

ORAL

PHYSIOLOGY

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With 280 figures

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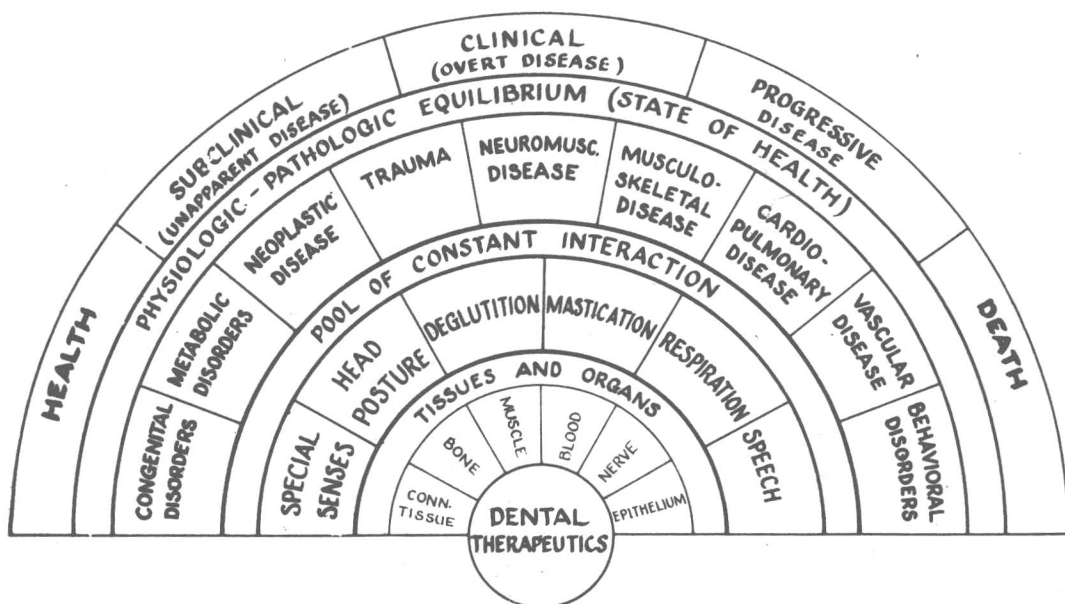
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Health represents a state of equilibrium between normal physiologic activity and the pathologic processes of disease. Shifts in this equilibrium are manifest as clinical symptoms. Dental therapeutics is directed toward the prevention and reduction of these signs. However, to achieve dental health, treatment must include management of the basic tissues, organs, and organ systems during their multiple and joint activities. This chart demonstrates the responsibility of the clinician to examine the symptoms against the background of the whole patient, to observe the morphology and activity of the tissues, to fractionate the separate functional systems, to note the interaction of these systems and their potential for repair and recovery, and then to determine a therapeutic procedure which will create a more favorable state of health. It is against this ebb and flow of health and disease that a dentist must provide dental service—not against the idealized conditions for the nonexistent normal patient.

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Preface

Physiology is the study of tissue and organism behavior. It is the continuum of activity which unites the multiple disciplines in the whole spectrum of a dentist's educational and clinical experience. It relates morphology, phylogeny, growth and development, musculoskeletal function, and psychologic behavior to dental therapeutics. It ultimately unifies education and practice, patient and practitioner.

This text is clinically oriented. Instruction in the basic sciences has been interrelated with the practice of dentistry. It is not intended to duplicate publications in basic physiology or those dealing with the separate areas of clinical dentistry. Rather it is intended to abstract the principles of physiologic activity in the oral structures and to relate these processes to normal growth and development, to pathologic processes in health and disease, and to diagnostic and therapeutic procedures.

The principal theme supports the concept that dental therapeutics is applied within a framework of equilibrium or homeostasis. This equilibrium expresses the summation of the continuous interaction between the normal physiologic processes of health and the altered pathologic processes of disease.

The text material is divided into three parts. Part 1 discusses the structure and activity of the major tissues and organs—epithelium, nervous system, muscle, and bone—and their relation to dental occlusion. It emphasizes the belief that everything associated with dental treatment is affected by the physiologic activity of the nervous and hormonal systems. Part 1 thus describes the neurologic mechanisms which stimulate the growth and development of the dental occlusion and their relation to dental practice procedures by their regulation of the forces of mastication and mandibular motion.

Part 2 discusses the organization of the basic tissues into organ systems which are pertinent to the principal functions of the maxillofacial structures—deglutition, mastication, respiration, speech, and head posture. The inclusion of chapters on speech and head posture emphasizes the responsibility of the dentist to observe function beyond the limits of the oral cavity if he would treat the teeth and their investing structures.

Part 3 discusses the application of the principles of tissue activity to the clin-

ical needs of the major age groups of the life spectrum—childhood, adulthood, and aging. A significant major clinical problem is discussed for each age group. In the child, the significant physiologic and pathologic problems relate to the growth and development of the dental occlusion. There is thus an extensive discussion of congenital disorders, with emphasis upon the cleft palate and lip defects. In the adult, the major stress is placed upon the periodontal problems and their relation to systemic and oral medicine conditions of the patient. In the aging, emphasis is placed upon the prosthodontic problems associated with degenerative, metabolic, and neurologic disease, tumor, and personality alterations. The chapter on aging expands the dental profession's responsibility to treat the ever-increasing number of patients who suffer from long-term illness—the physically and psychologically handicapped and the aging.

In summary, the purpose of this book is to enable the dentist to better serve the needs of mankind by bringing together the diverse findings of scientists and clinicians for more effective communication between their respective disciplines.

SIDNEY I. SILVERMAN

Acknowledgments

The knowledge and judgment necessary to write a textbook on oral physiology is probably beyond any one author's capacity. At best, though he write every word, he is little more than an editor who collates the simple truth of his professional heritage with the experience and judgment of his peers and speculates upon the future. He requires courage and fortitude, gentle humor and kindly persuasion, and must endure the anxiety born of doubt to express through his concepts the ideas of his colleagues, his friends, and his family. To the following I wish to acknowledge my gratitude for their editorial comments, illustrations, and generous good wishes and encouragement.

Dr. Raymond J. Nagle, Dean, New York University College of Dentistry, who suggested the need for this book and who personally encouraged me to write it; Dr. Jerome S. Tobis, Professor and Director, Physical Medicine and Rehabilitation, New York University College of Medicine, whose personal, professional, and intellectual stimulation facilitated my maturation as a clinician and teacher; Eleanor T. Silverman, my wife and colleague whose professional advice as a speech and hearing consultant and whose contributions are so generously distributed throughout the fabric of the text; Dr. Harold K. Addelston, Dr. I. Kenneth Adisman, Dr. Elmer E. Baker, Jr., Dr. Gerson Cohen, Dr. Arthur Davidoff, Dr. Albert A. Krevitt, Dr. Lloyd S. Landa, Dr. Irwin W. Scopp, Dr. Herbert Sherman, Dr. Sidney Sorrin, and Dr. Nathan Wachtel, my associates and friends at the New York University College of Dentistry; Dr. Seymour Fradin, whose illustrations bring to the text, in addition to outstanding technique, the insight of an academically oriented clinician; and Beatrice G. Mandell, my secretary and hygienist, whose loyal and diligent assistance expedited the publication of this text.

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