

# *The Clinical Practice of Medical-Surgical Nursing*

*Marjorie Beyers, R.N., M.S.N. Susan Dudas, R.N., M.S.N.*



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*Marjorie Beyers, R.N., M.S.N.*

*Director, Evanston Hospital School of Nursing  
Evanston, Illinois*

*Susan Dudas, R.N., M.S.N.*

*Nurse Consultant, Department of Health, Education, and Welfare,  
Public Health Service, Division of Resource Development,  
Nursing Section, Chicago, Illinois; Independent Nurse Practitioner  
and Ostomy Care Specialist, Whiting, Indiana*

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*This book is dedicated to our families*

# Contributing Authors

*Cornelia van der staay Kenner, M.S.N.*

*Instructor in Surgical Nursing, Department of Surgery, Southwestern Medical School, University of Texas Health Science Center at Dallas; Assistant Professor, University of Texas College of Nursing*

*Mary Ann Krol, M.S.N.*

*Assistant Professor, Medical-Surgical Nursing, Loyola University School of Nursing, Chicago*

*Mary Marrs, B.S.N.*

*County Health Nurse, Boone County, Indiana*

*Virginia Myers Mermel, M.S.N.*

*Doctoral Candidate (D.N.Sc.); Instructor, Georgetown University School of Nursing, Washington, D.C.*

*Eileen Mulqueeny, M.S.N.*

*Assistant Specialist, University of Hawaii School of Medicine, Honolulu; formerly Assistant Professor, University of Hawaii School of Nursing*

*Irene Schreck, M.S.N.*

*Assistant Professor, Marquette University College of Nursing, Milwaukee, Wisconsin*

# Preface

This book is a representation of the knowledge of nursing practice in the evolving field of medical-surgical nursing. From their varied experiences, the authors have confirmed that the proper basis for nursing practice is a sound knowledge of health and disease in the broadest sense—how one stays healthy, the physiologic and psychological changes in illness or dysfunction, and the adaptations people make to changes in their health status—and have developed this book accordingly. Peripheral to this basis for nursing practice are the myriad nursing specialties such as acute care, chronic care, gerontologic care, public health care, and advisor or consultant to other care givers. Another determinant is the organizational structure within which nurses function; these structures are of necessity and purpose different in many respects, and the differences influence nursing practice.

The scope of the book is the nursing care of adults with medical-surgical illnesses. The book is primarily intended for undergraduate nursing students who have a beginning competence in the knowledge and skills fundamental to nursing and who have completed basic social and physiologic science courses. It is expected that the student is able to integrate this previously acquired knowledge with new knowledge in this book. The practicing nurse will find this book a useful reference. Assessment of the patient's condition, care and treatment methods, decisions about care, and evaluation of the patient's response and progress from acute illness to rehabilitation are considered in relation to the basic disease processes most frequently encountered in the adult population.

In Part I, the reader is drawn into the health-illness arena with its many variables. Discussed are the health care practices commonly encountered in medical-surgical nursing: medical therapy, surgery, fluid and electrolyte balance, oncology. In Part II the systems approach is used for autonomous chapters that may be studied in sequence or at random. The straightforward presentation of the content enables the faculty to have greater

flexibility in using the book in a given curriculum. Trauma and emergency care are integrated with the content along with the major problems created by dysfunction within a system. Care of the patient in shock or with thermal injuries is included in separate chapters because the patients who undergo these complex problems may have one or many conditions representative of the interaction among body systems.

The authors have deliberately selected a narrative presentation to encourage students to learn through understanding relationships among events. Too often nurses have been taught to learn long lists of events without connection with the implications of these events to a basic physiologic process or to the alternative outcomes. Human beings are different; they react individually to illness and they cannot be fully cared for on the basis of a common list of events or actions. The nurse who learns relationships and who integrates information can become increasingly sensitive to these individual differences among people and can better adapt to changes in the patient's condition and in the approaches to giving care.

It is the authors' opinion that the core of nursing practice remains the one-to-one nurse-patient relationship. This relationship is often directed by imperatives of the patient's major illness or disease. The imperatives influence the nurse's immediate actions, decisions, and care planning tailored to the individual patient.

Nursing is an ideologic yet scientific profession. While this view may seem dichotomous, it is the underlying message of this book. The authors have attempted to subtly define the role of the nurse in explaining the nursing implications in the content presented. Not all nurses will agree with the stated implications, but the authors assume that all nurses in practice do accept responsibility for their personal practice of medical-surgical nursing. It is the authors' hope that this book will serve as a useful reference for them.

*M. B. and S. D.*

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Charles R. Baxter, M.D., F.A.C.S.  
Professor, Department of Surgery, Southwestern Medical School, University of Texas Health Science Center at Dallas

Fred Bozett, M.S.N.  
Assistant Professor, University of San Francisco, San Francisco, California

Alice Bradee, M.S.N.  
Assistant to the Director of Staff Education, Madison General Hospital, Madison, Wisconsin

Sue Driscoll, M.S.N.  
Clinical Specialist, University of Wisconsin, Madison, Wisconsin

Cynthia Dunsmore, B.S.N.  
Faculty, Evanston Hospital School of Nursing, Evanston, Illinois

Mary Gordon, R.N., M.S.  
Clinical Specialist, Parkland Memorial Hospital, Dallas, Texas

Evelyn Greathouse, R.N.  
Staff Nurse, Operating Room, St. Anthony's Hospital, Crown Point, Indiana

Maureen Groër, Ph.D.  
Associate Professor, School of Nursing, Lewis University, Lockport, Illinois

John L. Hunt, M.D.  
Assistant Professor, Department of Surgery, Parkland Memorial Hospital, Dallas, Texas

Anita Kedas, M.S.N.  
Clinical Nurse Specialist in Rehabilitation, Veterans Administration Hospital, Danville, Illinois

Margaret (Peggy) Keeler, M.S.N.  
Clinical Specialist in Nursing Education, Veterans Administration Hospital, Palo Alto, California

Maralyn Keyes, M.S.N.  
Director of Staff Development, Lutheran General Hospital, Park Ridge, Illinois

Nancy Laatsch, M.S.N.  
Nursing Coordinator, Evanston Hospital, Evanston, Illinois

Ellen McDonald, B.S.N.  
Coordinator, Gastrointestinal Clinic, Mt. Sinai Hospital, Milwaukee, Wisconsin

Ralph Meyer, Jr., M.D.  
Head, Division of Physiology, Department of Basic Science, Marquette University, Milwaukee, Wisconsin

Bonnie Myers, B.S.N.  
Faculty, Evanston Hospital School of Nursing,  
Evanston, Illinois

Peter H. Nennhaus, M.D.  
Cardiovascular Surgeon, Evanston, Illinois

Elizabeth O'Connor, R.N., E.T.  
Holy Cross Hospital, Silver Springs, Maryland

Andrew A. Pandazi, M.D., S.C.  
Urologist, Milwaukee, Wisconsin

Phyllis Patterson, M.S.N.  
Clinical Specialist in Hematology, University  
of Michigan, Ann Arbor

Anne Porter, M.S.N.  
Faculty, Evanston Hospital School of Nursing,  
Evanston, Illinois

John E. Read, M.D.  
Ophthalmologist, Chesterton, Indiana

Barbara Rolling, M.S.N.  
Clinical Nurse Expert, Outpatient Nursing  
Service, National Institutes of Health,  
Bethesda, Maryland

Francis Rotter, M.D.  
Orthopedic Surgeon, St. Michael's Hospital,  
Milwaukee, Wisconsin

Gloria Smokvina, M.S.N.  
Doctoral Candidate, Wayne State University,  
Detroit, Michigan

Thora Vervoren, B.S., R.Ph.  
Director of Pharmacy Services, Columbia  
Hospital, Milwaukee, Wisconsin

Vivian Weatherby, R.N., E.T.  
Suburban Hospital, Bethesda, Maryland

Judy Zoellner, M.S.N.  
Director, Continuing Education, Evanston  
Hospital, Evanston, Illinois



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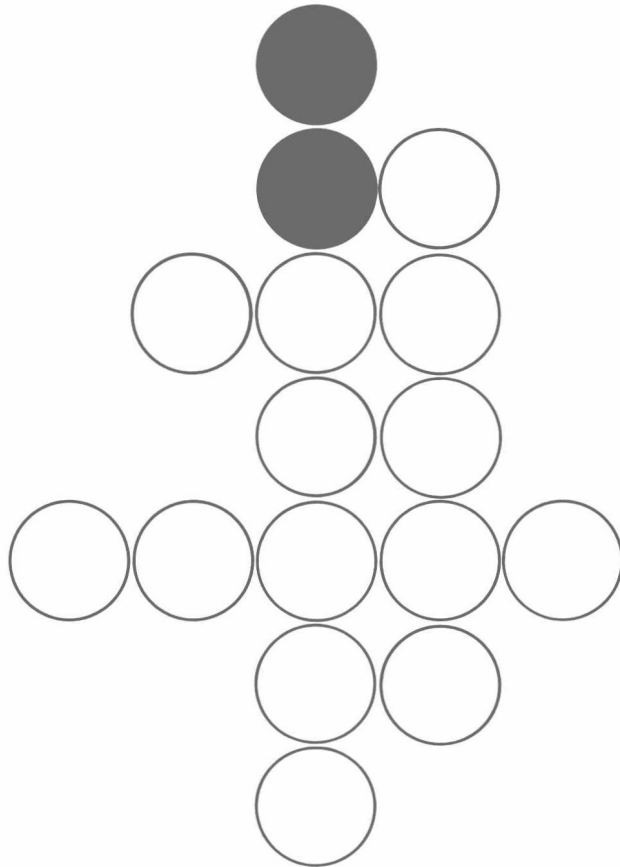
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*part I*

*Concepts Basic to  
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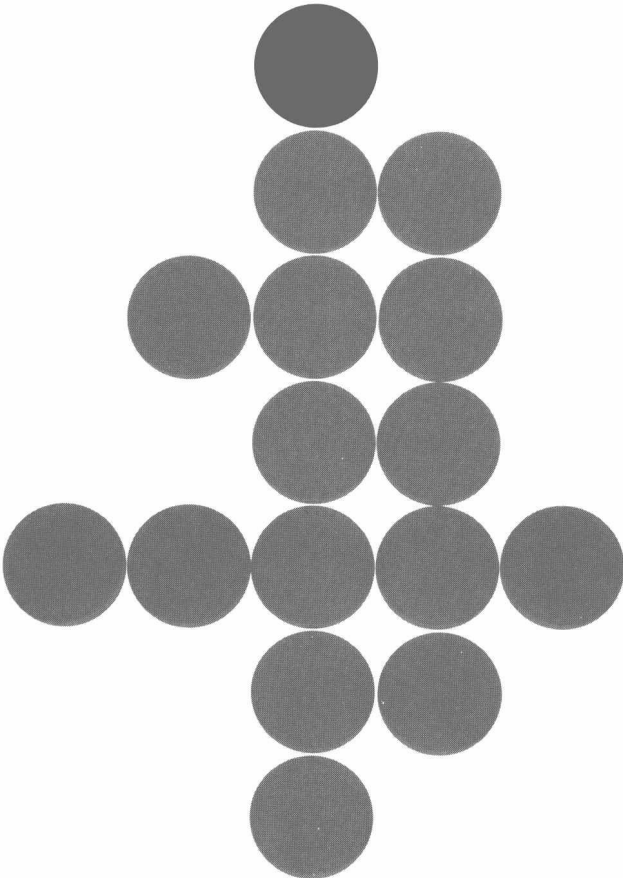


## NOTICE

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.

*chapter 1*

*Health and  
Disease States*





## Basic Concepts

Nursing is a universal profession; nursing care is a legitimate and authorized function of the nurse. The Council of National Representatives of the International Council of Nurses adopted a new definition of *nurse* in August 1975. This definition is as follows:

A nurse is a person who has completed a programme of basic nursing education and is qualified and authorized in her/his country to practice nursing. Basic nursing education is a formally recognized programme of study which provides a broad and sound foundation for the practice of nursing and for post-basic education which develops specific competency. At the first level, the educational programme prepares the nurse, through study of behavioural, life and nursing sciences and clinical experience, for effective practice and direction of nursing care, and for the leadership role. The first level nurse is responsible for planning, providing and evaluating nursing care in all settings for the promotion of health, prevention of illness, care of the sick and rehabilitation; and functions as a member of the health team. In countries with more than one level of nursing personnel, the second level programme prepares a nurse, through study of nursing theory and clinical practice, to give nursing care in cooperation with and under the supervision of a first level nurse [36].

The focus of nursing, as defined in this statement, is “. . . the promotion of health, prevention of illness, care of the sick and rehabilitation” and has broad and complex implications for the nurse. Because health and illness are very personal and private matters for any person, the recipient of nursing care must be a participant in the operational aspects of nursing care. In medical care one does not deal with absolutes of cause and effect, but rather with processes. These include processes of physiologic, psychological, and societal natures. There is no one best way to deal with a person's health problems; even outcomes of good quality care cannot be determined in advance or be assured because of factors no one can explain. We do not know why, given the correct and appropriate care and treatment, some people recover and others do not. Nurses therefore can achieve their goals only through working within these processes. While certain facts and principles are generally accepted in the scientific arena, these facts and principles must be applied to the processes that are operational in the care situation and must be viewed as guidelines or signposts in the selection of

specific activities to meet the requisites of any given situation.

Facts, principles, and concepts change in importance and in perspective within a situation. Knowledge of contingencies, individual differences, situational variances, and environmental influences must be learned along with the facts, principles, and concepts of illness and disease if the nursing student is to be successful.

No one textbook can include all the aspects of nursing care that must be learned by a nursing student. The scope of this book is defined as the care of adults who have medical-surgical illnesses or the potential for developing health problems. It is expected that the student who is to study the content in this book will have a basic knowledge of anatomy, physiology, chemistry, nutrition, microbiology, social sciences, and introductory nursing care. It is also expected that the student will correlate the content herein with that found in medical and other nursing texts, current journals, and other sources of behavioral and physiologic science information.

The content for this book was selected and developed with the following in mind:

1. There are no absolutes or definite answers or solutions to all health care problems.
2. Because each person presents a unique set of needs, individualized nursing care must be determined from a generalized background of knowledge and experience.
3. Even though each person has a unique health status or set of illness problems, certain criteria can be evaluated to define a person's unique needs within a broad scope of knowledge.
4. The human body functions as an integrated unit with multiple interacting systems and subsystems.
5. In order to understand the functioning of the integrated human being, it is helpful to dissect the broader entity to learn about and to understand the systems and subsystems that contribute to the whole.
6. Integration of content related to nursing care depends on internalizing knowledge and experience from many different sources. A sense of wholeness is achieved by the nursing student through synthesis of the knowledge and experience.

7. A person who becomes a nurse continues to be a student throughout life, since the nurse and the recipient of health care continually evolve in attaining maturity in a continually changing environment.
8. In the process of evolution, each nurse and patient develops concepts of role, function, and purpose based on a continually developing philosophy and framework of supporting concepts, principles, and facts.

Stated in another way, this text has been developed from the viewpoint that there are emerging sets of knowledge about health and illness and alternative avenues for care. The information presented herein focuses on processes that can be applied to many different but somewhat similar situations.

The content has been organized so as to facilitate the student's understanding of the processes of illness, treatment modalities, identifiable expected outcomes of care, and preventive measures. The chapters provide a body systems approach to these processes. By studying the body systems as divisions of human function related to physiologic systems, it is possible to study each system for its own properties, characteristics, and dysfunction. This does not negate the importance of viewing an illness in the broader sense of a person's total body functioning. Any system can be divided into component parts. For adults with medical-surgical illnesses, the functioning of the cell systems and subsystems provides a reasonable and practical basis for the study of expected outcomes of defined illnesses.

Nursing knowledge as currently studied provides a baseline for the student's entry to the profession. Within this context, the professional nurse must continue to develop health care knowledge and skills as information is revealed or discovered so that there is a continual building of an operational and ever-current repertoire of competencies.

As the environment, society, and culture evolve, so do the role and function perceptions of the individual who participates in this broader environment. Each nursing student must initially define a personal concept of nursing that is true to his or her self-concept and must relate positively to the concept of the professional nurse within the profession and in keeping with the broader

concept of the system of health care provided by all health professionals.

Nursing care is based on knowledge of man as an integrated being who lives in and is dependent on an environment. The concept of environment may be applied also to the singular unit of a cell, as every cell exists in a unique environment within the body. Environment is also important to the integrity of internal body processes and to behavior within the organism. A person functions in relation to his immediate environment: room temperature, humidity, stressors, and stimuli. Even the space a person occupies is surrounded by the broader environment of family and community, and communities relate to broader determinations of space, which may include the world in its orbital environment. The total functioning of the individual therefore is complexly integrated within the body, as man relates to his environment and participates in situations and events in his own personal orbit.

Each aspect of human functioning, from the singular cell to the broad concept of the world in space, is complex. The amount of knowledge man has about the cell and about the events that happen between the singular unit of the cell and the multiple components of space is overwhelming. The amount of knowledge that is unknown must be equally overwhelming. In order to develop a perspective for the scope of nursing care, the nurse must first examine the functioning of the human body in relation to the space it occupies.

Human beings and the space they occupy are interdependent. Their perceived relationships with others and with the environment often determine their concepts and attitudes toward functioning. **Illness** may be defined as acute or chronic maladaptation, and **health** may be considered a relative state in which a person functions in an interdependent way to perform work. (Work refers to any activity.) Throughout life a person seeks to define health and illness in terms of their impact on his functioning.

The concept of what is a state of health may change as the person matures. For example, a person who has developed chronic constipation may, at the time of the onset, consider himself "sick" or ill. As the condition persists and no pathologic cause is found, the condition becomes part of that person's usual daily

situation. If the person adjusts to the condition and deals with the constipation as a characteristic of his daily functioning he is said to have adapted. On the other hand, if he continues to perceive constipation as an illness he is never really healthy or well as long as the particular condition persists.

Certain changes in human functioning are accepted as components of the normal aging process. Examples are the physiologic changes of arteriosclerosis and osteoporosis. Consequently, for many people the concept of a state of health is directly related to age; arterial dysfunction in a young adult is abnormal and constitutes a state of disease. The same condition in a 60-year-old person is expected and therefore normal and congruent with a concept of health for this person. Gradually declining perceptual abilities in vision and hearing are also expected, as are many of the psychological changes associated with aging. It should be pointed out, however, that chronologic age and physiologic age are not necessarily directly related.

What is considered to be maximal functioning for a given person may also vary with the degree or amount of stresses that person experiences. These stresses may arise from internal physiologic processes, from interaction with others, and from environmental stressors such as an influenza epidemic. In most instances, the stresses one experiences are a product of the total set of life events in a given time and are difficult to categorize with specificity.

Much has been written about human adaptation. It is known that a person has certain innate capabilities for adaptation and the ability or potential to learn new patterns and skills. It is also known that a person has some degree of control over his life events but is also subject to unknowns—events that occur without forewarning and often with no explainable cause—events which, despite their uncertainty and uncontrollability, can be adapted to or which may be so stressful that adaptive resources may become immobilized.

Humanity works continually to achieve order and a sense of control over the events that influence human life. For example, research on major health problems such as diabetes, heart disease, blood dyscrasias, and nervous system diseases is ongoing. Breakthroughs in research enable us to better

understand and treat disease. Identification of a new vaccine may be important in controlling a communicable disease; the ability to provide for exogenous hormones is necessary in the treatment of endocrine imbalances. Knowledge about the risk factors that cause heart disease can help a person learn to avert the disease. As humanity strives to discover more about diseases and their causation, the very diseases being studied are evolving, changing in nature and effect. Even as scientists discover how to prevent or treat existing diseases, new pathologic processes become evident, further challenging human creativity and ingenuity.

All these considerations lead one to understand that nursing care, focused on prevention of disease and care of the sick, is of necessity based on an inexact science that contains threads of specific knowledge, general application, and generalized sets of premises throughout. How does a nurse cope with this complex and elusive description of nursing care and content? In order to be effective, each nurse must define a role, support that role with knowledge, and practice the skills necessary to achieve the objectives of the role.

Just as the cell is the singular autonomous unit of the human body, a person is a singular autonomous unit of a broader system. The person, whether a nurse or a recipient of care, interacts in the broader system just as the cell interacts in tissue. Physiologically, tissues form organs that may be considered equivalent to families in a community. Further, systems comprise an integrated functioning unit of the body, which can be equated to the society in which communities of people exist. The role of the nurse in this society is an interactive role in which the nurse relates to singular units, individual patients whose behavior is integrated in the broader systems of family, community, and society.

In the following pages, these ideas will be discussed in detail. The cell and its relation to body processes, functions of the body, and disease processes along with modes of intervention will be discussed in a general way.

## The Cell

Cellular activity is regulated and controlled by numerous processes, such as water and electrolyte balance and hormonal and ner-



vous system activity. Within the body there are many different types of cells, each with specific functions and of varying sizes and shapes. The fine differentiation of cells accommodates the many ongoing processes in the body.

Osmotic equilibrium is common to all cells as water and charged and uncharged molecules are exchanged among cells and their intracellular spaces. The electrolytes (charged) are important in enabling the cells to maintain membrane potential differences. A negative potential difference exists between the inside of the cell and its surrounding extracellular space. This difference is the **membrane potential**, which regulates the entry or exit of electrolytes to and from the cell. The cell membrane prevents passage of large molecules and permits passage of water, small molecules, and lipid soluble substances.

Movement of molecules to and from cells occurs through simple diffusion, diffusion assisted by carriers, electrical potentials, and solvent drag. Each of these processes is operational in providing the cell with the materials it requires for maintaining life and function.

The cell membrane has diverse functions and serves as an insulator for electric energy, as a barrier for movement of certain molecules and water, and as a means of containment for intracellular structures. Within the confines of the cell membrane, cellular organelles are present in the cytoplasm, which is a semifluid gel-like material. The primary composition of the cell is protein made up of amino acid chains connected by peptide bonds. The possibilities for different structural arrangements are great because there are more than twenty different amino acids that can be connected in pairs. The particular structural arrangement of any given cell is determined by the genetic code, which is found in chromosomes in the nucleus of each cell.

The **nucleus** of the cell is an organelle that controls the replication, regulation, and maintenance of the cell. Survival of the cell is a function of the nucleus. When cells divide (mitosis), the nucleus divides to pass on the hereditary message of that cell's structure, growth, and developmental requisites so that a given type of cell can be replicated exactly and maintained. Chromosomes, which contain these messages, are deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) and

protein. DNA contains the code for the cell and is necessary for protein synthesis. Nucleotides comprised of base, sugar, and phosphate make up the DNA and RNA molecules.

The arrangement of the different available bases forms a genetic code for the DNA. The codon of an amino acid is its three-base sequence, which is particular for a given gene. Bases of nucleotides are of two types: **pyrimidine bases**, which are cytosine and thymine, and **purine bases**, which are named adenine and guanine. These two types of bases are joined, so that one of the pyrimidine bases is joined with one of the purine bases in variable sequences. DNA molecules are then formed by pairing of the purine and pyrimidine bases in sequence as determined by the codon.

The DNA molecule provides the framework that specifies how the protein molecule is arranged. The gene carries this information and is considered the hereditary unit of the cell. Attached to chromosomes, genes are capable of exactly reproducing with the cell's division and controlling the synthesis of protein as carried to the ribosomes with messenger RNA (mRNA).

Messenger RNA is formed in the nucleus and enters the cell cytoplasm where it is gathered by ribosomes, another cellular organelle. RNA strands form the basis of synthesis for other protein molecules. The RNA carries the cellular message or code and attracts another type of RNA (transfer RNA), which occurs in different specificities, each type being attracted to its match-specific code of RNA. Enzymes in the ribosomes catalyze the binding of the mRNA and the tRNA. When the protein molecule is completed, it is released to the cytoplasm.

**Enzymes** are protein substances formed from amino acids in the cell. Present in minute amounts, enzymes are potent catalysts of cellular activity. Some enzymes are retained within the cell whereas others are released from the cells for function in organs or in systems. Digestive enzymes are good examples of the latter.

Synthesis of DNA and RNA requires not only enzymes but also an energy source. This energy source is adenosine triphosphate (ATP), which is formed in the **mitochondria**, the organelles that are the cell's power-house. The mitochondria take in nutrients and convert them to ATP. Energy is stored in