating in cold weather. Cold rain, snow, ice storms, and high winds can develop with very little warning in certain parts of the country. Preparation before encountering these kinds of conditions and understanding the effects of cold on personnel safety is vital.

In this Section

This Section contains the following information:

Title	See Page
Effects of Cold Weather	2-41
Hypothermia	2-42
Frostbite	2-46
Layering Clothing	2-47

Effects of Cold Weather

F.1. Operating in a Cold Climate

Operating in a cold climate presents the challenge of keeping warm while effectively carrying out the mission. As the temperature drops or clothing becomes wet, more insulation is required to keep the body from losing its heat.

WARNING

Excessive loss of body heat, which can occur even in mild weather conditions, may lead to hypothermia.

F.2. Wind

Wind affects body temperature. Those parts of the body exposed directly to the wind will lose heat quickly, a condition commonly referred to as “wind chill.” On bare skin, wind will significantly reduce skin temperature, through evaporation, to below the actual air temperature.

WARNING

Prolonged exposure to the wind may lead to hypothermia and/or frostbite.

F.3. Crew Fatigue

The combination of rough seas, cold temperatures, and wet conditions can quickly cause the crew to become less effective. Crew fatigue will occur more quickly when these conditions are present. Many accidents occur when cold induced fatigue sets in because the mind loses attentiveness and physical coordination diminishes. Even a crew that is moderately cold and damp will exhibit a decrease in reaction time which is also a symptom of the onset of hypothermia.

Hypothermia

F.4. Loss of Body Heat

Hypothermia is a lowering of a person's core temperature. It occurs when a person suffers a loss of body heat. General body hypothermia is the leading cause of death among shipwrecked crews and other disasters at sea. If not recognized and treated promptly, hypothermia can rapidly turn survivors into fatalities. Survivors in critical hypothermia conditions may suffer a fatal loss of body temperature from physical exertion, or as a result of any delay in taking immediate and positive measures to restore body heat. Struggling survivors, trying to aid in their own rescue, may drive their body temperature down to the point where unconsciousness and/or death results. Survivors removed from the water and left untreated may suffer further critical loss in body temperature, bringing on death after being rescued. Survivors in "warm" water can also suffer from hypothermia if exposed for long enough periods of time. Also, cold air temperatures can bring on hypothermia if adequate protective clothing is not worn.

F.5. Survivability

Survival times in water vary considerably. Survival depends on the type of clothing worn, the amount of physical exertion, the blood alcohol levels, and other factors. Some survivors, when taken aboard during a SAR case, may appear to be under the influence of drugs or alcohol. A person moderately hypothermic may manifest symptoms of an intoxicated person.

F.6. Signs

Signs of hypothermia include:

(01) Slow, weak pulse,
(02) Unconsciousness,
(03) Cold pale skin skin,
(04) May simulate or accompany shock,
(08) Shivering,
(09) Clouded mental capacity (may seem disoriented),
(10) Slow and labored breathing,
(11) Dilated pupils,
(12) Slurred speech (may seem intoxicated),
(13) Loss of coordination.

NOTE The leading cause of death in cold water maritime accidents is hypothermia.

F.7. Rescue Precautions

When it is suspected a survivor has critical hypothermia, rescue attempts should be made that avoid rough handling and minimize the amount of exertion by a victim. This can be accomplished by sending a surface swimmer into the water to assist the survivor into the rescue craft. Care should be taken to handle the victim gently. Excessive movement may cause heart beat irregularities which can be fatal. During the rescue and afterwards, the patient should be kept calm and quiet.

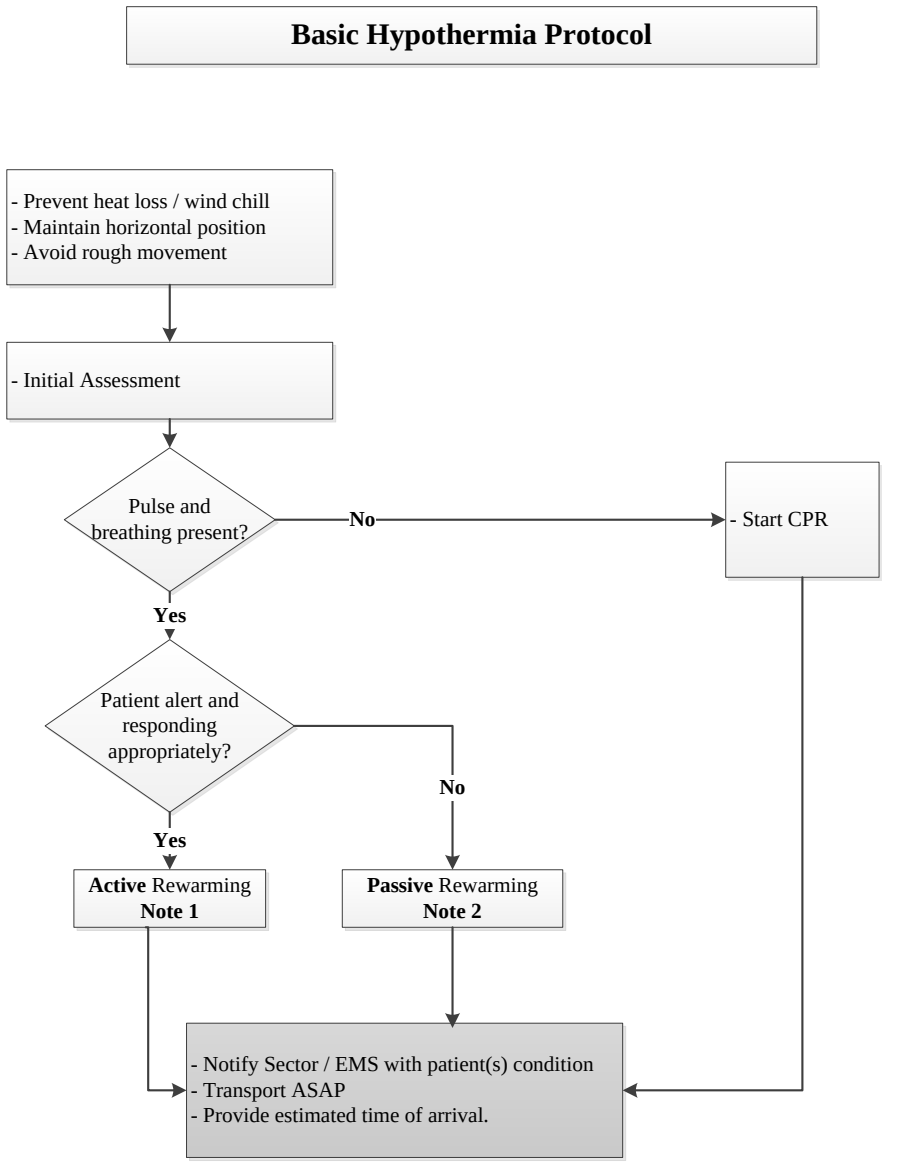
CAUTION!

Do not allow a person to perform any physical activity other than what is absolutely necessary. Exertion can use up large amounts of body heat which is necessary to raise the survivor's internal body temperature.

F.8. Basic Treatment

Treatment for hypothermia will depend on both the condition of the patient and treatment facilities available. Survivors who are rational and capable of recounting their experiences, should be insulated by wrapping in blankets and/or move to a warm environment to rest.

An **alert** patient who is shivering, and **who is not at risk for aspiration**, should receive high-carbohydrate liquids and food. Liquids and food should be warmed but should not be hot enough to cause burns. Do not give cold food items, caffeine and alcohol. If the patient is believed to be hypothermic, follow the protocol for hypothermia (**Figure 2-9**)**.**



Note 1. Active methods include: radiant heat source.

Note 2. Passive methods include: blankets or dry clothing.

Figure 2-9
Basic Hypothermia Protocol

F.9. Advanced Treatment

In more serious cases, where victims are semiconscious or near death, a medical facility should be contacted as soon as possible for detailed instructions for proper care and handling. While awaiting medical instructions, immediately administer first aid to survivors using the following procedures:

Step	Procedure
1	After recovering a victim from the cold, avoid rough handling of the victim as this can cause further harm. Check for the presence of breathing and pulse. If the victim is not breathing and has no heartbeat, begin CPR immediately. If the victim is breathing, and has a pulse, gently transfer the person to a warm environment. Be sure to check the person's breathing and pulse frequently. Always remain prepared to immediately begin CPR if breathing or pulse stop.
2	Lay an unconsciousness or semiconscious victim face up. If vomiting occurs, turn the patient's head to one side. Observe respiration closely and remove any secretions from the victim's nose and mouth.
3	Remove the victim's clothes with minimum movement of the body. Cut the clothes away with scissors or a knife if necessary. If a patient cannot be moved to a compartment to be warmed with blankets, dry clothing, or other warming methods, then DO NOT remove wet clothing. Under these circumstances, the wet clothing is better than no clothing.
CAUTION !	Semiconscious or unconscious persons should not be given anything to eat or drink.
4	Do not give anything orally, especially alcohol.
5	Insulate a victim from further heat loss by wrapping the person in a blanket. Do not attempt to aggressively rewarm an unconscious or semiconscious victim, as rapid warming can cause dangerous complications. Do not rub frozen body areas. A victim will be very sensitive to rough handling. The primary objective after a person has been removed from the water is to prevent the person from getting colder.
6	If properly trained and equipped, administer warm, humidified oxygen by face mask. The oxygen will not only assist victims if they are having difficulty breathing or have a low respiratory rate, it will also provide rewarming of the internal body core.

Step	Procedure
WARNING	Hypothermia patients are very prone to burns. Hot packs, heating pads, and hot water bottles may cause third degree burns and must be administered with extreme care.
7	When there will be a delay getting a victim to a hospital, begin gentle rewarming techniques. Rewarming techniques include: (01) Wrapping the victim in a blanket. Protect from wind, water, cold surfaces and further heat loss. (02) Applying your body warmth by direct body-to-body contact with a victim. A blanket should be wrapped around you and the victim to preserve the heat.
8	Evacuate a victim to a medical facility soon after or during emergency treatment. A medical phone patch can be set up through the Coast Guard Station if needed. A helicopter with an EMT can be sent to provide help and to evacuate a victim.

Frostbite

F.10. Development Factors

Frostbite is the development of ice crystals within body tissues. Frostbite is most likely to develop in air temperatures less than 20° F (-6.6° C). The following factors contribute to the development of frostbite:

(01) Cold stressors (wind, air temperature, and exposure to water),
(02) Any restriction of blood-flow,
(03) Lack of appropriate protection,
(04) Skin exposure.

F.11. Symptoms

A frostbite victim will complain of painful cold and numbness in the affected area. Waxy white or yellow-white, hard, cold, and insensitive areas will develop. As the area begins to thaw, it will be extremely painful and swelling (reddish-purple) or blisters may appear. Areas prone to frostbite include all extremities where the blood has traveled farthest from the heart, such as the hands, feet, face, and ear lobes. A patient suffering from frostbite should also be treated for hypothermia.

F.12. Prevention Cold weather clothing and equipment are essential to prevent cold-related injuries and fatigue. Such items include: cold weather boots, thermal socks, watch caps, gloves, and thermal underwear (moisture wicking).

WARNING Any person who has had frostbite previously is at an increased risk for a cold exposure injury in that same area of the body.

Layering Clothing

F.13. First Layer - Wicking Staying dry is an essential factor to maintaining body temperature. Clothing worn next to the skin must carry or "wick" moisture away from the body. Cotton clothing can pose particular problems. They absorb and retain moisture, which will rob body heat through evaporation. Wool has good insulating properties even when wet, but it is less than ideal because it stays wet. Modern synthetic wicking fibers such as polypropylene do not retain moisture. They will actually draw moisture from the skin and transport it to an absorbent outer layer. This clothing works well by itself, or it can be combined with a second layer for extreme cold.

F.14. Second Layer - Insulation The insulating effect of a fabric is related to how much air it can trap. This is why a loose-knit or fuzzy material is better than one that is tightly knit. It is also why two thin layers of a given material are better than one thick one. The second layer traps air, which retains body heat, while absorbing excess moisture from the first layer. Wool or cotton thermals are an acceptable second layer if worn over a wicking layer, but a number of synthetic fleece or pile garments do a much better job. An example of this is the fleece coverall.

F.15. Third Layer - Moisture Barrier The outer layer should stop wind and water, so the inner layers can work as designed. Choices include the anti-exposure coverall, dry suit, or rain gear. The dry suits and rain gear have no insulating properties and will require extra insulation for cold weather. Also, as most dry suits do not "breathe," an absorbent second layer is needed so that perspiration has a place to go.

F.16. Extremities Most heat loss occurs through the extremities, especially the head. It is particularly important to cover these areas well. It is still important to layer properly, but thinner, or all-in-one materials must be used to reduce bulk. For the head, a wool cap may work, but a heavy wicking hood or cap worn alone or under a wool cap will keep you drier and warmer. A rain hat or hood should be considered for wet weather. Gloves should be waterproof, and a wicking liner glove will work better than wool. High top rubber boots are the only option for wet weather. A wicking liner sock under a wool, cotton, or fleece outer sock will provide the best warmth. Insoles should be non-absorbent. A perforated foam insole also works well.

Section G. Sun and Heat-Related Factors

Introduction

Crewmembers must be aware of the dangers of too much exposure to the sun and take preventive measures to guard against a decrease in performance. Intense sunlight and extreme heat can increase crew fatigue and reduce effectiveness. This Section discusses the various sun and heat-related factors that crewmembers may encounter during their activities.

In this Section

This Section contains the following information:

Title	See Page
Sunburn	2-48
Dehydration	2-49
Heat Rash (Prickly Heat)	2-51
Heat Cramps	2-51
Heat Exhaustion	2-52
Heat Stroke	2-53
Susceptibility to Heat Problems	2-53

Sunburn

G.1. Description

Continuous exposure to the sun can cause sunburn and other complications such as heat stroke, dehydration, etc. Unprotected exposed skin will suffer from premature aging and an increased chance of skin cancer.

G.2. Symptoms

Sunburn appears as redness, swelling, or blistering of the skin. Other effects of overexposure to the sun are fever, gastrointestinal symptoms, discomfort, and pigment changes in the skin.

G.3. Prevention

If exposed to the sun for prolonged periods of time, crewmembers must take precautions. Staying in the shade when possible is a start. However, just getting out of direct sunlight is not always enough since sun can be just as harmful when reflected off a bright surface, such as sand or water. Sunscreen lotion with a sun protection factor (SPF) of 15 or higher should be used. Protective clothing such as a hat with a brim and sunglasses with ultraviolet protection for eyes should be worn.

G.4. Treatment

Most sunburns do not appear fully until exposed to the sun for several hours. Treatment consists of applying cool wet towels to the affected area. Cooling the skin temperature is very important. Keeping the skin moist but being wary of what product is applied is also essential. Many lotions contain perfumes, alcohol, or wax that will only aggravate the burn. Several types of first aid sprays give fast but short-lived relief.

Dehydration

G.5. Description

An adequate fluid intake is essential to remain hydrated while underway. Fluids are lost from the body in several ways. The most obvious loss is through the kidneys. The less obvious loss of body fluid occurs through perspiration from the skin and respiration through the lungs. As a result, an average, healthy adult requires two or three liters of fluid a day to replace these losses. Extremely warm weather significantly increases the loss of fluids. Staying away from liquids such as tea, alcohol, coffee, and soft drinks is advisable as these liquids speed up fluid loss.

One vital element of body fluids that must be maintained is electrolytes. "Electrolyte" is a medical/scientific term for salts, specifically ions. Electrolytes are important because the body uses them to maintain voltage across cell membranes and to carry electrical impulses for moving the muscles. The body loses electrolytes mostly through perspiration. In most cases, a normal diet and drinking plenty of fluids will maintain an adequate electrolyte level.

Overhydrating with water without adequate salt intake may cause excessively low sodium levels in the blood (hyponatremia). This can result in symptoms of nausea, vomiting, headache, confusion and fatigue and can be confused with heat exhaustion. Hyponatremia is potentially life-threatening. As a guideline fluid intake should not exceed 1 ¼ quarts of water per hour or 12 quarts daily.

WARNING

Do not use salt tablets unless prescribed by a physician. The use of salt tablets does not improve well-being despite the amount of perspiration or salt/electrolyte loss.

G.6. Symptoms

Healthy adults must satisfy their water and electrolyte requirements. When water and electrolytes are not replaced, the body experiences dehydration. Drinking alcohol and caffeine increases dehydration. At first there is thirst and general discomfort, followed by an inclination to slow physical movement, and a loss of appetite. As more water is lost, an individual becomes sleepy and experiences a rise in body temperature. By the time the body loses 5% of body weight in fluids, the individual begins to feel nauseated. When 6 to 10% of body fluids are lost, symptoms increase in this order:

(01) Dry mouth,
(02) Dizziness or lightheadedness that does not allow a person to stand or walk normally,
(03) Fainting,
(04) Headache,
(05) Rapid heart rate,
(06) Confusion.

G.7. Prevention

Drinking fresh clean water is the best and easiest method to replace fluid loss and prevent dehydration. Almost all fluids are suitable including fruit juices, soups, and water. Crewmembers should drink plenty of fluids throughout the day, especially in warm, dry climates. Taking along an ample supply of water is a must during prolonged periods away from a water source.

WARNING

Never force fluid by mouth to a person who is unconscious or semiconscious due to risk of choking.

G.8. Treatment

The signs of dehydration can be subtle and therefore, crewmembers should be particularly watchful of each other under extreme conditions of sun and heat. The crew should be encouraged to drink fluids throughout the mission. Rotating crews between tasks where they are exposed to the sun and shade will help prevent dehydration. If a crewmember becomes dehydrated, the person should be immediately removed from further exposure to heat and/or sun and should receive prompt medical attention. Mild dehydration cases will become serious if the level of activity and environmental conditions do not change.

Heat Rash (Prickly Heat)

G.9. Description Heat rash is prevalent among those living and working in warm, humid climates or in hot spaces ashore or aboard boats. It may occur in cool weather if a person overdresses.

G.10. Symptoms Heat rash develops when sweat ducts in the skin become blocked. This causes:

(01) Breakdown of the body's ability to perspire,

(02) Decreased evaporative cooling of the skin,

Heat rash may be very itchy and may interfere with sleep, resulting in decreased efficiency and increased cumulative fatigue, making the individual susceptible to more serious heat disorders. Heat rash also accelerates the onset of heat stroke. Symptoms of heat rash are:

(03) Small red bumps mainly on the neck, shoulders and chest,

(04) Skin irritation (prickling),

(05) Frequent, severe itching.

G.11. Prevention Coxswains and crewmembers must be aware of negative effects brought on by heat rash, and be alert for symptoms when operating in a hot environment. Rotating crews between heat-related tasks and those jobs in a cooler environment will help prevent heat rash from occurring.

G.12. Treatment If heat rash occurs, the crewmember should be immediately removed from further exposure to excessive heat. Positive action should be taken to prevent the onset of more serious disorders. The heat rash should be washed with a gentle soap , rinsed, and patted dry with a towel. Clothing should be worn that allows the skin to breathe. A cool wet towel may be applied for 20 minutes several times per day.

Heat Cramps

G.13. Description Heat cramps are painful contractions caused by excessive salt and water depletion. Heat cramps may occur as an isolated occurrence with normal body temperature or during heat exhaustion. Recently stressed muscles are prone to heat cramps, particularly those muscles in the extremities and abdomen.

G.14. Symptoms Heat cramps affect the muscles of the extremities and abdominal wall. Pain may be severe. Body temperature may be normal or elevated. The patient will have moist, cool skin and heavy sweating.

G.15. Prevention The guidelines discussed previously for other heat-related illnesses should be followed.

G.16. Treatment The treatment for heat cramps is removal from the hot environment and drinking cool fluids which afford both relief and continued protection. A diluted "sports" drink may speed up recovery. Dilute the "sports" drink by mixing with half water. Gentle stretching and gentle massage of the affected muscle groups may help. Re-exposure to heat should be avoided for at least 12 hours. Prompt medical assistance is recommended for severe or persistent conditions.

Heat Exhaustion

G.17. Description Heat exhaustion typically occurs when people exercise heavily or work in a warm, humid environment where body fluids are lost through heavy sweating. Fluid loss can result in a decrease of blood-flow to vital organs. In heat exhaustion, sweat does not evaporate as it should, possibly because of high humidity or too many layers of clothing. As a result, the body is not cooled effectively.

G.18. Symptoms The signs and symptoms of heat exhaustion include: dizziness, headache, nausea, weakness, clumsy/unsteady gait and muscle cramps. An individual that collapses in the heat and continues to perspire freely almost surely has heat exhaustion. The presence of sweating usually rules out heat stroke.

G.19. Prevention The guidelines discussed previously for other heat-related illnesses should be followed.

G.20. Treatment First aid treatment should be provided immediately followed by rapid removal (in a litter, if possible) of the patient to a location that can provide proper medical care.

Heat Stroke

G.21. Description Heat stroke is a major medical emergency and results from the complete breakdown of the body's sweating and heat regulatory mechanisms. Heat stroke or "sun stroke" is caused by operating in bright sun or working in a hot environment, such as an engine compartment. The onset of heat stroke is very rapid.

G.22. Symptoms The major symptoms of heat stroke are:

(01) Red skin, hot and dry to the touch (cessation of sweating),
(02) Characteristic body temperature above 105° F (40.5° C),
(03) Headache,
(04) Weak and rapid pulse,
(05) Confusion, violence, lack of coordination, delirium, and/or unconsciousness,
(06) Brain damage (if immediate medical treatment is not given).

G.23. Prevention The guidelines discussed previously for other heat-related illnesses should be followed.

WARNING No matter which type of operation or assigned mission is being conducted, all incidents of heat stroke must be considered as medical emergencies.

G.24. Treatment Heat stroke is the most serious of all heat disorders and is an immediate threat to life. There is a high mortality rate associated with heat stroke. It is important to remember that heat exhaustion is the result of overloaded heat balance mechanisms that are still functioning. Heat stroke strikes the victim when the thermo-regulatory mechanisms are not functioning, and the main avenue of heat loss, evaporation of sweat, is blocked. The patient must be treated immediately, or death may occur. It is best to carefully remove the victim to a cooler environment and seek medical assistance.

Susceptibility to Heat Problems

G.25. Description Personnel who are not accustomed to strenuous physical activity in hot and humid environments are particularly susceptible to heat injuries. Excess body weight contributes to this susceptibility.

G.26. Clothing and Equipment

Impermeable clothing does not "breath" and thus greatly increases an individual's susceptibility to heat-related illnesses. Clothing acts as a barrier that prevents evaporative cooling. Many synthetic fabrics reduce the absorption and dispersal of sweat needed to achieve optimum heat loss by evaporation.

Clothing and equipment should be worn so that there is free circulation of air between the uniform and the body surface. Wearing shirt collars, shirt cuffs, and trouser bottoms open will aid in ventilation. However, this practice may not be permissible in those areas where loose fitting or open style clothing would present a safety hazard (e.g., around machinery with moving parts).

In full sunlight or a high radiant heat source (e.g., machinery spaces), keeping the body covered with permeable clothing reduces the radiant heat load upon the body. When not working in these areas, removal of the outer layer of clothing will help reduce body temperature. Impermeable clothing must be avoided. If impermeable clothing must be worn, precautions should be taken to avoid the rapid buildup of body heat. Heat illnesses may be manifested in minutes if impermeable clothing is worn.

G.27. Fever

Febrile illnesses (fever) increase the chance of rapid heat buildup within the body. The presence of fever before heat stress exposure reduces the allowable exposure times.

G.28. Fatigue

Cumulative fatigue may develop slowly. Failure to recognize this slow development increases an individual's susceptibility to heat-related problems.

G.29. Prior Heat Illnesses

Prior heat illnesses lead to heat illnesses of greater severity with each incidence. There are two major preventive measures:

(01) Water,

(02) Salt.

G.29.a. Water

The body needs water only in quantities sufficient to prevent dehydration and electrolyte imbalances that result from losses in sweat, urine, etc. Under conditions of profuse sweating, each person will require one pint (0.5 liters) or more of fluid intake per hour. Water should be taken in small quantities at frequent intervals, such as every 20 or 30 minutes.

G.29.b. Salt

The average diet provides from 15 - 20 grams of salt daily. This amount of salt is adequate for the prevention of most heat-related illnesses.

Section H. Miscellaneous Emergencies

Introduction

Boat crewmembers will face a variety of emergencies that will require performing first aid. This Section discusses miscellaneous emergencies that boat crewmembers will encounter aboard their own vessel or when dealing with marine casualties.

In this Section

This Section contains the following information:

Title	See Page
Hazardous Gases and Vapors	2-55
Poisoning by Mouth	2-58
Eye Injuries	2-59
Fish Bites and Stings	2-61
Near-Drowning	2-64

Hazardous Gases and Vapors

H.1. Introduction

Crewmembers are constantly at risk of injury or death from exposure to hazardous gases and vapors both on and off duty. The most common hazardous gas encountered during boat operations is Carbon Monoxide gas (CO). CO is a colorless and odorless gas which is lighter than air.

H.2. Conditions Where CO May Be Present

The following conditions are associated with CO poisoning:

(01) Fuel-burning devices,
(02) Enclosed areas,
(03) Underway,
(04) Fires.

H.2.a Fuel Burning Devices

Operating any of the following fuel-burning devices produces CO gas:

(01) Gasoline or diesel engines,
(02) Portable dewatering pumps,
(03) Propane or alcohol stoves,
(04) Acetylene torches,
(05) Kerosene heaters.

H.2.b. Enclosed Areas

Personnel can be quickly affected by CO gas in areas such as closed cockpits or unventilated spaces below decks and under the following conditions:

(01) Sleeping in a closed cabin while using certain types of catalytic and/or flame producing heaters,

(02) Working in an engine compartment with the engines operating,

(03) Working a defective exhaust system which allows fumes to accumulate in a confined space.

NOTE

When located in a compartment that may be affected by lethal fumes, breathable air may be found near the deck. Crouch or crawl on the deck to reach an exit.

H.2.c. Underway

The boat does not need to be stationary for a problem with CO gas to occur. For example, a following wind can circulate exhaust gases throughout the cockpit of a slow-moving boat.

The construction of some cockpits or cabins can cause eddies from a wind current which draw fumes back aboard.

H.3. Fires

Breathing the by-products of a fire is another source of dangerous fumes. Even a recently extinguished fire is still dangerous. Fires can also create other highly lethal fumes such as cyanide gases. This happens when different types of plastics, upholstery, cushions, or electronics insulation burn.

H.4. Symptoms

Symptoms of CO poisoning can include one or more of the following:

(01) Headache,
(02) Weakness,
(03) Dizziness,
(04) Nausea or vomiting,
(05) Blurred vision,
(06) Loss of consciousness,
(07) Cherry red skin color,

Symptoms of cyanide gas exposure include:

(08) Headache,
(09) Weakness,
(10) Dizziness,
(11) Confusion,
(12) Shortness of breath,
(13) Unconsciousness,
(14) Seizure,
(15) Eye irritation,
(16) Pink or red skin color.

H.5. Prevention

Crewmembers should always ensure adequate circulation of fresh air throughout the vessel. Minimizing the effect of exhaust fumes on the vessel is key and may be as simple as:

(01) Making a minor course change,
(02) Increasing speed,
(03) Opening a door, window, etc.

H.6. Response to Victims

The first senses affected by poisonous gases are those that control a person's judgment and decision-making ability. Once dangerous fumes affect a person, they may not be able to help themselves. The following responses should be conducted as appropriate:

(01) If CO or any other type of poisoning is suspected, remove the conscious victim to fresh air and get medical help immediately. Administer oxygen (if available and trained to do so),

(02) If the victim is unconscious, do not try to assist them alone. Needless casualties occur from people trying to help someone overcome by lethal fumes, only to become victims themselves. See if the victim is responsive by calling out to them. If there is no response, immediately call for assistance and wait in a clean atmosphere until help arrives.

H.7. Additional Threats

Since boat crews are often required to respond to those needing assistance or to act as the eyes and ears of local commands they are frequently in situations that require proximity to incidents in early stages. For example, while responding to the scene of a collision between two commercial barges, there may be hazardous chemicals, gases, vapors or fumes involved that might be Immediately Dangerous to Life and Health (IDLH). The safest place for the boat and crew is often upwind and up current. Publications like the North American Emergency Response Guidebook (NAERG) provide first responders with potential hazards and recommendations for safe distances and appropriate protections.

Poisoning by Mouth

H.8. Description

When poisoning occurs, it is vital that proper first aid be given immediately.

H.9. Seeking Advice

The product container will often include specific treatment instructions. If poisoning has occurred, medical assistance should be sought immediately. The boat crew should contact its unit, provide information about the substance taken, an estimate of the quantity taken, and have the unit immediately contact the local poison control center. The container for the substance and any samples of vomit should be taken with the victim when transporting to a medical facility.

H.10. Medical Assistance Not Available

If medical advice is not immediately available and the patient is conscious, an attempt should be made to determine if the poison is a strong acid, alkali, or petroleum product. No attempt should be made to induce vomiting.

H.11. Treatment

Closely observe the basics for shock treatment during transport described in **Section C** of this Chapter. Treatment should also be based on information provided by the local poison control center.

Eye Injuries

H.12. Description

Eye injuries are potentially serious, and may be permanent, unless handled promptly and properly. Eyes should be moist. Any dressing applied directly to an open or partially open eye should also be moistened with clean water to prevent excessive drying.

Eye movement is conjugal, that is if one eye moves, the other also moves in the same manner. When dealing with a penetrating injury to an eye, or a foreign object in an eye, the objective is to limit eye movement. Because of conjugal movement, this is best accomplished by covering both eyes. In most cases, a patient with an eye injury is transported sitting up.

H.13. Blindness

Patients who have experienced a blinding injury become totally dependent upon their rescuer. These patients should never be left alone. Constant contact and continuous conversation with them should be maintained to reduce anxiety.

H.14. Types of Eye Injuries

There are many injuries that may occur to a victim's eyes. Any eye injury is normally the cause of great anxiety for a victim, many times causing more concern than more serious injuries to other parts of the body. As a boat crewmember, this should be kept in mind while rescuing or treating victims with eye injuries.

H.15. Symptoms and Treatments

The following table describes the symptoms and appropriate treatments for the various eye injuries:

Eye Injury	Symptom	Treatment
Blunt Eye Trauma	Blows to a victim's head and eye area may result in a fracture to the orbit (the bony socket encircling the eye), entrapping vessels and nerves to the eye.	Managing such injuries requires covering both eyes with a dry dressing. This is important since movement by an uninjured eye is mimicked by the injured eye. Refer the patient to medical care for follow-up. Since this injury may involve a head injury, closely observe the patient for signs of further damage.
Penetrating Objects and Foreign Bodies	Common objects include fish hooks, wood splinters, or pieces of glass.	Any object that has penetrated the eye must not be removed as first aid treatment. Cover injured eye with a moist dressing and the other eye with a dry dressing, and support the object if it protrudes to prevent movement. A protective cup for the eye can be made from a plastic or styrofoam cup taped over the affected eye, with a moist dressing inside. Immediately refer the patient for further medical care.
Caustics, Acids, or Burns	May include remains of the substance itself, pain, swelling, discoloration of the skin, peeling of skin, and blisters.	Immediately flush both eyes with large quantities of gently flowing water. Each eye should be flushed with water for a minimum of 15 minutes with the water flowing away from the unaffected eye. Never use a neutralizing agent for flushing, use only plain tap water. A moist dressing may be helpful. After flushing, refer the patient for further medical care.

Fish Bites and Stings

H.16. Types of Bites and Stings

Fish bites and stings are another common problem encountered by boat crews during rescues. They can range from innocuous to deadly, and boat crewmembers must be constantly alert to identify bites and stings as quickly as possible. Many bites and stings may result in swelling of the affected body part. For this reason, all jewelry should be removed from the affected area or limb to prevent greater damage.

Victims may suffer many different types of fish bites and stings. The types encountered will depend in large part on the area of operations and the sea life that exists there. It is important to become familiar with the most common types of fish bites and stings that are encountered and the proper treatments for them. If removal of stingers or tentacles is required, care should be used to protect the rescuer from exposure.

H.17. Effects and Treatment

The following describes the effects and proper treatment for various fish bites/stings encountered:

Bite/Sting	Effects	Treatment
Shark & Barracuda Bites	Generally loss of large amounts of tissue.	Prompt and vigorous action to control hemorrhage and shock are required to save a victim's life. Control bleeding with pressure dressings, if possible. If not, use tourniquets. Seek medical help immediately.
Fish Stings (e.g. lionfish, puffer fish, scorpion fish, Caribbean fire coral)	Symptoms include: (01) Burning, (02) Stinging, (03) Redness, (04) Swelling, (05) Rash, (06) Blisters, (07) Abdominal cramps, (08) Numbness, (09) Dizziness, (10) Shock.	Individuals extremely sensitive to fish stings may rapidly go into shock and require immediate evacuation to save their life.
Portuguese Man-of-War & Jellyfish	Symptoms include: (01) Burning, (02) Stinging, (03) Redness, (04) Jelly-like matter from tentacles stuck on the body.	(01) Remove any remaining tentacles to prevent further damage, (02) Rinse the area with clean fresh or salt water and apply an ice pack to reduce pain, (03) Check with local medical facilities to learn advanced treatment for local species, (04) If the sting is serious, treat for shock and seek medical attention.

Bite/Sting	Effects	Treatment
Stingray Injuries	Typically a small open wound with swelling.	(01) Immediately irrigate the wound from a stingray with cold salt water. Most of the toxins will wash out and the cold water will reduce the pain, (02) Immerse the wounded area in hot water for 30 to 60 minutes. Keep the water as hot as a patient can tolerate without injury, (03) Apply hot compresses to wounds in areas not lending themselves to complete immersion, (04) Apply a sterile dressing after the soaking.
Sea snake/coral reef snakes	Symptoms include: (01) Headache, (02) Blurred vision, (03) Sensation of thick tongue, (04) Difficulty speaking or swallowing, (05) Thirst, (06) Sweating, (07) Vomiting, (08) Aching, (09) Stiffness, (10) Tenderness, (11) Paralysis.	(01) Seek medical help and anti-venom immediately, (02) Wrap limb with elastic bandage, (03) Immobilize effected limb with splint.

Near-Drowning

H.18. Mammalian Diving Reflex

Victims who inhale water or who are found floating face-down in the water may be suffering from near-drowning. Medical researchers have identified the phenomena of the "mammalian diving reflex." In this condition, a person immersed in water (particularly a child), even under ice, could still be alive. Even after extended periods of time, the body delivers a tiny trickle of oxygen to the brain. A victim also exhibits an almost complete constriction of all peripheral blood vessels. Their respiration and circulation almost completely stop. Properly administered CPR may successfully revive a near-drowning victim without serious complications, even after being underwater for an hour or longer.

H.19. Treatment

To treat a person in a near-drowning situation, perform the following procedures:

Step	Procedure
1	Evaluate CAB's.
2	Identify any other injuries.
3	Activate EMS.
4	Initiate CPR if indicated.
5	Treat for shock.
6	Inform unit of status of victim.
7	Transport as soon as possible.
8	Remove wet clothing (if dry clothes or blankets available).
9	Treat for hypothermia as appropriate.
10	Constantly monitor the victim's airway.
11	Re-evaluate victim's vital signs every 5 minutes if trained.
12	Document: (01) Length of submersion, (02) Water temperature, (03) Fresh or salt water, (04) Drug or alcohol use, (05) Any treatment rendered.

APPENDIX A Glossary

Introduction

This appendix contains a list of terms that may be useful when reading this Manual.

In this Appendix

This appendix contains the following information:

Topic	See Page
Glossary	A-1

TERM	DEFINITION
Air Emboli	A gas bubble trapped within a vein or artery.
Anaphylactic Shock	A rapid, extreme allergic reaction.
Bends	see Decompression sickness below
Cardiac Arrest	A sudden, sometimes temporary, cessation of function of the heart.
Cardiopulmonary Resuscitation (CPR)	A medical procedure involving repeated compression of a patient's chest and forcing of air into the lungs, performed in an attempt to restore the blood circulation and breathing of a person who has suffered cardiac arrest or a respiratory arrest.
Decompression Sickness	A condition that results when sudden decompression causes nitrogen bubbles to form in the tissues of the body, and can cause pain in the muscles and joints, cramps, numbness, nausea, and paralysis.
Dehydration	Is a harmful reduction in the amount of water in the body.
Fatigue	Physical or mental weariness due to exertion. Exhausting effort or activity. Weakness in material, such as metal or wood, resulting from prolonged stress.
First Degree Burn (superficial)	Burns that involve only the outer layer of skin and produce redness, increased warmth, tenderness, and mild pain.
Fractures (simple / compound)	A broken or cracked bone.

TERM	DEFINITION
Frostbite	The development of ice crystals within body tissues.
Heat Cramps	Painful contractions in the skeletal muscles caused by excessive salt and water depletion.
Heat Stroke	A condition marked by fever and often by unconsciousness, caused by failure of the body's temperature-regulating mechanism when exposed to excessively high temperatures.
Hemorrhage (bleeding)	Is the escape of blood from arteries, veins, or even capillaries because of a break in their walls.
Hypothermia	A lowering of the core body temperature due to exposure of cold (water or air) resulting in a subnormal body temperature that can be dangerous or fatal. The word literally means "under heated."
Medevac	"Medical Evacuation". Evacuation of a person for medical reasons.
Motion Sickness (Sea Sickness)	Nausea and/or vomiting caused by an imbalance between visual images and the portion of the middle ear that senses motion.
Mammalian Diving Reflex (Near Drowning)	The body's physiological response to submersion in cold water and includes selectively shutting down parts of the body in order to conserve energy for survival.
Heat Rash (Prickly Heat)	An itchy inflammation of the skin, typically with a rash of small vesicles, common in hot moist weather.
Second Degree Burn (partial-thickness)	Burns that involve the inner layers of the skin, but not enough to prevent rapid regeneration. They produce blisters and are characterized by severe pain, redness, and warmth.
Self Contained Underwater Breathing Apparatus (SCUBA)	Any breathing apparatus that is carried entirely by an underwater diver and provides the diver with breathing gas at the ambient pressure.
Shock	A medical emergency in which the organs and tissues of the body are not receiving an adequate flow of blood.
Splint	A strip of rigid material used for supporting and immobilizing a broken bone when it has been set.
Stroke	When blood flow to area in the brain is cut off.
Stokes Litter	A rescue device generally used to transport non-ambulatory persons or persons who have injuries that might be aggravated by other means of transportation.

TERM	DEFINITION
Swathe	A piece or strip of material in which something is wrapped.
Third Degree Burn (full-thickness)	Burns that penetrate the full thickness of the skin, destroying both the outer and inner layers. Severe pain, characteristic of second-degree burns, may be absent because nerve endings have been destroyed.
Tourniquet	A device for stopping the flow of blood through a vein or artery, typically by compressing a limb with a cord or tight bandage.
Triage	The process of assessing survivors according to medical condition and assigning them priorities for emergency care, treatment, and evacuation.
Wind-Chill Factor	An estimated measurement of the cooling effect of a combination of air temperature and wind speed in relation to the loss of body heat from exposed skin.

APPENDIX B List of Acronyms

Introduction

This appendix contains a list of acronyms that may be useful when reading this and other Coast Guard manuals.

In this Appendix

This appendix contains the following information:

Topic	See Page
List of Acronyms	B-2

ACRONYM	DEFINITION
A/C	Air Conditioning
AAR	After Action Report
ACFT	Aircraft
ACIP	Aviation Incentive Pay
ACMS	Aviation Computerized Maintenance System
ACP	Area Contingency Plan
ACP	Alternate Compliance Program
ACTSUS	Active Suspension
ADF	Automatic Radio Direction Finder
ADSW-AC	Active Duty Special Work in Support of Active Component
ADT	Active Duty for Training
ADT-AT	Active Duty Training for Annual Training
AEO	Assistant Engineering Officer
AEPO	Assistant Engineering Petty Officer
AFC	Allowance Fund Control
AFFF	Aqueous Film – Forming Foam
AIDS	Acquired Immunodeficiency Syndrome
AIM	Administrative Investigations Manual
AIS	Automatic Identification System
AH	Amplitude Modulation
AMIO	Alien/Migrant Interdiction Operation
AMS	Automated Manifest System
AMVER	Automated Mutual-Assistance Vessel Rescue
ANB	Aids to Navigation Boat
ANS	Aquatic Nuisance Species
ANSI	American National Standards Institute
ANT	Aids to Navigation Team
AOPS	Abstract of Operations
AOR	Area of Responsibility
API	American Petroleum Institute
APPS	Act to Prevent Pollution from Ships
APR	Aid Positioning Report

ACRONYM	DEFINITION
ASB	Arctic Survey Boat
ATB	Aviation Training Boat
AtoN	Aids to Navigation
AtoNIS	Aids to Navigation Information System
ATR	Ammunition Transaction Report
AUXCOM	Auxiliary Boat Commander
AUX DATA	Auxiliary Data
AUXPATCOM	Auxiliary Patrol Commander
AV	Aid Verifier
BA	Bridge Administration
BAC	Blood Alcohol Content
BAS	Basic Allowance for Subsistence
BCEB	Boat Crew Examination Boards
BCM	Boat Crewmember
BCMP	Boat Class Maintenance Plan
BDCM	Buoy Deck Crewmember
BDS	Buoy Deck Supervisor
BECCE	Basic Engineering Casualty Control Exercises
BEQ	Bachelor Enlisted Quarters
BM	Boatswain's Mate
BNTM	Broadcast Notice to Mariners
BO	Boarding Officer
BO/BTM PQS	Boarding Officer / Boarding Team Member Personnel Qualification Standard
BOSN	Boatswain
BS	Breaking Strength
BSC	Boating Safety Circular
BTM	Boarding Team Member
BUSL	Buoy Utility Stern Loading
BWI	Boating While Intoxicated
BWM	Ballast Water Management
C2	Command and Control
C2PC	Command/Control Personal Computer
CABs	Compressions, Airway, and Breathing

ACRONYM	DEFINITION
CAC	Crisis Action Center
CASCOR	Casualty Correct
CASREP	Casualty Report
CBL	Commercial Bill of Lading
CB-L	Cutter Boat – Large
CB-M	Cutter Boat – Medium
CB-OTH	Cutter Boat – Over the Horizon
CBRN	Chemical, Biological, Radiological, Nuclear
CB-S	Cutter Boat – Small
CDAR	Collateral Duty Addictions Representative
CDI	Course Deviation Indicator
CDO	Command Duty Officer
CDR	Commander
CDV	Course Deviation Variance
CEM	Crew Endurance Management
CERCLA	Comprehensive Environment Compensation and Liability Act
CEU	Civil Engineering Unit
CF	Comparison Factors
CFC	Combined Federal Campaign
CFR	Code of Federal Regulations
CFVS	Commercial Fishing Vessel Safety
CGADD	Coast Guard Addendum
CGDF	Coast Guard Dining Facility
CGIS	Coast Guard Investigative Service
CGPC	Coast Guard Personnel Command
CIC	Combat Information Center
CIO	Command Intelligence Officer
CISM	Critical Incident Stress Management
CM	Configuration Management
CMAA	Chief Master at Arms
CMCO	Classified Material Control Officer
CMG	Course Made Good
CMS	COMSEC (Communication Security) Material System

ACRONYM	DEFINITION
CO	Commanding Officer or Carbon Monoxide
CO/OIC	Commanding Officer/Officer-in-Charge
COCO	Chief of Contracting Officer
COFR	Certificate of Financial Responsibility
COG	Course Over Ground
COI	Certificate of Inspection
COLREG	International Regulations for Preventing Collisions at Sea
COMCEN	Communications Center
COMDTINST	Commandant Instruction
COMINT	Communications Intelligence
COMMS	Communications
CONOPS	Concept of Operations
COR	Certificate of Registry
COTP	Captain-of-the-Port
COTR	Contracting Officer's Technical Representative
CPC	Commandant's Performance Challenge
CPO	Chief Petty Officer
CPR	Cardiopulmonary Resuscitation
CPU	Central Processing Unit
CQA	Commandant's Quality Award
CRT	Cathode Ray Tube
CS	Creeping Line Search
CSIM	Control Station Interface Module
CSMP	Current Ship's Maintenance Project
CSP	Commence Search Point
CSP	Career Sea Pay
CVE	Control Verification Examination
CVS	Commercial Vessel Safety
CWO	Chief Warrant Officer
DAMA	Demand Assigned Multiple Access
DAN	Driver's Alert Network
DANTES	Defense Activity for Non-Traditional Education Support
DAPA	Drug and Alcohol Program Administration

ACRONYM	DEFINITION
DDEC	Detroit Diesel Electronically Controlled
DEER	Defense Enrollment and Eligibility Reporting System
DEMPs	Diesel Engine Maintenance Programs
DF	Direction Finding
DGPS	Differential Global Positioning System
DICP	Drop-In Communications Package
DISREP	Discrepancy Report
DISREPS	Discrepancy Report
DIW	Dead-in-the-Water
DMA	Defense Mapping Agency
DMB	Data Marker Buoy
DMOA	Designated Medical Officer Advisor
DMS	Docket Management System
DO	Defense Operations
DoD	Department of Defense
DONCAF	Department of the Navy Central Adjudication Facility
DOT	Department of Transportation
DPB	Deployable Pursuit Boat
DR	Dead Reckoning
DSC	Digital Selective Calling
DVL	Digital Voice Logger
DWO	Deck Watch Officer
DWONR	Deck Watch Officer Navigation Rules
EAP	Employee Assistance Program
EAPC	Employee Assistance Program Coordinator
EBL	Electronic Bearing Line
EC	Electronic Control
EC	Engineering Change
ECM	Electronic Control Module
ECR	Engineering Change Request
ECS	Electronic Chart System
EDF	Enlisted Drug Facilities
EDM	Electronic Display Module

ACRONYM	DEFINITION
EEZ	Exclusive Economic Zone
EGIM	Electronic Gear Interface Module
ELC	Engineering Logistics Center
ELINT	Electronics Intelligence
ELT	Emergency Locator Transmitter
ELT	Enforcement of Laws and Treaties
EMI	Extra Military Instruction
EMS	Emergency Medical Services
EMT	Emergency Medical Technician
EO	Engineering Officer
EOCT	End-of-Course Test
EP	Estimated Position
EPA	Environmental Protection Agency
EPES	Enlisted Personnel Evaluation System
EPIRB	Emergency Position Indicating Radio Beacon
EPO	Engineering Petty Officer
EPO/EO	Engineering Petty Officer/Engineering Officer
EPS	Environmental Protection Specialist
ERIM	Engine Room Interface Module
ESA	Endangered Species Act
ESD	Electronics Support Detachment
ESU/D	Electronics Support Unit/detachment
ET	Electronics Technician
ETA	Electronic Transportation Acquisition
ETA	Estimated Time of Arrival
EXCOM	Extended Communications
FAA	Federal Aviation Agency
FAR	Family Advocacy Representative
FAR	Federal Acquisition Regulations
FAST	Facial Drooping, Arm Weakness, Speech Difficulty, and Time is Critical
FBIS	Foreign Broadcast Information Service
FEDEX	Federal Express
FEEF	Federal Energy Efficiency Funding

ACRONYM	DEFINITION
FFCS	Full Function Crew Station
FID	Field Information Document
FINCEN	Finance Center
FIR	Field Intelligence Report
FL	Fitness Leader
FLOCS	Fast Lubricating Oil Change System
FLS	Fleet Logistics Supply
FM	Frequency Modulation
FMP	Fisheries Management Plan
FOIA	Freedom of Information Act
FOSC	Federal On-Scene Coordinator
FOUO	For Official Use Only
FPCON	Force Protection Conditions
FPM	Feet Per Minute
FRP	Fiberglass Reinforced Plastic
FS	Food Service Specialist
FSC	Federal Supply Classification
FSI	Field Sobriety Test
FSIC	Fiscal, Sanitation, Immigration or Customs
FSO	Food Services Officer
FWPCA	Federal Water Pollution Control Act
FWS	Fish and Wildlife Service
GAR	Green-Amber-Red
GFM	Global Freight Management
GMDSS	Global Maritime Distress and Safety System
G-OCS	Office of Boat Forces
G-OI	Office of Intelligence
GPH	Gallons Per Hour
GPS	Global Positioning System
GRUCOM	Group Commander
GSA	Government Service Administration
GTA	Government Transportation Account
GV	Government Vehicle

ACRONYM	DEFINITION
HAZCOM	Hazardous Communication
HAZMAT	Hazardous Material
HAZWASTE	Hazardous Waste
HCPV/HIV	High Capacity Passenger Vessel/High Interest Vessel
HDOP	Horizontal Dilution of Precision
HEA	Harbor Entrance and Approach
HELP	Heat Escape Lessening Position
HF	High Frequency
HIN	Hull Identification Number
HIV	Human Immunodeficiency Virus
HS	Homeland Security
HPU	Hydraulic Power Unit
HRSIC	Human Resources Services and Information Center
HSC	Harbor Safety Committee
HUMINT	Human Intelligence
HVAC	Heating, Ventilation, and Air Conditioning
IACS	International Association of Classification Societies
IALA	International Association of Lighthouse Authorities
IAMSAR	International Aeronautical and Maritime Search and Rescue
I-AtoNIS	Integrated Aids to Navigation Information Systems
ICA	Individual Credit Accounts
ICAO	International Civil Aviation Organization
ICC	Intelligence Coordination Center
ICLL	International Convention on Load Lines
ICMTS	Interagency Committee of the Marine Transportation System
ICS	Incident Command System
ICV	Intercommunicating Fill Valve
ICW	Intracoastal Waterway
IDT	Inactive Duty for Training
IEC	International Electrotechnical Commission
IIP	International Ice Patrol
IIR	Intelligence Information Report
IIRAIRA	Illegal Immigration Reform and Immigrant Responsibility Act

ACRONYM	DEFINITION
ILO	International Labor Organization
IMARV	Independent Maritime Response Vessel
IMO	International Maritime Organization
IMPAC	International Merchant Purchase Authorization Card
INA	Immigration and Nationality Act
INS	Immigration and Naturalization Service
IPIECA	International Petroleum Industry Environmental Conservation Association
IPS	International Pipe Standard
IRIS	Incident Reporting Information System
ISC	Integrated Support Command
ISM	International Ship Management
ISO	International Standards Organization
IT	Information Systems Technician
IUU	Illegal, Unreported, and Unregulated
JOOD	Junior Officer of the Day
JQR	Job Qualification Requirement
KO	Contracting Officer
LC	Load Center
LCD	Liquid Crystal Display
LCVP	Landing Craft, Vehicle, Personnel
LE	Law Enforcement
LEISII	Law Enforcement Information System II
LEMAN	Law Enforcement Manual
LEO	Law Enforcement Officer
LEQB	Law Enforcement Qualification Board
LEU	Law Enforcement Unit
LHA	Local Housing Authority
LHI	Local Housing Inspector
LIR	Letter Incident Report
LKP	Last Known Position
LLNR	*Light List* Number
LMR	Living Marine Resource
LNB	Large Navigation Buoy

ACRONYM	DEFINITION
LNG	Liquid Natural Gas
LOA	Length Overall
LOB	Line-of-Bearing
LOC	Letter of Commendation or Level of Consciousness
LOGREQ	Logistics Requirements
LOP	Line of Position
LORAN-C	Long-Range Aid to Navigation
LORSTA	LORAN Station
LOS	Line-of-Sight
LUFS	Large Unit Financial System
LUT	Local User Terminal
LWL	Length on Waterline
MAA	Master at Arms
MARB	Maritime Assistance Request Broadcast
MARPOL	International Convention for the Prevention of Pollution from Ships
MARSEC	Marine Security Conditions
MASINT	Measurement and Signature Intelligence
MAW	Maximum Allowable Weight
MBR INT	Member's Initials
MCB	Motor Cargo Boat
MCM	Manual for Courts-Martial
MCS	Master Control Station
MDA	Maritime Domain Awareness
MDV	Marine Dealer Visit
MDZ	Maritime Defense Zone
MEDICO	Medical Advice
MEDEVAC	Medical Evacuation
MEP	Marine Environmental Protection
MEPC	Marine Environment Protection Committee
MER	Marine Environmental Response
MF	Medium Frequency
MFPU	Maritime Force Protection Unit
MHS	Maritime Homeland Security

ACRONYM	DEFINITION
MI	Marine Information
MI	Maintenance Inspection
MI & R	Maintenance, Improvement and Repair
MIC	Manufacturer Identification Code
MICA	Management Information for Configuration and Allowances
MICA	Machinery Information Catalog Allowance
MIM	Marine Interface Module
MISLE	Marine Information for Safety and Law Enforcement
MJM	Military Justice Manual
MLB	Motor Lifeboat
MLC	Maintenance and Logistics Command
MLCPAC	Maintenance and Logistics Command Pacific
MMD	Merchant Mariner Document
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Services
MMSI	Maritime Mobile Service Identity
MOA	Memorandum of Agreement
MOB	Man Overboard
MOU	Memorandum of Understanding
MPR	Multiple Persons-in-the-Water
MPS	Marine Protected Species
MRE	Military Rule of Evidence
MRR	Medium-Range Recovery
MSAP	Maritime SAR Assistance Policy
MSB	Motor Surf Boat
MSC	Marine Safety Center
MSFCMA	Magnuson-Stevens Fisheries Conservation and Management Act
MSO	Maintenance Support Outline
MSO	Marine Safety Office
MSS	Marine Safety and Security
MSST	Maritime Safety and Security Team
MTL	Master Training List
MTS	Marine Transportation System

ACRONYM	DEFINITION
MTSNAC	Marine Transportation System National Advisory Council
MWR	Moral, Welfare and Recreation
NAFA	Non-Appropriated Fund Activity
NAVAIDS	Navigational Aids
NAVRULS	Navigation Rules
NCP	National Contingency Plan
NCW	Naval Coastal Warfare
NDRS	National Distress Response System
NDRSMP	National Distress Response System Modernization Project
NDS	National Distress System
NESU	Naval Engineering Support Unit
NJP	Non-Judicial Punishment
NLB	Nearshore Life Boat
NLT	No Later Than
NM	Nautical Miles
NMEA	National Marine Electronics Association
NMFS	National Marine Fisheries Service
NMLBS	National Motor Lifeboat School
NOS	National Ocean Survey
NOAA	National Oceanic and Atmospheric Administration
NRC	National Response Center
NRT	National Response Team
NSARC	National Search and Rescue Committee
NSB	Non-Standard Boat
NSF	National Strike Force
NSFCC	National Strike Force Coordination Center
NSN	National Stock Number
NSP	National Search and Rescue Plan
NSS	National Search and Rescue Supplement
NTP	Naval Training Publication
NVDC	National Vessel Documentation Center
NVIC	Navigation and Vessel Inspection Circular
NWP	Naval Warfare Publication

ACRONYM	DEFINITION
OBA	Oxygen Breathing Apparatus
O/S WX	On-Scene Weather
OCMI	Officer-in-Charge Marine Inspection
OER	Officer Evaluation Report
OIC	Officer-in-Charge
OIC INT	Officer in Charge's Initials
OJT	On-the-Job Training
OM & S	Operating Materials and Supplies
OMMP	Occupational Medical Monitoring Program
OOD	Officer of the Deck (Day)
OPA	Oil Pollution Act
OPAREA	Operational Area
OPCEN	Operations Center
OPCON	Operational Control
OPFAC	Operating Facility
OPLAN	Operations Plan
OPORD	Operations Order
OPORDER	Operations Order
OQB	Operations Qualification Board
ORM	Operational Risk Management
OS	Operations Specialist
OSB	Operations Standards Board
OSC	Operations Systems Center
OSC	On-Scene Commander
OSHA	Occupational Safety and Health Administration
OTC	Officer in Tactical Command
PA	Privacy Act
PAL	Personnel Allowance List
PALMS	Patrol Order Management System
PAO	Public Affairs Officer
PATCOM	Patrol Commander
PAWSS	Ports and Waterways Safety System
PCS	Permanent Change of Station

ACRONYM	DEFINITION
PDD	Presidential Decision Directive
PDR	Personnel Data Record
PDS	Personnel Data System
PERSRU	Personnel Reporting Unit
PES	Port and Environmental Safety
PFD	Personal Flotation Device
PI	Personnel Inspection
PIAT	Public Information Assistance Team
PIE	Partnership in Education
PIW	Person-in-the-Water
PLB	Personal Locator Beacon
PMIS/JUMPS	Personnel Management Information System/Joint Uniform Military Pay System
PMLV	Personnel Marker Light
PMS	Preventative/Planned Maintenance System
PO	Petty Officer
POB	Persons Onboard
POD	Probability of Detection
POP	Planned Obligation Priority
POS	Probability of Success
POPFAC	Parent Operating Facility
POW	Plan of the Week
PPE	Personal Protective Equipment
PPI	Plan Position Indicator
PPS	Precise Positioning Service
PQS	Personnel Qualification Standard
PR	Position Report
PRECOM	Preliminary Communications
PREP	Preparedness for Response Exercise Program
PS	Parallel Search
PSCO	Port State Control Officer
PSU	Port Security Unit
PTO	Power Take-Off
PWB	Port and Waterways Boat

ACRONYM	DEFINITION
PWSA	Ports and Waterway Safety Act
QAWTD	Quick-Acting Watertight Door
QEB	Qualification Examining Board
QRC	Quick Response Card
RACON	Radar Beacon
RB-HS	Response Boat-Homeland Security
RB-M	Response Boat-Medium
RBS	Recreational Boating Safety
RB-S	Response Boat-Small
RCC	Rescue Coordination Center
RDF	Radio Direction Finder
RFMC	Regional Fisheries Management Council
RFMO	Regional Fisheries Management Organization
RFO	Ready for Operations
RIK	Rations-In-Kind
RMS	Readiness Management System
RNAV	Radio Aids to Navigation
ROC/POE	Required Operational Capability/Point of Entry
RP	Responsible Party
RPAL	Reserve Personnel Allowance List
RS	Rescue Swimmer
RSC	Rescue Sub-Center
RT	Receiver/Transmitter
SAFE	Substance Abuse Free Environment
SAI	Small Arms Instructor
SAP	Simplified Acquisition Procedures
SAR	Search and Rescue
SAREX	SAR Exercise
SARMIS	Search and Rescue Mission Information System
SARSAT	Search and Rescue Satellite Aided Tracking
SAT	Subsistence Advisory Team
SATCOM	Satellite Communication
SB	Sailboat

ACRONYM	DEFINITION
SC	SAR Coordinator
SCUBA	Self-Contained Underwater Breathing Apparatus
SDB	Service Dress Blue
SDO	Sector Duty Officer
SEAOP	Special and Emergency Operations Procedure
SEPRATS	Separate Rations
SF	Safety Factor
SIGINT	Signals Intelligence
SIPRNET	Secret Internet Protocol Routing Network
SITREP	Situation Report
SKF	Skiff
SLDMB	Self Locating Datum Marker Buoy
SMC	SAR Mission Coordinator
SMS	Safety Management System
SMTJ	Special Maritime and Territorial Jurisdiction
SNO	Statement of No Objection
SOA	Speed of Advance
SOG	Speed Over Ground
SOLAS	Safety of Life at Sea
SO-OP	Auxiliary Division Operations Officer
SOP	Standard Operating Procedure
SOPA	Senior Officer Present Afloat
SOPEP	Shipboard Oil Pollution Emergency Plan
SOQ	Sailor of the Quarter
SOS	Save Our Ship
SPC	Special Purpose Craft
SPC (HWX)	Heavy Weather Special Purpose Craft
SPC (LE)	Special Purpose Craft (Law Enforcement)
SPE	Severity-Probability-Exposure
SPF	Sun Protection Factor
SPOC	SAR Point of Contact
SPS	Standard Positioning Service
SRA	Short-Range Aids to Navigation

ACRONYM	DEFINITION
SROE	Standing Rules of Engagement
SRR	Search and Rescue Region
SRR	Short-Range Recovery
SRS	Synchronous Reference Sensor
SRU	Search and Rescue Unit
SS	Square Search
SSB	Single Side Band
SSB-HF	Single Side Band - High Frequency
SSL	Standard Support Level
SSM	Support and Special Mission
SSMR	Shore Station Maintenance Record
SSPO	Station Support Petty Officer
STA OPS	Station Operations
STAN & RFO	Readiness and Standardization Program
STANT	Station Aids to Navigation Team
STAR	Standard Automated Requisitioning
STCW	Standards of Training, Certification and Watchkeeping for Seafarers
STTR	Short Term Resident Training Request
STU III	Secure Telephone Unit
SURPIC	Surface Picture
SWE	Service-wide Exam
SWL	Safe Working Load
TACON	Tactical Control
TAD	Temporary Assigned Duty
TAIT	Temporary Access Inventory Tool
TANB	Trailerable Aids to Navigation Boat
TB	Tuberculosis
TBSA	Total Body Surface Area
TC	Technical Committee
TCM	Telecommunications Manual
TCOW	Telecommunications Watchstander
TCT	Team Coordination Training
TD	Temporary Duty

ACRONYM	DEFINITION
TD	Time Difference
TFC	Total Fuel Consumption
THREATCON	Threat Conditions
TMT	Training Management Tool
TOI	Target of Interest
TPSB	Transportable Port Security Boat
TQC	Training Quota Management Center
TRACEN	Training Center
TRATEAM	Training Team
TRS	Timing Reference Sensor
TSN	Track Line Non-Return Search
TSR	Track Line Return Search
U/W	Underway
UCMJ	Uniform Code of Military Justice
UEG	Unit Environmental Guide
UEPH	Unaccompanied Enlisted Personnel Housing
UHF	Ultra High Frequency
UMI	Universal Marine Interface
UMIB	Urgent Marine Information Broadcast
UOF	Use of Force
UPF	Unit Performance Factor
UPH	Unaccompanied Personnel Housing
UPS	United Parcel Service
USBP	United States Border Patrol
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USPS	U.S. Power Squadron
USWMS	Uniform State Waterway Marking System
UTB	Utility Boat
UTBSC	Utility Boat Systems Center
UTC	Coordinated Universal Time
UTL	Utility Boat Light
UTM	Utility Boat Medium

ACRONYM	DEFINITION
UTS	Unit Travel System
UV	Ultraviolet
VHA	Variable Housing Allowance
VHF	Very High Frequency
VRM	Variable Range Marker
VRO	Variable Ratio Oiler
VRP	Vessel Response Plan
VS	Sector Search
VSC	Vessel Safety Check
VTS	Vessel Traffic Services
WP	Working Punt
WAAS	Wide Area Augmentation System
WAMS	Waterways Analysis and Management System
WC	Wellness Coordinator
WLIC	Construction Tender
WLL	Working Load Limit
WPB	Patrol Boat
WR	Wellness Representative
WWM	Waterways Management
XO	Executive Officer
XPO	Executive Petty Officer
XTE	Cross Track Error