NONRESIDENT TRAINING COURSE

August 2000

Hospital Corpsman

NAVEDTRA 14295

NOTICE

Pages 1-29, 1-30, 7-15, and 7-20
must be printed on a
COLOR printer.

Although the words "he," "him," and "his" are used sparingly in this course to enhance communication, they are not intended to be gender driven or to affront or discriminate against anyone.

PREFACE

By enrolling in this self-study course, you have demonstrated a desire to improve yourself and the Navy. Remember, however, this self-study course is only one part of the total Navy training program. Practical experience, schools, selected reading, and your desire to succeed are also necessary to successfully round out a fully meaningful training program.

THE COURSE: This self-study course is organized into subject matter areas, each containing learning objectives to help you determine what you should learn along with text and illustrations to help you understand the information. The subject matter reflects day-to-day requirements and experiences of personnel in the rating or skill area. It also reflects guidance provided by Enlisted Community Managers (ECMs) and other senior personnel, technical references, instructions, etc., and either the occupational or naval standards, which are listed in the *Manual of Navy Enlisted Manpower Personnel Classifications and Occupational Standards*, NAVPERS 18068.

THE QUESTIONS: The questions that appear in this course are designed to help you understand the material in the text.

VALUE: In completing this course, you will improve your military and professional knowledge. Importantly, it can also help you study for the Navy-wide advancement in rate examination. If you are studying and discover a reference in the text to another publication for further information, look it up.

THANKS: A special note of thanks is given to the following activities and their staffs for providing valuable information during the preparation of this course: Bureau of Medicine and Surgery, Washington, DC; Navy Environmental Health Center, Norfolk, Virginia; and Naval Hospital, Pensacola, Florida.

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Sailor's Creed

"I am a United States Sailor.

I will support and defend the Constitution of the United States of America and I will obey the orders of those appointed over me.

I represent the fighting spirit of the Navy and those who have gone before me to defend freedom and democracy around the world.

I proudly serve my country's Navy combat team with honor, courage and commitment.

I am committed to excellence and the fair treatment of all."

TABLE OF CONTENTS

INSTRUCTIONS FOR TAKING THE COURSE

ASSIGNMENTS

The text pages that you are to study are listed at the beginning of each assignment. Study these pages carefully before attempting to answer the questions. Pay close attention to tables and illustrations and read the learning objectives. The learning objectives state what you should be able to do after studying the material. Answering the questions correctly helps you accomplish the objectives.

SELECTING YOUR ANSWERS

Read each question carefully, then select the BEST answer. You may refer freely to the text. The answers must be the result of your own work and decisions. You are prohibited from referring to or copying the answers of others and from giving answers to anyone else taking the course.

SUBMITTING YOUR ASSIGNMENTS

To have your assignments graded, you must be enrolled in the course with the Nonresident Training Course Administration Branch at the Naval Education and Training Professional Development and Technology Center (NETPDTC). Following enrollment, there are two ways of having your assignments graded: (1) use the Internet to submit your assignments as you complete them, or (2) send all the assignments at one time by mail to NETPDTC.

Grading on the Internet: Advantages to Internet grading are:

- you may submit your answers as soon as you complete an assignment, and
- you get your results faster; usually by the next working day (approximately 24 hours).

In addition to receiving grade results for each assignment, you will receive course completion confirmation once you have completed all the assignments. To submit your assignment answers via the Internet, go to:

http://courses.cnet.navy.mil

Grading by Mail: When you submit answer sheets by mail, send all of your assignments at one time. Do NOT submit individual answer sheets for grading. Mail all of your assignments in an envelope, which you either provide yourself or obtain from your nearest Educational Services Officer (ESO). Submit answer sheets to:

COMMANDING OFFICER
NETPDTC N331
6490 SAUFLEY FIELD ROAD
PENSACOLA FL 32559-5000

Answer Sheets: All courses include one "scannable" answer sheet for each assignment. These answer sheets are preprinted with your SSN, name, assignment number, and course number. Explanations for completing the answer sheets are on the answer sheet.

Do not use answer sheet reproductions: Use only the original answer sheets that we provide—reproductions will not work with our scanning equipment and cannot be processed.

Follow the instructions for marking your answers on the answer sheet. Be sure that blocks 1, 2, and 3 are filled in correctly. This information is necessary for your course to be properly processed and for you to receive credit for your work.

COMPLETION TIME

Courses must be completed within 12 months from the date of enrollment. This includes time required to resubmit failed assignments.

PASS/FAIL ASSIGNMENT PROCEDURES

If your overall course score is 3.2 or higher, you will pass the course and will not be required to resubmit assignments. Once your assignments have been graded you will receive course completion confirmation.

If you receive less than a 3.2 on any assignment and your overall course score is below 3.2, you will be given the opportunity to resubmit failed assignments. **You may resubmit failed**

assignments only once. Internet students will receive notification when they have failed an assignment--they may then resubmit failed assignments on the web site. Internet students may view and print results for failed assignments from the web site. Students who submit by mail will receive a failing result letter and a new answer sheet for resubmission of each failed assignment.

COMPLETION CONFIRMATION

After successfully completing this course, you will receive a letter of completion.

ERRATA

Errata are used to correct minor errors or delete obsolete information in a course. Errata may also be used to provide instructions to the student. If a course has an errata, it will be included as the first page(s) after the front cover. Errata for all courses can be accessed and viewed/downloaded at:

http://www.cnet.navy.mil/netpdtc/nac/neas.htm

STUDENT FEEDBACK QUESTIONS

We value your suggestions, questions, and criticisms on our courses. If you would like to communicate with us regarding this course, we encourage you, if possible, to use e-mail. If you write or fax, please use a copy of the Student Comment form that follows this page.

For subject matter questions:

E-mail: n313.products@cnet.navy.mil
Phone: Comm: (850) 452-1001, Ext. 2167
DSN: 922-1001, Ext. 2167
FAX: (850) 452-1370
(Do not fax answer sheets.)
Address: COMMANDING OFFICER
NETPDTC (CODE N313)
6490 SAUFLEY FIELD ROAD
PENSACOLA FL 32509-5000

For enrollment, shipping, grading, or completion letter questions

E-mail: fleetservices@cnet.navy.mil
Phone: Toll Free: 877-264-8583
Comm: (850) 452-1511/1181/1859
DSN: 922-1511/1181/1859
FAX: (850) 452-1370
(Do not fax answer sheets.)
Address: COMMANDING OFFICER
NETPDTC (CODE N331)
6490 SAUFLEY FIELD ROAD
PENSACOLA FL 32559-5000

NAVAL RESERVE RETIREMENT CREDIT

If you are a member of the Naval Reserve, you will receive retirement points if you are authorized to receive them under current directives governing retirement of Naval Reserve personnel. For Naval Reserve retirement, this course is evaluated at 14 points: 12 points upon satisfactory completion of unit 1, assignments 1-8; and 2 points upon satisfactory completion of unit 2, assignment 9. (Refer to *Administrative Procedures for Naval Reservists on Inactive Duty*, BUPERSINST 1001.39, for more information about retirement points.)

COURSE OBJECTIVES

In completing this nonresident training course, you will demonstrate a knowledge of the subject matter by correctly answering questions on the following subjects: anatomy and physiology; fundamentals of patient care; first aid equipment, supplies, rescue, and transportation; emergency medical care procedures; poisoning, drug abuse, and hazardous material exposure; pharmacy and toxicology; clinical laboratory; medical aspects of chemical, biological, and radiological warfare; diet and nutrition; emergency dental care; preventive medicine; physical examinations; health records; supply; administration; healthcare administration; and decedent affairs.

Student Comments

Course Title: *Hospital Corpsman*

NAVEDTRA: 14295 **Date**: _____

We need some information about you:

Rate/Rank and Name: _____ SSN: _____ Command/Unit _____

Street Address: _____ City: _____ State/FPO: _____ Zip _____

Your comments, suggestions, etc.:

Privacy Act Statement: Under authority of Title 5, USC 301, information regarding your military status is requested in processing your comments and in preparing a reply. This information will not be divulged without written authorization to anyone other than those within DOD for official use in determining performance.

NETPDTC 1550/41 (Rev 4-00)

CHAPTER 1

ANATOMY AND PHYSIOLOGY

Knowledge of how the human body is constructed and how it works is an important part of the training of everyone concerned with healing the sick or managing conditions following injury. This chapter will provide you with a general knowledge of the structures and functions of the body.

The human body is a combination of organ systems, with a supporting framework of muscles and bones and an external covering of skin. The study of the body is divided into three sciences:

Anatomy—the study of body structures and the relation of one part to another.

Physiology—the study of the processes and functions of the body tissue and organs. Physiology is the study of how the body works and how the various parts function individually and in relation to each other.

Embryology—the study of the development of the body from a fertilized egg, or ovum.

TERMS OF POSITION AND DIRECTION

LEARNING OBJECTIVE: *Identify anatomical terms of position and direction.*

The planes of the body are imaginary lines dividing it into sections. These planes are used as reference points in locating anatomical structures. As shown in figure 1-1, the **median**, or **midsagittal**, **plane** divides the body into right and left halves on its vertical axis. This plane passes through the sagittal suture of the cranium; therefore, any plane parallel to it is called a **sagittal plane**. **Frontal planes** are drawn perpendicular to the sagittal lines and divide the body into anterior (front) and posterior (rear) sections. Since this line passes through the coronal suture of the cranium, frontal planes are also called **coronal planes**. The **horizontal**, or **transverse**, **plane**, which is drawn at right angles to both sagittal and frontal planes, divides the body into superior (upper) and inferior (lower) sections.

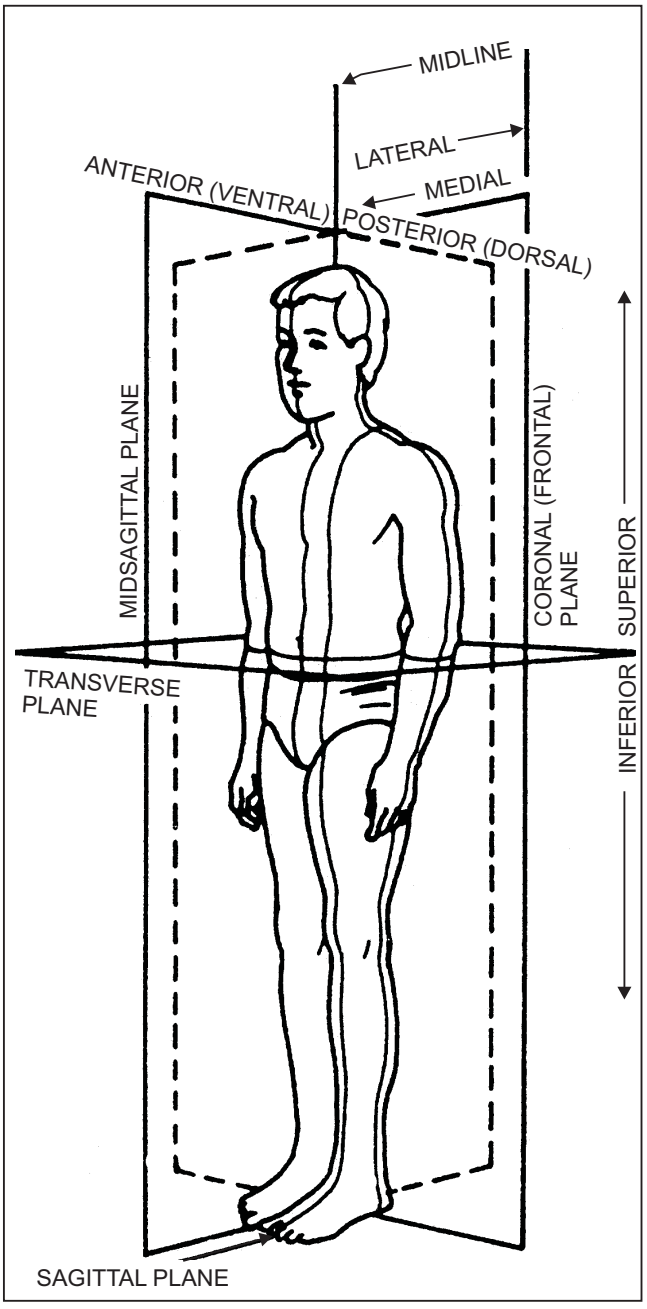

Figure 1-1.—Planes of the body.

To aid in understanding the location of anatomical structures, you should use a standard body position called the **anatomical position** as a point of reference. This anatomical position is assumed when the body

stands erect with the arms hanging at the sides and the palms of the hands turned forward (fig. 1-2).

Other commonly used anatomical terms include the following:

Anterior or ventral—toward the front, or ventral (pertaining to the belly; abdomen), side of the body.

Posterior or dorsal—toward the back, or rear, side of the body.

Medial—near or toward the midline of the body.

Lateral—farther away from the midline of the body.

Internal—inside.

External—outside.

Proximal—nearer the point of origin or closer to the body.

Distal—away from the point of origin or away from the body.

Superior—higher than or above.

Cranial—toward the head.

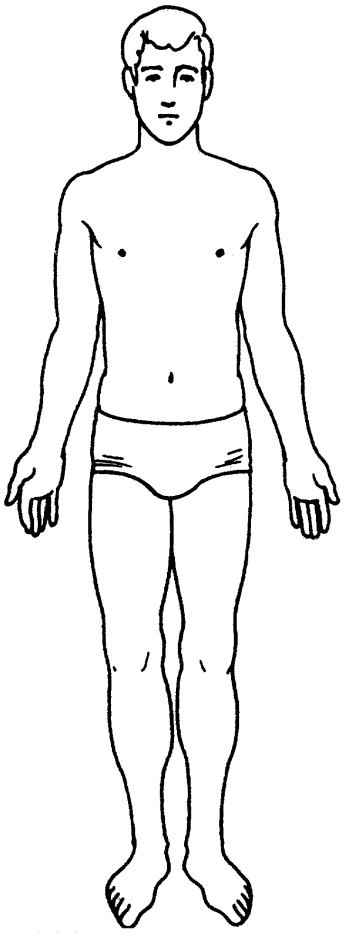

Figure 1-2.—Anatomical position.

Caudal—toward the lower end of the body.

Inferior—lower than or below.

Erect—normal standing position of the body.

Supine—lying position of the body, face up.

Prone—lying position of the body, face down.

Lateral recumbent—lying position of the body on either side.

Peripheral—the outward part or surface of a structure.

CHARACTERISTICS OF LIVING MATTER

LEARNING OBJECTIVE: *Identify the characteristics of living matter.*

All living things, animals and plants, are organisms that undergo chemical processes by which they sustain life and regenerate cells. The difference between animals and plants is that animals have sensations and the power of voluntary movement, and they require oxygen and organic food. On the other hand, plants require only carbon dioxide and inorganic matter for food and have neither voluntary movement nor special sensory organs.

In man, some of the characteristic functions necessary for survival include **digestion**, **metabolism**, and **homeostasis**. Digestion involves the physical and chemical breakdown of the food we eat into its simplest forms. Metabolism is the process of absorption, storage, and use of these foods for body growth, maintenance, and repair. Homeostasis is the body's self-regulated control of its internal environment. It allows the organism to maintain a state of constancy or equilibrium, in spite of vast changes in the external environment.

THE CELL

LEARNING OBJECTIVE: *Identify the parts of the cell and their functions.*

The cell, the smallest unit of life, is the basic structural unit of all living things and a functional unit all by itself. Cells are composed of a viscid, jellylike substance, called **protoplasm**, upon which depend all the vital functions of nutrition, secretion, growth,

circulation, reproduction, excitability, and movement. Protoplasm, thus, has often been called "the secret of life."

A typical cell is made up of the plasma membrane, the nucleus, and the cytoplasm.

The **plasma membrane** is a selectively permeable membrane surrounding the cell. In addition to holding the cell together, the membrane selectively controls the exchange of materials between the cell and its environment by physical and chemical means. Gases (such as oxygen) and solids (such as proteins, carbohydrates, and mineral salts) pass through the plasma membrane by a process known as **diffusion**.

The **nucleus** is a small, dense, usually spherical body that controls the chemical reactions occurring in the cell. The substance contained in the nucleus is called **nucleoplasm**. The nucleus is also important in the cell's reproduction, since genetic information for the cell is stored there. Every human cell contains 46 chromosomes, and each chromosome has thousands of genes that determine the cell's function.

The **cytoplasm** is a gelatinous substance surrounding the nucleus and is contained by the plasma membrane. The cytoplasm is composed of all of the cell protoplasm except the nucleus.

The simplest living organism consists of a single cell. The amoeba is a unicellular animal. The single cell of such a one-celled organism must be able to carry on all processes necessary for life. This cell is called a **simple** or **undifferentiated cell**, one that has not acquired distinguishing characteristics.

In multicellular organisms, cells vary in size, shape, and number of nuclei. When stained, the various cell structures can be more readily recognized under a microscope. Other differences such as the number and type of cells can be seen with the aid of a microscope. Many cells are highly specialized. **Specialized cells** perform special functions (e.g., muscle cells, which contract, and epithelial cells, which protect the skin).

TISSUES

LEARNING OBJECTIVES: *Identify the types of tissues in the human body and their functions.*

Tissues are groups of specialized cells similar in structure and function. They are classified into four main groups: epithelial, connective, muscular, and nervous.

EPITHELIAL TISSUE

The lining tissue of the body is called **epithelium**. It forms the outer covering of the body known as the free surface of the skin. It also forms the lining of the digestive, respiratory, and urinary tracts; blood and lymph vessels; serous cavities (cavities which have no communication with the outside of the body, and whose lining membrane secretes a serous fluid), such as the peritoneum or pericardium; and tubules (small tubes which convey fluids) of certain secretory glands, such as the liver and kidneys. Epithelial tissues are classified according to their shape, arrangement, and the function of their cells. For example, epithelial tissues that are composed of single layers of cells are called "simple," while cells with many layers are said to be "stratified." In the following paragraphs we will discuss the three categories of epithelial tissue: columnar, squamous, and cuboidal.

Columnar Epithelial Tissue

Epithelial cells of this type are elongated, longer than they are wide. Columnar tissue is composed of a single layer of cells whose nuclei are located at about the same level as the nuclei in their neighboring cells (fig. 1-3). These cells can be located in the linings of the uterus, in various organs of the digestive system, and in the passages of the respiratory system. In the digestive system, the chief function of columnar tissue is the secretion of digestive fluids and the absorption of nutrients from digested foods. In certain areas (such as the nostrils, bronchial tubes, and trachea), this tissue has a crown of microscopic hairlike processes known as **cilia**. These cilia provide motion to move secretions

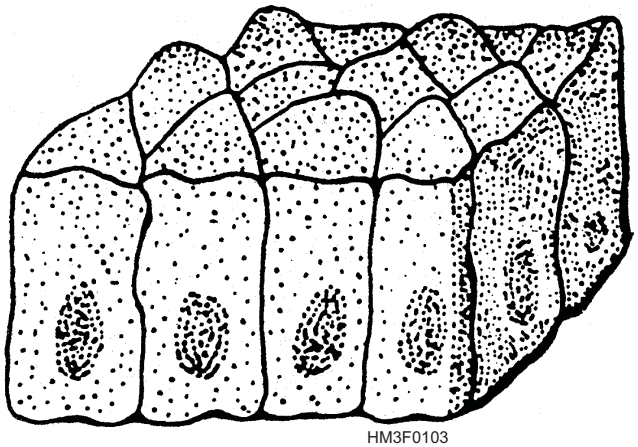

Figure 1-3.—Columnar epithelial tissue.