

# Evaluation of the Marine Physician Assistant Program

WILLIAM J. A. DeMARIA, M.D., WILLIAM A. CHERRY, M.D., and DALE H. TREUSDELL, B.A., M.P.H.

*Dr. DeMaria is professor of pediatrics and assistant director of continuing education, Duke University School of Medicine, Durham, N.C. Dr. Cherry is director of the Public Health Service Hospital in New Orleans, La. Mr. Treusdell is continuing his studies at Tulane University; he was formerly director of the Office of Health Manpower Development, Federal Health Programs Service, Health Services and Mental Health Administration. Tearsheet requests to Dr. William J. A. DeMaria, Duke University School of Medicine, Durham, N.C. 27706.*

Formal standards of health care for seamen aboard ship have been virtually nonexistent. Available medical services have been woefully inadequate for the 40,000 persons who man the nearly 1,000 ships of the United States. Staffing every ship with physicians or nurses would be impracticable and unreasonable. Yet some controlled system of health care is necessary, especially if we apply medical experiences of civilians to the shipboard situation. Based on civilian experience, the average seaman seeks health or medical aid six times each year, and since he is at work about 9 months of the year, most illnesses occur aboard ship. The added hazards of shipboard life and the average age of the seamen (just over 50 years) appear to increase both the number and seriousness of his illnesses.

In January 1968, the Public Health Service and the Staff Officers' Association, a pursers' union and affiliate of the AFL-CIO, requested us to serve as a task force to evaluate their cooperative Marine Physician Assistant Program, conducted at the Public Health Service Hospital on Staten Island, N.Y. The objective of this program is to educate



*Public Health Service Hospital, Staten Island, overlooks the busy harbor of New York City.*

and train pursers to become marine physician's assistants. The course was designed to qualify the graduates to both recognize and manage common medical problems and to maintain health aboard ship under the radio-contact supervision of land-based physicians. Appropriately, the Marine Physician Assistant Program was conceived by those closest to the seamen, the leadership of the Staff Officers' Association, and implemented with the help of that unit of the Government possessing experience and responsibility in this area, the Public Health Service.



*Aboard ship, physician assistant practices removal of patient from Stokes basket.*



*Carrying a patient. Emergency care treatment is an important part of training.*

Through a series of meetings, we examined the entire program, including the administration, organization, faculty, students, and curriculum. We conducted a careful study of available shipboard health services and interviewed onsite early graduates of the program.

### **Background**

Interestingly, only limited attempts had been made by the world's merchant fleets to provide medical and health services for seamen. Their needs were recognized, however, as early as 1798, when the United States founded the Marine Hospital System. This system, which provided medical care for U.S. seamen when ashore, evolved into today's Public Health Service. Limited contact by ship-to-shore radio to provide medical advice came into use in the mid-1920's.

When the civilian fleet was federalized during World War II, the War Shipping Administration established a 4-month training course in the Assistant Purser-Hospital Corps School of the U.S. Maritime Service Specialists' School, Sheepshead Bay, Brooklyn. Some 800 pursers were trained and licensed as pharmacist mates by the U.S. Coast Guard under its wartime responsibilities for merchant shippers. This training was discontinued in the early 1950's. Through attrition, the number of pharmacist mates remaining with the merchant

fleet since then has been reduced to about 65 men.

Recognizing that health care aboard ship was inadequate, the Staff Officers' Association in 1961 formed a joint employer-union committee to consider the reinstatement of pharmacist mate training. The results of these studies substantiated the need for trained personnel to provide shipboard medical care for ill and injured seamen.

After 5 years of negotiations, the first class of physician's assistants entered training in September 1966. This training was made possible by a contribution of \$100,000 from the welfare reserves of the Staff Officers' Association, through operations support of \$150,000 from the U.S. Department of Labor; and through provision, by the Public Health Service, of its Staten Island hospital faculty, classroom space, and clinical facilities.

### **Organization of Program**

The director of training at the Public Health Service Hospital on Staten Island is the director of the Marine Physician Assistant Training Center. He reports to the director of the Public Health Service Hospital. The director of training and his assistant, the director of clinical education, are responsible for all academic functions including planning of the course, developing its content, operating the program, recruiting the faculty, and evaluating student performance.

The authors are greatly indebted to the late Dr. Eric R. Osterberg, director, Program of Continuing Education in Public Health, assistant professor of public health practice at Columbia University, and chairman of the task force. He gave greatly of himself in preparing the task-force report and in upgrading the Marine Physician Assistant Program.

The Staff Officers' Association has assigned a coordinator-instructor to be liaison officer between the Public Health Service and the association. He is charged with the nonacademic administrative responsibilities pertaining to the students' supplies, pay, and related matters. The necessity for adhering to this principle of clear separation between the academic and nonacademic components to maintain high educational standards has been affirmed by all the officials concerned with this program.

#### Method of Selecting Candidates

The selection of candidates is controlled by a committee composed of members who are not affiliated with either the Public Health Service or the Staff Officers' Association. One member is a physician associated with a school of public health, another is a rear admiral of the U.S. Merchant Marine Academy, and the third is a physician-pathologist.

All members of the Staff Officers' Association are eligible to apply for enrollment in the course; their applications are encouraged through regular announcements. All applications are received by the association management and reviewed by the committee. The candidate's education, length of service, and age are among the pertinent criteria weighed in the selection process. A recent innovation of a

*Instructor discusses clinical assignments*



12-week course of maritime training as a prerequisite to sailing as a purser, and also to becoming a member of the Staff Officers' Association, is an effective preselection mechanism.

#### Course Content and Faculty

The original curriculum of 10 major segments consisted of 660 didactic hours and 420 clinical hours, or a total of 1,080 hours in a 9-month period. Approximately 33 students are enrolled in each class. Detailed descriptions are not included in this paper, but the sequence of presentation and hours spent were as follows:

<i>Presentation sequence</i>	<i>Hours</i>
Anatomy and physiology.....	100
Environmental health.....	90
Medical and surgical conditions.....	285
Orthopedics .....	28
Medicine .....	40
Surgery .....	35
Urology .....	20
Dermatology .....	20
Ophthalmology .....	6
Ear, nose, throat.....	6
Dental .....	3
Obstetrics-gynecology .....	6
Psychiatry .....	6
Practical application.....	105
Review and examination.....	10
Patient care.....	330
Pharmacology .....	95
Clinical laboratory.....	75
Disaster control .....	55
Pharmacist mate responsibilities.....	20
Practical experience in surgical techniques.....	30
Total .....	1,080

*Learning techniques of eye examination*





*Student bandaging leg of patient in hospital ward. Clinical training phase of instruction lasts 8 weeks.*

Other training included emergency room duty, emergency calls, emergency ambulance trips, and emergency psychiatric calls.

The course was taught as a block system, much as in the traditional medical school curriculum.

After reviewing the teaching under the block system, we recommended the adoption of an integrated teaching method. We believe that the block teaching method provides a student with a single exposure to each unit of information without a unifying mechanism to insure his immediate and successful application to shipboard conditions. The integrated teaching method offers a unified exposure to both the academic and applied information for each subject. This exposure should improve the student's learning and retention of pertinent information in contrast with the block system, which presents the structure and function of an organ or system 3 to 6 months before the recognition and management of clinical problems are taught. This time gap alone makes it difficult for the student to correlate the material readily. It is also pertinent to note that the student has only a single exposure to the teaching of each faculty member.

The block system is in marked contrast, for example, to a traditional medical student curriculum during which the students have repeated opportunities for reviewing and recorelating the pre-

clinical and clinical disciplines. They experience even further reviews during their residencies. Probably, the integrated method would have added advantages for the marine physician's assistants because of their diverse backgrounds in education and experience when they enter this course.

The integrated curriculum presents each system of the human body as a sequential coordination of the basic and applied sciences. For example, the anatomy and physiology of an organ or system is taught in a manner that relates structure to function. This exposure is followed by discussions of the diseases common to that organ or system, to include recognition (through history, physical examination, and laboratory procedures) and management by appropriate treatments, manipulative techniques, and drugs.

The faculty is required to coordinate its respective teachings during the time provided for each system. Some faculty members are concerned because the integrated system could be more costly in both effort and time required. The benefits derived by the students, however, justify this added effort. Some sections of the course can continue to be taught by the block method, such as environmental health, disaster control, radio practice, international health, and the purser's administrative responsibilities.



Students learn routine laboratory procedures and importance of careful collection of clinical material.

After a series of discussions concerning the methods, the integrated curriculum consisting of three main phases (introduction, systems, and clinical experiences), was adopted and implemented in the 1969 class.

**Introductory background.** The initial phase, a 4-week series, includes first aid, basic biologic concepts, the metric system, care of patients, introduction to taking patient histories and physical examinations, drugs and solutions, antibiotics and anti-infectants, and medical ethics.

**Systems.** The second phase, completed in 18 weeks, has the following sequence of subject systems:

<i>System sequence</i>	<i>Weeks</i>
Dermatology .....	2
Head, eye, ear, nose, throat, and dental.....	2
Orthopedics .....	3
Cardiopulmonary .....	2
Neurology .....	2
Endocrine .....	2
Genitourinary .....	3
Digestive system.....	2

Each system is covered by several faculty members and includes appropriate exposure to anatomy and physiology, pharmacology, laboratory, common clinical conditions with associated procedures, and

direct care of patients. Diagnostic laboratory tests and management procedures are taught during specific sections of this phase. For example, during the cardiopulmonary section the student is taught microscopic examination of the blood, intravenous infusions, and management of cardiac arrest. During the genitourinary section, he is taught how to analyze urine and irrigate bladders.

**Clinical experience.** This phase lasts 8 weeks and includes instruction at each of the following locations for about 1 week: animal laboratory, operating room, medical and surgical wards, and a New York City hospital outpatient department and emergency room. Clinical experience is followed by a 2-week elective period during which the student can pick up any material he missed or on which he thought he needed additional time.

Another 3 weeks of work are interspersed in 1-week periods between clinical experience assignments. One week is devoted to each of the following: environmental health, radio practice, and miscellaneous material and safety procedures, plus related areas of health maintenance on shipboard.

Modifications were implemented in subsequent classes. Regardless of the type of curriculum, both time and experience are limited, which makes it difficult for any student to become proficient in all the technical procedures that he may be called upon



*Examining the knee joint of a skeleton*

*Stokes basket is used to transfer patient between vessels at sea. Students practice securing a patient.*



to perform. The preparation of filmstrips has been recommended for shipboard use to provide the marine physician's assistant with a step-by-step review of the therapeutic and management procedures.

#### **Performance of Graduates**

We interviewed 24 of the 55 graduates of the program and visited several merchant vessels for general information. In addition, we examined a number of medical logs. From this largely subjective review, it was apparent that the performance of the marine physician's assistant has been commendable and that knowledge learned in the course has been well applied. However, we recommend a more objective evaluation of shipboard performance through discussions with masters, crew, and shipping company medical directors and a critical review of medical logs.

#### **Continuing Education**

The health of the crew on shipboard and of those in the port of entry is contingent upon the maintenance of high performance levels of the marine physician's assistant. We believe a program of continuing education that includes a method of evaluating his performance is imperative. Continuing education and evaluation, in addition to insuring high levels of individual performance, can serve as a communications mechanism among the marine physician's assistants.

Administration and organization of such a program could be comparable to an alumni association of academic institutions. The coordinator-instructor of the school could assume this responsibility because he is acquainted with each student during his stay at the school, has direct access to the Staff Officers' Association, maintains a file of current addresses of graduates, and keeps abreast of new academic and administrative developments. The purposes of this program are to maintain the qualifications of the school's graduates and to assure quality control of their performance through refresher courses at the school, a regular newsletter, and other means devised through the continual evaluation of the program.

#### **Discussion**

Our observations, based on discussions with members of the Public Health Service and the Staff Officers' Association, interviews with graduates, and review of the course content, revealed that the plan, the faculty, and the course were satisfactorily meeting the objectives of the program. An early and incomplete evaluation also revealed that the quality of the practicing graduates was satisfactory.

This program is relevant to contemporary and future systems of American medical services. The United States already has large numbers of trained health assistants working in private offices and most



*Students assist in operating room during their clinical experience phase.*

medical institutions. Although their contribution is essential to the functioning of existing subsystems of health care, the complexities of modern health services require persons with more formal education and training to serve in some medical and health functions. Thus in addition to the obvious benefits derived from the performance of marine physician's assistants, the education and training program could well serve as an example for the formal preparation of other health personnel both in this country and abroad.

Important as the methods of instruction are, control of the medical practices of marine physician's assistants is equally significant. Experiences with other medical assistants, both abroad and in the U.S. Armed Forces, generate concern that these skills in nonprofessional hands can be abused or exploited.

The marine physician's assistants function in a controlled system that has few of the potential problems inherent in an open civilian system. The marine system, because of its limited scope in dealing only with seamen, provides its own best controls. Job security, salary incentives, retirement, and other fringe benefits are sufficiently rewarding that the assistant will neither be tempted to perform beyond the level of his knowledge nor apply his expertise in nonshipboard situations. An additional safeguard is the radio consultation program, which offers the

marine physician's assistant direct and continuing contact with qualified physicians. It is essential that this or a like system of control be maintained to prevent the graduates of this and similar programs from entering into some form of unsupervised health practice, such as medically treating patients without proper licensure.

The opinion of the teaching faculty concerning the integrated curriculum that has been developed and implemented, based on comparable examination results and daily observation of performance, is that a definite improvement has occurred both in the amount of knowledge acquired and in the effectiveness of its application through the use of the integrated teaching system.

We shall continue to monitor and evaluate this integrated curriculum model as an important experiment in the education and training of medical and health assistants. We are not aware that this curriculum method is being applied elsewhere in training medical assistants. The alarming shortage of medical personnel, particularly physicians, is the continuing topic of articles in all health-related journals and the press. One method of extending the usefulness of the physician is the physician's assistant. The Marine Physician Assistant Program can provide the expertise necessary to counsel and guide training programs of this kind and indeed may itself be replicated to great advantage.