

Workbook for **EMERGENCY CARE IN THE STREETS**

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LITTLE, BROWN AND COMPANY, BOSTON

03817
F-22

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First Edition
Sixth Printing

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Library of Congress Catalog Card No. 79-88163

ISBN 0-316-54484-1

Printed in the United States of America

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INTRODUCTION

This workbook is designed to accompany *Emergency Care in the Streets* (Little, Brown, 1979), by Nancy L. Caroline, M.D. Both the workbook and text have been prepared to correspond to the United States Department of Transportation's "Training Program for the Emergency Medical Technician-Paramedic." Each is organized with similar chapter and topic titles for easy cross-reference. The two books in combination provide an excellent resource both for students participating in a paramedic training program and for those involved in the provision of emergency care.

Each chapter of the workbook consists of a goal statement, a summary of the chapter in the form of review statements, and review questions. Each review statement outlines a concept or piece of information presented in the text. The questions are accompanied by reference numbers to the review statements (e.g., item 20). You will find the review statements helpful when answering the questions, studying for examinations, or reviewing to refresh your memory.

The pages of the workbook are perforated so that an instructor of a training program can use the review questions as assignments to be submitted by the students.

To get the maximum benefit from the text and workbook, you should proceed as follows: First, in the workbook, read the goal statement found at the beginning of the chapter and skim the review questions found at the end. These emphasize the important concepts of the chapter. Then read the corresponding chapter in the text. After reading the text, you may wish to read the review statements to refresh your memory or you may proceed directly to the review questions. Try to answer each question, and check your response against the answer provided in the back of the workbook. If your answer is incorrect or incomplete, read the review statements in the workbook that apply to the question and reread the appropriate section of the text. The review statement provides a summary of the information or concept addressed by the question, and the text provides a detailed discussion. After reviewing the material, try to answer the question again. If the concept is still not clear, make a note in the workbook to ask your instructor, training coordinator, or medical director to explain it further.

WORKBOOK FOR EMERGENCY CARE IN THE STREETS

NOTICE

The indications and dosages of all drugs in this book have been recommended in the medical literature and conform to the practices of the general medical community. The medications described do not necessarily have specific approval by the Food and Drug Administration for use in the diseases and dosages for which they are recommended. The package insert for each drug should be consulted for use and dosage as approved by the FDA. Because standards for usage change, it is advisable to keep abreast of revised recommendations, particularly those concerning new drugs.

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ROLE OF THE PARAMEDIC

Goal: After reading this chapter, the student should be able to list the role and responsibilities of the paramedic and should have an understanding of the laws that govern the paramedic.

REVIEW OF THE CHAPTER

ROLE OF THE PARAMEDIC (EMT-ADVANCED)

1. A *paramedic* is a health care professional who has well-defined skills and knowledge in emergency medicine and who is concerned for the health and well-being of others.
2. In his personal conduct, the paramedic must remain in complete control of himself in emergency situations.
3. Paramedics have a responsibility to the community to teach lay persons and other health professionals the fundamentals of prehospital care.
4. A paramedic must have a special relationship with the medical director in charge of his service. This relationship is based upon earned mutual trust and respect.

EMERGENCY MEDICAL SERVICES SYSTEM

5. An emergency medical services (EMS) system has the following components: *recognition* of the emergency; *initiation* of response (by phone or radio); *treatment at the scene*; *transportation with life support*; treatment in the *emergency department*; treatment in the *operating room*; treatment in *intensive care*; *organization and communication*; *planning, education, evaluation*; and *research*.

LAWS GOVERNING THE PARAMEDIC

6. In most regions, emergency medical technicians are enabled to function through the provisions of a *Medical Practice Act*.
7. A Medical Practice Act usually defines the minimum qualifications of health professionals.
8. Most states have a *Good Samaritan Act*, which protects physicians (and others) from legal action resulting from participation in emergency treatment.
9. Good Samaritan Acts do not protect the individual from liability for *negligence*.
10. In order to prove negligence, a person must usually demonstrate that an injury happened, that the accused had a *duty to act*, that the accused failed to act as another prudent person would in the same situation, and that failure to take appropriate action caused the injury.
11. Ambulance providers that *do not* accept remuneration (such as public,

- municipal, and volunteer services) are obligated under duty-to-act legislation to render aid to all patients in their jurisdiction.
12. The rendering of emergency medical care requires *consent* of the patient. Any touching of a patient's body without the patient's consent may result in charges of assault and battery.
 13. *Consent* means that the patient must be *informed* of the nature and extent of the procedures to be performed and the possible risks involved.
 14. In the unconscious adult, consent for emergency life support is said to be *implied*.
 15. In the case of children or mentally incompetent adults, consent must be obtained from a guardian.
 16. If consent is refused (for any reason) by a conscious and mentally competent adult, the patient cannot be treated without a court order.
 17. Generally speaking, a police officer is the only individual who is authorized to restrain and transport a person against his will.
 18. *Abandonment* refers to the termination by the physician, and by extension the paramedic, of a physician-patient relationship without consent of the patient and without allowing the patient time to locate another physician (assuming that the patient needs continued medical treatment and that the termination of treatment was a cause of subsequent injury).
 19. *Delegated practice* refers to the delegation of authority by the physician to another person to carry out actions for the physician. Such actions are still considered, by law, actions of the physician. For this reason, the paramedic's activities cannot be carried out without orders from a licensed physician. Orders may be given by radio or defined by protocols.
 20. Accurate and detailed *medical records* are a paramedic's best protection in legal proceedings.
 21. Medical records should contain at least *date and times, patient history, observations* at the scene, findings of the *physical examination*, detailed description of *treatment*, and any *changes* in the patient's status.

ISSUES CONCERNING THE HEALTH PROFESSIONAL

22. *Medical ethics* requires that the paramedic place the welfare of the patient above all other considerations.
23. By understanding his own feelings about *death and suffering*, the paramedic will be better able to deal with the feelings of others.

NAME:	DATE:
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- REVIEW QUESTIONS**
1. Define in your own words the term *paramedic*. (item 1)
 2. What responsibility does the paramedic have to each of the following? (items 3 and 4)
 - a. Community
 - b. Medical director
 3. List the 10 components of the emergency medical services (EMS) system. (item 5)
 4. Match the following legal concepts with the appropriate descriptions. (items 6–19)

Concepts

 - A. Medical Practice Act
 - B. Good Samaritan Act
 - C. Negligence
 - D. Duty to act
 - E. Consent
 - F. Implied consent
 - G. Abandonment
 - H. Delegated practice

Descriptions

 - ___ Acceptance of treatment by the patient (or his guardian)
 - ___ Abrupt termination by the physician (or paramedic) of the physician-patient relationship when the patient is still in need of medical attention
 - ___ Obligation to provide service to every patient who needs it
 - ___ Failure to act as another prudent individual would in the same situation when this failure to act results in injury
 - ___ Assumption when giving lifesaving treatment to an unconscious adult
 - ___ Definition of the minimum qualifications of health professionals
 - ___ Protection from liability when participating in emergency treatment
 - ___ Actions carried out on the orders of a physician
 5. You have arrived at the scene of an automobile accident. A patient is bleeding severely but is conscious and mentally competent. He refuses medical treatment on religious grounds. Describe how you would manage this situation. (item 16)

4 ROLE OF THE PARAMEDIC

6. Place a *T* beside the statement if it is true and an *F* if it is false.
- ___ a. To treat a child, consent must be obtained from a guardian. (item 15)
 - ___ b. A paramedic has the legal right to transport a patient against his will. (item 17)
 - ___ c. A conscious and mentally competent adult who refuses to give consent can be treated only by authorization of a court order. (item 16).
 - ___ d. Patients must be informed of what is going to be done to them. (item 13)
7. Medical records are often involved in court cases. List the minimum information that should be included in your medical records. (item 21)
8. List at least four things a person must demonstrate to prove negligence. (item 10)
9. What is the paramedic's best protection in the event of legal proceedings? (item 20)

HUMAN SYSTEMS AND PATIENT ASSESSMENT

Goal: After reading this chapter, the student should be able to name the human systems, describe their function(s), and identify their anatomic parts. In addition, the student should know the principles of taking a patient history, performing a physical examination, and communicating this information to the physician.

REVIEW OF THE CHAPTER

MEDICAL TERMINOLOGY

1. Knowledge of the meanings of prefixes and suffixes can help in determining the meaning of many medical terms (e.g., nephrectomy is derived from the prefix *nepbro-*, meaning “kidney,” and the suffix *-ectomy*, meaning “surgical removal”).

OVERVIEW OF ANATOMY AND PHYSIOLOGY

2. *Anatomy* refers to the structure of an organism, while *physiology* refers to the function of an organism.

The Cell

3. The cell is composed chiefly of water that has suspended in it minerals, proteins, fats (lipids), carbohydrates, and nucleic acids (DNA and RNA).
4. The cell performs the following tasks: production of energy (breakdown of carbohydrates, fats, and proteins), exchange of materials, synthesis of structural materials, and reproduction.
5. Among the waste products given off in the production of energy and heat are carbon dioxide, lactic acid, ketones, and urea.
6. A *tissue* is a collection of cells of a specific type to carry out a specific function.
7. Four main types of tissue are *epithelial* (covering the outer surface of the body and surfaces of internal organs), *connective* (e.g., fat tissue, tendons, ligaments), *muscle* (e.g., skeletal muscles, blood vessel walls, bladder), and *nerve*.
8. All tissues in the body work together to achieve *homeostasis* (stability); e.g., as body heat production increases, blood vessels near the surface of the skin dilate, and the blood cools.

The Language of Anatomy

9. The regions of the body are head, neck, trunk (including thorax and abdomen), and extremities.
10. *Locations* can be denoted as *anterior* (toward the front of the body),

posterior (toward the back of the body), *superior* (upper), *inferior* (lower), *superficial* (near the surface), *deep* (remote from the surface), *internal* (inside), *external* (outside), *proximal* (part nearest the heart), *distal* (part farthest from the heart), *medial* (toward the center of the body), and *lateral* (away from the center of the body).

11. Terms relating to *direction* are *cranial* or *cephalad* (toward the head) and *caudad* (toward the feet).
12. Terms relating to *position and movement* are *supine* (face up), *prone* (face down), *abduction* (movement away from the body), *adduction* (movement toward the body), *flexion* (the act of bending), and *extension*, (movement toward a straight condition).

The Body Scaffolding: The Skeleton

13. The skeletal system is composed of *bones*, *cartilage*, and *ligaments*.
14. The types of *joints* (articulation of two bones) are fused (those in the skull) and synovial (those having articular surfaces covered with cartilage and separated by an articular cavity filled with synovial fluid, a lubricant).
15. *Synovial joints* include hinge (e.g., fingers), ball-and-socket (e.g., hip or shoulder), pivot (e.g., between the radius and ulna), and gliding (e.g., those between the bones of the hand).
16. The *skull* contains the cranial bones (e.g., frontal and occipital), upper jaw (maxilla), lower jaw (mandible), and cheek bones (zygomata).
17. The *spinal column* (composed of 26 bones called vertebrae) serves as the main axis of the body and as a protective case for the spinal cord and roots of the spinal nerves.
18. The spine is divided into five sections: cervical spine, in the neck region (first 7 vertebrae); thoracic spine, in the upper back (12 vertebrae); lumbar spine, in the lower back (5 vertebrae); sacrum; and coccyx (tail bone).
19. Each *vertebra* consists of a body (the solid portion), a vertebral arch (pedicle, spinous process, and transverse process) and a vertebral foramen (opening through which the spinal cord passes).
20. Vertebrae are separated from one another by intervertebral discs.
21. The *thorax* (rib cage) consists of the 12 ribs (including the floating ribs), the sternum (breast bone), and costal cartilages.
22. The *upper extremities* consist of the bones of the shoulder girdle (two scapulae and two clavicles), arms (humerus), forearms (radius and ulna), and hands (carpals, the wrist bones; metacarpals, the hand bones; and phalanges, the finger bones).
23. The *lower extremities* consist of the bones of the pelvis (ischium, ilium, and pubis), upper legs (femur), lower legs (tibia and fibula), and feet (tarsals, metatarsals, and phalanges).

The Moving Force: Muscles

24. The three types of muscles are striated (skeletal), smooth, and cardiac.
25. *Skeletal (striated) muscles* are attached to various bones by tough cords called *tendons*.
26. Most skeletal muscles are voluntary muscles; i.e., they are under voluntary control.
27. *Smooth muscles*, or involuntary muscles, are found in internal organs, such as the wall of the digestive tract, the trachea and bronchi, the urinary bladder, and the blood vessels.

28. *Cardiac muscle* is found only in the heart and has the ability to initiate its own contraction (*automaticity*).
29. Muscle contraction requires energy obtained from metabolism. Only one-third of the energy is used in the performance of work; the rest is given up in the form of heat.
30. Muscle dysfunction can occur from injury, illness, deprivation of nutrients and oxygen, or damage to the nerves supplying the muscle, to the spinal cord, or to the brain.

The Executive Branch: The Nervous System

31. The nervous system is divided into two parts: the *central nervous system* (the brain and spinal cord) and the *peripheral nervous system* (comprising the peripheral sensory and motor nerves).
32. The nervous system is subdivided functionally into the *autonomic* (involuntary) component and the *voluntary* component.
33. The *brain* serves as the regulatory center, the center of sensations, the seat of consciousness, the source of voluntary acts, the seat of the emotions, and the source of higher mental processes.
34. The brain is enclosed by three membranes: pia mater (innermost membrane), arachnoid membrane (outside the pia mater), and dura mater (outermost layer).
35. The brain and the spinal cord are surrounded by a clear, colorless fluid called *cerebrospinal fluid* (CSF). Cerebrospinal fluid serves as a cushion to protect the brain and as a source of nutrition.
36. The brain consists of three regions: cerebral cortex, cerebellum, and brainstem (containing the medulla).
37. The *spinal cord* has two functions: It serves as a conducting pathway (carrying messages to and from the brain) and as a reflex center (e.g., mediating knee jerk).
38. The *autonomic nervous system* is composed of the *parasympathetic* nervous system, which controls vegetative functions (e.g., basal heart rate), and the *sympathetic* nervous system, which enables the body to increase overall activity during fear or stress.

Distribution: The Circulatory System

39. The circulatory system is subdivided into the *blood-vascular system* (heart and blood vessels) and the *lymphatic system*.
40. Blood passes through the following structures, in the following order: venae cavae, right atrium, tricuspid valve, right ventricle, pulmonary valve, pulmonary arteries, lungs, pulmonary veins, left atrium, mitral valve, left ventricle, aortic valve, and aorta (to all parts of the body).
41. The heart is enclosed in a double-walled sac, the *pericardium*; the inner layer is called the visceral pericardium and the outer layer is called the parietal pericardium. Between the two layers is pericardial fluid, a lubricant.
42. The major *arteries* (conducting blood away from the heart) are the aorta, carotids (supplying the head and neck), brachials (supplying the upper extremities), and femorals (supplying the lower extremities).
43. The two major *veins* (conducting blood to the heart) are the inferior vena cava (from the lower extremities) and superior vena cava (from the head, neck, shoulders, and upper extremities).
44. *Capillaries* are tiny, thin-walled vessels.

45. The *pulmonary circulation* includes those blood vessels that carry blood from the right heart to the lungs and back to the heart.
46. The *systemic circulation* comprises those blood vessels that carry blood through the rest of the body.
47. *Pulse* is the beat of the heart felt over arteries, usually detected in large arteries near the surface of the skin (e.g., carotid pulse, radial pulse, and femoral pulse).
48. *Blood pressure* (the force exerted on the walls of arteries by repeated contractions of the left ventricle) is determined by the force of the heart beat, the volume of blood in the vascular system, and the degree of constriction of the blood vessels.
49. *Blood* consists of plasma, red blood cells (erythrocytes) containing hemoglobin, white blood cells (leukocytes), and platelets.
50. The *lymphatic system* carries lymph, fluid that has filtered out of the capillaries and into the tissues. Plasma volume is constantly replenished with fluid retrieved from the tissues by the lymphatic system.

Keeping the Fires Burning: The Respiratory System

51. The functions of the respiratory system are to ensure an adequate supply of oxygen for metabolic processes and to eliminate volatile waste products, chiefly carbon dioxide.
52. Air enters the nose and mouth and passes into the pharynx (throat), over the epiglottis (a flap that prevents food from entering the larynx), into the larynx (voice box), through the trachea and main bronchi, and finally into the lungs.
53. *Alveoli* are tiny air spaces in the lungs that are wrapped with pulmonary capillaries. At the interface between the alveoli and the pulmonary capillaries, blood is oxygenated and carbon dioxide is given off.
54. The breathing process is controlled by the *respiratory center*, which is in the medulla. That center stimulates the respiratory muscles if the carbon dioxide level in arterial blood rises above normal.

Fuel Processing: The Digestive System

55. The digestive system consists of the mouth, salivary glands, pharynx, esophagus, stomach, intestines, liver, gallbladder, and pancreas.
56. Solid food must be propelled down the esophagus by rhythmic muscular contractions called *peristalsis*.
57. The organs in the digestive system mechanically (e.g., by chewing and peristaltic movements) and chemically (e.g., by using gastric juices containing acid and enzymes) break down food so that it can be absorbed into the cells.
58. The pancreas, in addition to its role in digestion, secretes the hormone *insulin*, which is necessary for the utilization of glucose.

Plumbing: The Urinary System

59. The urinary system controls the production and elimination of urine and consists of the kidneys, excretory passages (ureters and urethra), and bladder.
60. The urinary system has the following functions: elimination of toxic substances and waste products, maintenance of salt and water balances, and maintenance of acid-base balance.
61. In the kidneys, waste products are filtered out and urine is formed.
62. The bladder stores the urine until about 300 ml has collected, at which time the urge to void is felt.

Perpetuation of the Species: The Reproductive System

63. The *male reproductive system* consists of the testes, a duct system, accessory glands (prostate), and the penile urethra.
64. The *testes* produce male hormones, seminal fluid, and sperm cells.
65. The *female reproductive system* is made up of the ovaries, fallopian tubes, uterus, vagina, and external genitalia.

Remote Control: The Endocrine System

66. Bodily activity is controlled by the nervous system and through chemicals, or *hormones*, secreted by *endocrine glands*.
67. The endocrine glands include the pituitary gland (controls other endocrine glands), thyroid gland (regulates metabolic rate), parathyroid glands (control metabolism of calcium and phosphorus), adrenal glands (manufacture steroids and catecholamines, such as epinephrine), endocrine pancreas (produces insulin), and ovaries (secrete female sex hormones) and testes (secrete male sex hormones).

PATIENT ASSESSMENT

68. The paramedic is the eyes, ears, and hands of the physician; thus, the paramedic must develop the skills of taking a medical history, performing a physical examination, and communicating this information to the physician.

The Overall Approach

69. The *purposes of history-taking* and the *physical examination* are to win the patient's confidence, to identify rapidly the patient's problem and establish priorities for treatment, and to obtain information about the patient that may not be readily available to those caring for him in the hospital (e.g., by observing the patient's environment).
70. Both the history and the physical examination should be *orderly* (systematic) and *thorough*.
71. The field situation dictates which is done first, the physical examination or the medical history.

Taking the History

72. Taking the history starts immediately upon arrival at the scene by making *observations of the environment* (e.g., mechanisms of injury or any bottles of medication nearby).
73. History-taking may involve the patient himself, the patient's family, and bystanders.
74. When one is obtaining a history, the following rules should be followed: (a) Avoid asking questions that suggest answers to the patient. (b) Avoid questions that can be answered "yes" or "no." (c) Ask questions about a given body area or organ system *before* examining that area.
75. The first piece of information to obtain is the patient's *chief complaint*.
76. Once the chief complaint has been ascertained, it is necessary to learn more about it by obtaining the *history of the present illness*.
77. History of the present illness is obtained by gathering the following information: location of the problem, quality of the pain, intensity of the pain, quantity (How much and how often?), chronology (time of onset and duration), setting (What precisely occurred?), scenario of the first symptom, aggravation and alleviation (What makes the symptom worse or better?), associated complaints (What are the related symptoms?), and medications (Has the patient taken any?).