

LEONA MOURAD

Nursing Care of Adults with Orthopedic Conditions



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Preface

Care of persons with orthopedic conditions is a subspecialty in the field of nursing. Goals for nursing care of orthopedic patients are the same as those for nursing in general—to assist a person in maintaining, retaining, attaining, or regaining a healthy state. To achieve these goals and help the patient with musculoskeletal alterations achieve the highest possible level of health, nurses must acquire specific knowledge and skills that will have the greatest probability of success.

This book is written to provide guidelines for nurses caring primarily for adults with orthopedic conditions. Several other texts currently available address the specific needs of children and adolescents with orthopedic conditions.

Whenever possible, material is organized according to the musculoskeletal effects of the patient's condition correlated with the secondary effects of that condition on the other subsystems. Physiological and psychological effects are correlated with their affects and effects not only on the patient but on the family members, society, and nursing. Systems theory and concepts are used to describe major factors that must be considered thoroughly in nursing plans and strategies in order to achieve goals. Health, orthopedics, nursing process, stress, inflammation, and cellular growth and proliferation are some of the concepts described and correlated primarily with the musculoskeletal subsystem and then with the other subsystems. Nursing strategies are correlated with the patient's efforts to achieve the desired goals.

Chapters 1, 2, and 3 describe the major concepts referred to throughout the book. Tables and figures clarify the verbal descriptions. A sample nursing process is included in the appendix. The reader may want to read that sample process before proceeding to the remainder of the chapters on specific care because the sample should clarify the methodology and terminology used in those chapters.

Chapters 4 through 8 provide specific nursing information for the care of patients in casts or in skin or skeletal traction and for those people having sur-

gery and total joint replacements. The emphasis is on the nursing care with the pathophysiology correlated to the care needs of the patients.

Chapters 9 and 10 are in-depth discussions of the affects and effects of orthopedic conditions on the whole person. Patterns of acute and chronic pain, acute and chronic illnesses (health alterations), and recovery processes of people experiencing acute trauma, pain, anxiety, and long-term recovery are described. Chapter 10 discusses nearly 100 complications categorized per subsystem—unique to this textbook.

Chapter 11 discusses aids to habilitation (clothing, dressing, and outfitting oneself) and aids to ambulation and rehabilitation. Preventive health measures to prevent injury, disease, and disability are incorporated in Chapter 11.

Moral and ethical issues, patient rights, and rights of family members and society as they affect nurses and nursing are the topics of Chapter 12. Issues covered include the roles of nurses regarding informed consent, patient rights, euthanasia, the patient's right to privacy and to refuse intrusive procedures, and a discussion of reasonable, ordinary, and prudent care. Several situations for thought and discussion are presented at the end of Chapter 12.

Chapters 13 and 14 present extensive discussions of nutritional needs and laboratory tests correlated with the specific needs and meanings for orthopedic patients.

Nurses caring for patients with orthopedic conditions usually encounter the words “greater and lesser trochanters.” Have you ever wondered why those prominences are called trochanters? The last section is not simply a glossary of terms. It contains over 500 words with their definitions and root derivations. (Trochanters are defined and derived on page 476 in that chapter.)

Through the written material and the many tables, figures, and pictures in this book, it is hoped that nurses and students will experience the pleasure of learning that somewhat esoteric knowledge associated with the care of orthopedic patients. This book was enthusiastically written to provide a source of information for nurses assisting people in maintaining, regaining, retaining, or attaining health—the ultimate mission of nurses and nursing.

Leona Mourad

Acknowledgments

One who undertakes writing a textbook must count on the assistance and support of relatives and friends. Such a goal could not be achieved without that support.

Much credit for the completion of the book goes to my husband, George, whose encouragement, patience, and understanding were vitally necessary and gratefully received. Our daughter, Valerie Wilson, was particularly helpful in assembling the glossary of terms. Gretchen Kruger drew the excellent illustrations. Dr. Marie Collart performed the camera wizardry for all the photographs in the book. Gabriel Palkuti developed the photographs with skillful artistry. Mrs. Florence Searfoss was the dedicated, speedy, and willing typist. Mrs. Lois South provided very perceptive questions and comments as a friend and reflector.

I also wish to thank Dr. John Roberts and Mrs. Edith Redkey, who assisted with securing many of the roentgenograms for photographing; Dr. Richard Turner, who willingly provided the films of total joint replacements; the Columbus Medical Equipment Co., which allowed photographs.

Thanks are due also to all the students who asked why something was necessary or how something was to be done. Their questions guided my efforts. I have tried to answer their questions as fully as possible.

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1

Theoretical Bases for Orthopedics and Nursing Processes

VOCABULARY LIST*

Client	Load
Concept	Nursing process
Environment	Orthopedics
Feedback	Output
Goal	Patient
Goal achievement	Power
Goal conflict	Subsystem
Health	Suprasystem
Health alteration	System
Input	Systems theory
Interaction	

A goal of all living persons is to be able to move freely and comfortably from place to place. Free and comfortable movement requires healthy musculo-skeletal tissues, neural integration, and adequate circulation.

As human beings live and age, they encounter situations such as injuries, inflammations, and diseases that limit their mobility and cause discomfort or pain. Limitations in mobility and pain lead to temporary or permanent disability and health impairment.

Nurses involved in the care of adults with orthopedic conditions must have current knowledge and skills in order to assist persons in attaining and maintaining normal health or in regaining as much health as possible. Strategies that lead to such personal health states should benefit nurses,

* Words in vocabulary are defined either in the chapter or glossary.

2 Theoretical Bases for Orthopedics and Nursing Processes

patients, and—ultimately—society by way of the interactions, movements, and functioning of healthy persons in personal, interpersonal, and social situations.

A framework for nurses assisting persons with orthopedic conditions in regaining comfort and mobility is presented throughout this book. Knowledge bases, assessment factors, and strategies designed for optimal goal achievement are correlated with specific orthopedic conditions of adults. Evidence of goal achievement is determined by the degree of comfort, function, and movement achieved.

Major topics for discussion center on:

- Health and health alterations of an orthopedic nature(s).
- Systems theory with applications to orthopedics.
- Correlations of systems and concepts to orthopedics and nursing.
- Nursing process as method and vehicle.
- Growth and development influences on adult orthopedic conditions.

Nurses become involved when persons seek assistance because injuries, infections, or other conditions are affecting their usual states of health.

THE CONCEPTS OF HEALTH AND HEALTH ALTERATIONS

The concept of health as a primary goal of life and living is examined thoroughly in Chapter 3. Classification of a person as healthy is based upon ability to carry out daily living activities normally and naturally within parameters established for normal structure and function of the body's cells, tissues, and organs. When one is unable to perform or needs assistance with the usual daily activities, his or her health is said to be altered. Health alterations are those situations that interfere with the ability to obtain, contain, maintain, or dispose of energy, information, and raw materials, thus affecting the person's freedom and ability to move with ease and comfort.

Health alterations that affect persons orthopedically are the bases for the chapters in this book. Alterations with orthopedic associations focus on the musculoskeletal tissues as a subsystem of the human being; an understanding of systems theory is essential background information.

SYSTEMS THEORY

Systems are usually defined as a group or set of units and the relationships among them. Delineation of the relationships is predicated upon the determination of the system for study, the boundaries of the system, or the focus of study.

The boundaries are decided on or set once the system has been determined. Those items within the system's boundaries are called subsystems (less than the system) and those things outside the system's boundaries (greater than the system) are suprasystem characteristics. Both subsystem and suprasystem characteristics are within the environment of the system.

Systems may be open, partially open, partially closed, or closed. Inanimate systems are usually closed, since they are incapable of exchanges with their subsystems or suprasystems, whereas living systems are either partially open or open through their fairly constant interchanges with their environments.

The system's functions are to obtain, contain or maintain, and dispose of information, raw materials, or energy to meet specific purposes. The boundaries that have been set for the system are the "capacitors" for the work of the system. That is, the boundaries determine how and what is to be obtained (input), how it is to be contained and maintained (throughput), and how or what is to be disposed (output).

Applied to human beings as an open system correlated with health, systems theory permits the study of health, how health alterations occur, and requirements to regain health. Specifically, an orthopedic health alteration can be correlated with its suprasystem and subsystem units to determine what is needed to regain the system's (body's) health. Figure 1.1 illustrates the structural and functional units of systems.

There are many systems for study within health care disciplines. The nurse-patient system is a major system for nursing. In the nurse-patient system, the behavior of one affects the other and influences the subsequent behaviors of each participant. The subsystems of the nurse-patient system would be the biopsychosocial and cultural characteristics of the two members. In the suprasystems would be, among others; the departments or divisions of the health care facility; the medical; nursing, and auxiliary personnel; and the functions, services, and equipment required to achieve the goals of the nurse-patient system.

Figure 1.2 illustrates general systems units and units in a nurse-patient system.

Feedback

Information, called feedback, permits systems to become more open or more closed. Feedback gives the system data to alter its functions of obtaining, containing (maintaining), or disposing with the objective of regaining, retaining, attaining, or maintaining congruence with its environment. When resources are sufficient within all three areas of suprasystem, subsystem, and system, adjustments can usually be made fairly easily and quickly from the

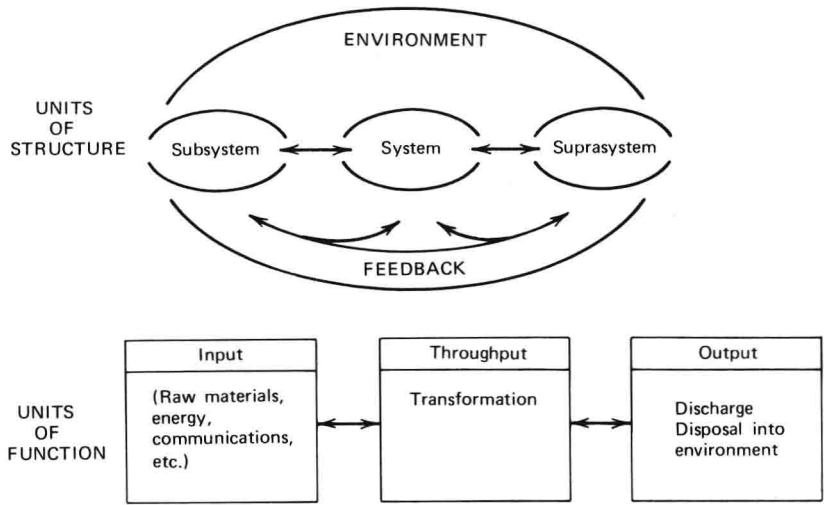


Figure 1.1. The structural and functional units of systems. The boundaries of the *system* determine the boundaries of the sub and suprasystems. The environment is outside each of the subelements.

feedback and the system can regain its equilibrium. When one or another of the unit's requirements or demands are too severe, too sudden, or too numerous, the boundaries of the system cannot meet the demands, the system's limits are exceeded, the system cannot maintain its equilibrium, and thus the system is in altered equilibrium. If health as a system is a state of dynamic equilibrium, then altered health would be a system of altered equilibrium. Feedback throughout the system's units serves to help it regain equilibrium and growth. Negative feedback helps the system to regain an optimal state, and positive feedback leads away from the optimal state. Living, open systems tend to use negative rather than positive feedback for growth and regaining of health.

CORRELATIONS OF SYSTEMS THEORY AND CONCEPTS

Just as systems theory is a vehicle to show the interrelationships with, within, and without a set of units, concepts can accomplish the same goals. Concepts are one person's ideas and images of words, phenomena, and things (subsystem or suprasystem units) within, without, or with a specific context (system). Concepts can thus be an application of systems theory from the imagery described and delineated relative to particular contexts and units. A concept of "systems" should conjure up one or more implicit mental images or pictures. These

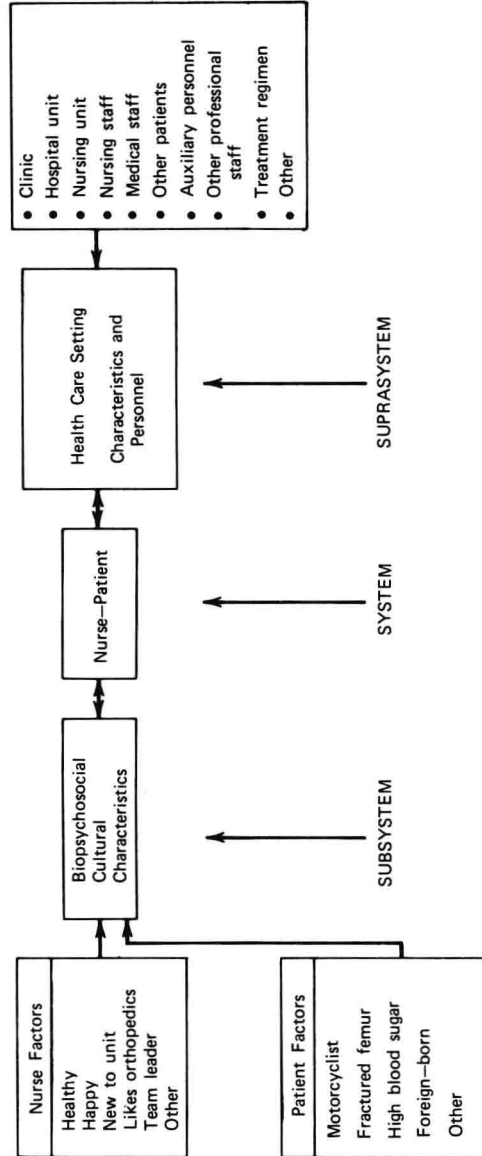


Figure 1.2. Examples of a nurse-patient system, subsystem and suprasystem. Other examples can be substituted when pertinent to a specific nurse-patient system.

images can be explicitly described through verbal interactions between persons. Verbal expression permits clarification, correlation, and corroboration of the images and relationships. Additionally, verbalization provides explicit definition to the boundaries for the system's units and to the framework for the concept under discussion. Verbalization leads to understanding and incorporation into one's philosophy to govern actions and thoughts. The similarities between the units of systems theory and concepts are shown in Figure 1.3.

Application of Systems and Concepts to Orthopedics

Orthopedics as a concept begins with defining the word. From its derivations, orthopedics means straight children (Gr. *orthos*, straight, + *pais*, child). Babies and children who required straightening of their malformed or malpositioned limbs concerned physicians because of the effects of the malformations on the children's ultimate growth, development, and ability to move freely and comfortably. The name persists today, though "orthopedics" now embraces babies, children, and adults from their prenatal periods to the time of their deaths. Orthopedics now incorporates not only congenital malformations and malpositions, but also acquired conditions resulting from trauma (or from metabolic and connective tissue diseases affecting the muscles, nerves, cartilages, bones and joints, tendons, and other contiguous tissues. "Straight" now correlates with the physiological and psychological strengths of tissues that control straightness in space. Physiological tissues are the muscles, bones, tendons, nerves, cartilages, and other tissues that control movement, posture, and stability in space. Psychological "straightness" is governed by the mental perceptions of self, the verbal and nonverbal interactions that permit movement and stability in personal, interpersonal, and social relationships (see Fig. 1.4).

Correlating the concept of orthopedics with systems theory can be accomplished by using babies, children, or adults as half of the nurse-patient system. The specific biopsychosocial and cultural characteristics of the unit of nurse and baby, child, or adult are the pertinent subsystem factors. The health care facility, whether physician's office, clinic, hospital, or cast room, would constitute the suprasystem influencing the behaviors of the nurse-patient with others in the environment. All the physiological, psychological, and cultural elements in the nurse-patient system influence the mobility and comfort of their personal, interpersonal, and social spheres and behaviors. The interrelationships of systems and concepts are shown in Figure 1.3 with an application to an orthopedic situation.

When changes are made in the system, the supra- and subsystems must also change to accommodate the new relationships. For example, the nurse-patient system can be changed by elevating one or more subsystem units to system

UNITS OF STRUCTURE		Environment	Definition of Concept	
	Suprasystem	General Characteristics	Callus formation and union after fracture: deposition of calcium in fibrin meshwork.	
	System	Specific Characteristics	Stages of inflammation, bone resorption and formation, remodeling for strength.	
			Hematoma formation, fibrin meshwork, granulation, calcium deposits, callus formation across fracture ends, remodeling.	
	Subsystem	Elements of Function and Position	Activity of osteoblasts; activity of osteoclasts; availability of raw materials and energy (oxygenated blood, nutrients, electrolytes, calcium, and others; maintenance of immobility; bone resorption and remodeling of callus).	

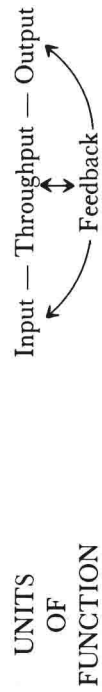


Figure 1.3. Correlations between units of systems and concepts. Left-hand column shows the system's units; middle column the conceptual units; right-hand column contains examples of data. Substitutions can be made at each unit between systems and concepts.

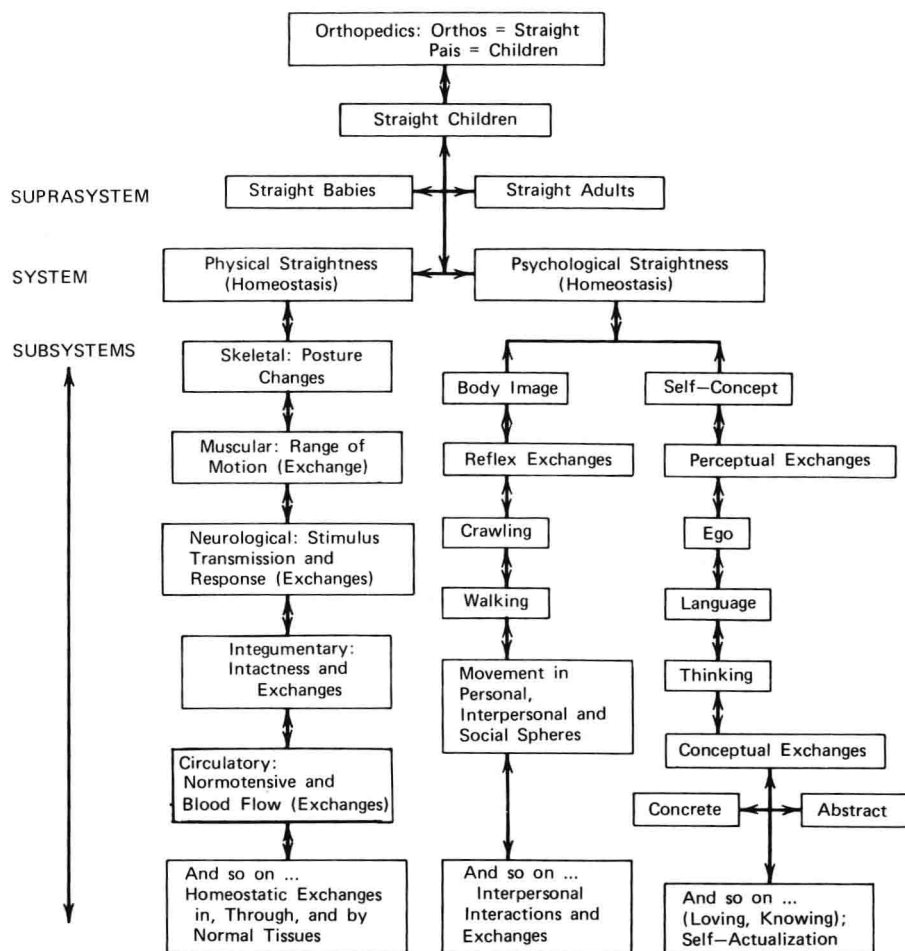
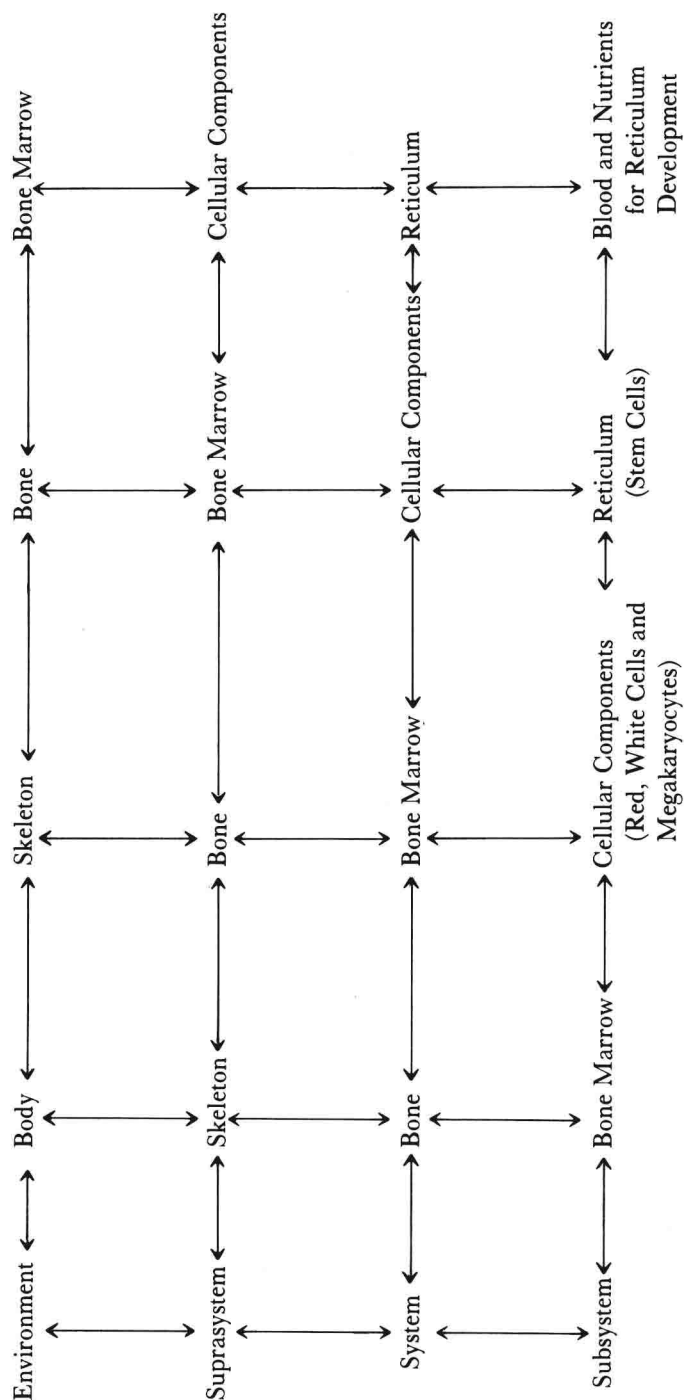


Figure 1.4. The concept of orthopedics correlated with systems. The physiological and psychological system is only as “straight” as the subsystem tissues permit. All subsystems must be included in the interest of entirety or wholeness.

status. The nurse–patient system would then be elevated to become supra-system and the subsystem would be comprised of the subelements making up the new system. Similar changes are shown in Figure 1.5.

Use of systems theory and concepts clarifies relationships of units in, between, and with one another. These vehicles are open, exploratory, and systematic; as such, they are appropriate for use in the human situations involved in nursing.



ENVIRONMENT ↔ SUPRASYSTEM ↔ SYSTEM ↔ SUBSYSTEM

Figure 1.5. Relationships between the units of a system when changes are made. Movement in vertical or horizontal directions signifies the changes.