



**THE SHIP'S
MEDICINE CHEST
AND
MEDICAL AID
AT SEA**



THE SHIP'S MEDICINE CHEST AND MEDICAL AID AT SEA



U.S. Department of Health and Human Services
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**This revision supercedes PHS Miscellaneous Publication No. 9 entitled:
The Ship's Medicine Chest and First Aid at Sea, reprinted with additions
and changes in 1955, 1978, and 1984.**

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**Note: The photographs on the cover and the dedication page were taken at the U.S.
Merchant Marine Academy, Kings Point, New York by James A. Calderwood, Jr.**

Dedicated to American Merchant Mariners and others who risk their lives at sea.



DISCLAIMER

The practice of medicine is an art and a science, and is evolving daily as new discoveries are made. Each individual medical provider is responsible for the individual medical care provided to each patient. Each provider must assess the patient and determine the specific clinical needs and most appropriate treatment for that patient. This book is not meant to be a substitute for medical practitioners or good clinical judgment, nor does it intend to determine the standards of medical care in any given situation.

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HISTORICAL BACKGROUND

This edition of *The Ship's Medicine Chest and Medical Aid at Sea* continues a tradition that extends back for more than a century. The first edition of this book was published by the Marine Hospital Service, forerunner of the United States Public Health Service, in 1881.

The Marine Hospital Service was established by the Federal Government in 1798 to provide medical care to sick and disabled American merchant seamen. The first permanent Marine hospital was authorized on May 3, 1802 to be built in Boston. The Service was just a loosely knit group of hospitals for merchant seamen until 1870 when it was reorganized and the administration of the hospitals centralized in Washington, D.C. A Supervising Surgeon, Dr. John Maynard Woodworth, was appointed to head the Service in 1871. His title was changed to Supervising Surgeon General (later Surgeon General) in 1875. Under Woodworth, the Marine Hospital Service began its transformation into the disciplined and broad-based Public Health Service (the name it received in 1912) of the future. Dr. Woodworth adopted a military model and put his physician "officers" in uniform. In 1889, the Service's Commissioned Corps was formally established by law.

Even before the establishment of the Marine Hospital Service, Federal legislation had been enacted in 1790 which required every American flag vessel over 150 tons with a crew of ten or more to carry a medicine chest. Since merchant ships typically did not carry a physician, there was obviously a need to provide some kind of basic medical instruction for the seamen that went beyond the simple directions that frequently accompanied medicine chests. Although there was no Government-issued manual for this purpose for almost a century after the passage of the 1790 law, merchant seamen could consult works published by private physicians, such as Joseph Bonds' *The Master-Mariners Guide in the Management of His Ship's Company, with Respect to Their Health, being Designed to Accompany a Ship's Medicine Chest* (Boston, 1847). Bond explained his reasons for preparing his book as follows:

"My apology for the undertaking is, that in the medicine-chests for the use of the vessels belonging to our posts, I have never seen books of directions that are suitable. This little work is to supply the deficiency which must have been felt by every shipmaster, having no other guide in the management of disease than the small book of directions usually accompanying medicine chests."

In 1881, the Marine Hospital Service decided to issue its own medical manual, the ancestor of the present volume, under the title, *Handbook for the Ship's Medicine Chest* (Washington, D.C., 1881). In his preface to the book, Supervising Surgeon General John B. Hamilton explained the purpose of the handbook as follows:

"This book is issued only to vessels subject to the payment of hospital dues, and is intended to be one to which the master or other officer in charge of a vessel

may refer for information upon the occasion of an injury to any of the crew or the appearance of sickness among them, to aid in obtaining a knowledge of the act of preventing disease, to give the necessary information as to the means of obtaining hospital or dispensary relief, and to serve as a guide to the proper use of the medicine chest required by law to be kept on board.”

The book was divided into several sections. It began with a brief discussion of disease prevention, followed by a list of all of the medicines and supplies that should be in the ship’s medicine chest. The longest portion of the book was a discussion of various accidents and illnesses and how to treat them. Also included in the work was information on the ports where Marine Hospital Service or contract physicians were available to treat seamen. Finally, an appendix provided information on the nature and purposes of the Marine Hospital Service and the laws related to it. Examples of items to be carried in the medicine chest were adhesive plaster, bandages, castor oil, calomel, chloroform liniment, fluid extract of ginger, opium, quinine, saltpeter, salicylic acid, sodium bicarbonate, surgeon’s needles, and a tooth forceps. The ship’s master was admonished to inspect the medicine chest carefully before starting out to sea to be sure that it was furnished with all of the items on the list. The many injuries and diseases discussed included fractures, dislocations, malarial fevers, dysentery, yellow fever, cholera, scurvy, syphilis, delirium tremors, and smallpox. Resuscitation after near drowning also received attention.

The case of yellow fever may be cited as an example of a treatment regimen for a disease. The caregiver was instructed to begin treatment with senna tea as a laxative. If the skin was very dry, the legs should be rubbed with mustard water. If the patient was vomiting, a nitre mixture (consisting of saltpeter, water, and an alcoholic solution of ethyl nitrite) would also be given. If the fever was high, quinine was also administered. The handbook goes on to discuss three cardinal rules to observe in treating yellow fever. First, insure that the patient gets sufficient rest by giving Dover’s powder (which contained opium) and inducing the patient to remain in bed. Second, insure free action of the skin by warm baths and sweating medicines. Third, strengthen the patient by means of weak whiskey and water, beef tea, quinine, and other stimulants. The patients would not be given any solid food until after convalescence.

The handbook proved to be so useful that a second edition, revised and expanded appeared in 1904. Containing 101 pages, the second edition was more than twice the size of the original 45-page publication. The work continued to be revised and new editions issued over the course of the twentieth century. In addition to the two editions previously noted, the National Library of Medicine holds editions published in 1929, 1947 (reprinted with additions and changes in 1955), 1978, and 1984.

By the 1929 edition, the book’s title had changed to *The Ship’s Medicine Chest and First Aid at Sea*. With the 1978 edition, the title was slightly altered to *The Ship’s Medicine Chest and Medical Aid at Sea*, perhaps to emphasize the fact that medical care going beyond what we normally think of as first aid would often be required aboard ships. By the time that the 1984 edition was issued,

legislation in 1981 had ended the entitlement of merchant seamen to the provision of health care by the Public Health Service and closed the PHS hospitals. Consistent with its origins as a health care system for merchant seamen, however, the PHS continues to produce the book. Although designed for use aboard merchant ships, the work has also found use over the years in other situations, such as on fishing vessels and in backwoods areas. For over 100 years it has filled a need for reliable medical information in cases where medical care by a health professional is not available.

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FOREWORD

The need for medical care has been a constant since the day the first merchant ship sailed centuries ago. Concern for the health of merchant mariners has, from the beginning, been a part of our nation's history. In the 1700's, legislation mandated that a Medicine Chest be carried on each American Flag vessel of more than 150 tons, provided it had a crew of ten or more. By 1798, a loose network of marine hospitals, mainly in port cities, was established by Congress to care for sick and disabled American merchant seamen. Called the Marine Hospital Service, later the Public Health and Marine Hospital Service, and finally the Public Health Service, these federal entities continued to provide healthcare to merchant seamen until 1981.

The Ship's Medicine Chest and Medical Aid at Sea has been a part of much of this maritime history. This edition has evolved through many previous editions. The Public Health Service published the first Medicine Chest in 1881 under the title, *Handbook for the Ship's Medicine Chest*.

The early editions of the Medicine Chest provided step-by-step instructions on how to treat a variety of illnesses that might be expected underway when the ship was days from shore, and had limited communication with land. The master or designated crewmember had to independently manage whatever injury or illness might occur.

Fortunately, for the health of all merchant seamen and others at sea, the world has changed. Modern technology allows for nearly continual "real-time" communication between the ship and shore. With this, real-time access to medical consultation is nearly always available. In today's world, serious medical problems underway will be managed via communication with shore-based physicians and other medical resources. More sophisticated tele-medicine capabilities, often including video as well as audio components, are also continually being expanded.

As a result of these changes in technology and medical practice, this edition has limited the "how to" aspects of medical management. Instead, it identifies when medical consultation may be needed, and describes how to do a basic physical exam and then how to communicate these medical findings to shore-based experts. As in any aspect of treatment or consultation, effective communication is key to quality healthcare.

Another focus of this edition is prevention. Prevention, of both acute and chronic disease, will improve the quality of the merchant mariner's life while at sea, and also many years into retirement. Prevention will also maximize the productivity of the crew and its ability to meet its missions.

The edition, like past editions, has many audiences. The appendices on U.S. Coast Guard health capability requirements will be of particular value to merchant mariners. Much of the public health information has a much broader audience, and will be of value to those with private craft as well. Where possible, websites have been provided to assist in reaching additional reliable resources of information.

Ensuring your health and safety, as our merchant mariners, is a priority to all of us who greatly benefit from your service – we thank you for what you have and will do for America! And may you have fair winds and following seas....

A handwritten signature in black ink that reads "Richard H. Carmona". The signature is written in a cursive, flowing style.

Richard H. Carmona, M.D., M.P.H., F.A.C.S
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INTRODUCTION AND HOW TO USE THIS BOOK

When the original edition of the predecessor to *The Ship's Medicine Chest* was published over a century ago, a ship at sea was alone. Depending upon location and other factors there was limited, if any, communication with other sea-going vessels or with shore-based medical facilities. If a crew member suffered illness or injury it had to be managed by another crew member. Thus, the earlier editions of this book focused on specific medical treatments.

With today's technology, the world is different. Medical practice underway is different. The ship's captain and the person on board assigned responsibility for medical care have many more tools available than did the health provider of the past. The internet and satellite communication have greatly expanded the immediately available knowledge base.

This edition of *The Ship's Medicine Chest and Medical Aid at Sea*, then, is very different from past editions. It is not meant to be a detailed "how to" book for specific diseases. Current information on specific diagnostic and treatment protocols is better obtained from onshore medical consultation and reliable internet sources (such as *The Virtual Naval Hospital* and other publicly available resources described throughout this book.) Instead, the purpose of this edition is to provide enough information so that someone, who has had the required classroom and other practical skills training, can examine a patient and appropriately communicate the medical findings to a shore-based practitioner. Some essential skills, such as cardio-pulmonary resuscitation, have been purposely omitted because they are continually being modified and are best taught in a classroom with "hands on" experience.

Further, in today's world, there is a new emphasis on prevention and public health. The health practitioner's role has expanded beyond the treatment of the individual patient. Responsibilities also include public health duties to assure the health and safety of the entire crew. Thus, the goal of this edition is to provide the reader with a basic understanding of the importance of public health practice as it relates to shipboard operation. The text is readable and provides a basic introduction of concepts. For example, this edition has chapters on communicable disease prevention, ship sanitation and legal issues. Specific chapters are devoted to dental emergencies, substance abuse and hypothermia because of the particular challenges they cause underway. Though public health is important, wellness and lifestyle are primarily personal responsibilities. Thus there are also chapters on personal preventive practices and women's health. Considering today's international and domestic risks, a chapter has been included on the medical aspects of terrorism.

Though today's shipboard health provider has new and expanded resources as compared to days past, some specific skills are also required. He/she must know how to treat minor conditions independently, and also to recognize when these minor conditions are a sign of something more serious. Further, to make effective use of shore-based consultation, the ship-board health provider must, among other things, know how to do a complete history and physical, and communicate the findings.

To better delineate these needed medical competencies. The International Maritime Organization (IMO) in London has adopted the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). These are qualification standards (including health care related standards) for masters, officers and watch personnel on seagoing merchant ships. The United States Coast Guard developed standards and procedures, and performance measures for use by designated examiners to evaluate competence in various areas. These are identified in Appendices A-E. These competencies are a pre-requisite to licensure. Appendix F provides a list of additional skills that have been found useful by some shipboard independent providers. Appendix G provides suggestions on how to equip a sickbay, recognizing that the specifics are dependent upon many variables such as the crew size, distance from ports and operational risk assessment.

For licensure, many aboard ship require specific health related credentials. Specific approved training classes are available for those needing to meet the STCW standards. *The Ship's Medicine Chest and Medical Aid at Sea* is not meant to be a substitute for these classes. Rather, it is meant to supplement them, though some sections of the book may be useful as course readings.

Many other sources are also available to help the health provider underway. Appendix I identifies some specific books and generally reliable internet resources that are useful references. The internet (or CD-ROMs where bandwidth and other factors may prevent reliable on-line access) provides an abundance of health-related resources, though care must be taken in selecting them as unreliable websites also exist.

The breadth and scope of the available web-based information has changed the function of this book. For example, *The Virtual Naval Hospital* (available at <http://www.vnh.org>) provides ready real-time on-line access to an entire medical library. (The WEBSITE provides order information for a CD-ROM version for those without reliable internet access underway.) Each person responsible for medical care at sea is strongly encouraged to familiarize themselves with the WEBSITE and the available references it provides long before there is a medical crisis. The midst of a medical emergency is not the time to begin exploring the contents of this valuable resource. *The Virtual Naval Hospital* provides detailed protocols and other information that is very useful in patient management and that is beyond the scope of this book.

Another resource available to the ship's health care provider is the capability for nearly constant real-time ship to shore communication. The ship's health care provider is no longer an "independent practitioner" except for minor complaints. When a crew member has a serious illness or injury, the ship's medical provider should contact a shore based physician or other health professional. Modern risk management requires this onshore back-up and consultation.

Arrangements for medical ship-to-shore communication must be made *before* they are needed. A shipping line should make arrangements to assure every ship's captain has access via radio (or other communication device) to primary care medical back-up with referral capability to the full range of medical specialties. It is critical that these medical communication networks are established *before* they are needed since there is not time to establish them in the height of a medical emergency.

Various arrangements for this coverage are possible, and various payment options also exist (fee-for-service, retainer, or a combination). To provide this ship-to-shore medical coverage, numerous medical consulting firms have been developed. They provide 24-hour primary care consultation with specialty referral available. Some also provide assistance if a crew member requires evacuation and/or medical care ashore in domestic or foreign ports.

Health care, in any setting, is a team effort. I hope that this book is helpful to every member of the health care team who is trying to assure the safest of voyages and the healthiest of crews.


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