A Textbook of Preventive Dentistry

Second Edition

RICHARD E. STALLARD, D.D.S., Ph.D.

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Preface
to the Second Edition

Tremendous changes have occurred in the dental profession in general and preventive dentistry in particular since the conception of the first edition of this text. These have been brought about by both technological advances and economic readjustments that have resulted in alterations in the mode of practice, increased third party insurance plans, capitation dentistry, retail dentistry, and a reassignment of values by patients concerning prevention. These factors combined with the inflationary spiral and the current economic downturn bring home some of the predictions made by Dr. Robert Caldwell in the paper presented at the Eastman Dental Center over 10 years ago. At that time the wheels were already turning in the area of capitation grants for dental schools to increase the number of dentists to meet the perceived need for dental care without consideration of demand and other factors that have come to play in the late 1970s and early 1980s. Dr. Caldwell correctly prophesied that we would need fewer dentists in the future as the total effect of preventive dental measures—particularly communal water fluoridation, stabilization of population growth, and the increased productivity of the individual dentists through expanded-duty dental auxiliaries—was felt.

During this period of rapid increase in number of dental care providers, little if any effort has been devoted to changing the attitudes of the public and thereby increasing the demand for dental care. With the increase in consumerism and other pressures it is now apparent that dentists must change their philosophy from one of "selling" their services to one of "marketing" their services. Preventive dentistry is ideal for this approach, as preventive dental procedures, if marketed properly, fulfill a perceived need in the patient's mind and effectively control the cost of dentistry.

All the factors currently affecting dentistry throughout the world should not be looked upon as prophesies of gloom and doom for our profession but rather as challenges that if met properly through preventive dentistry will lead to a bright future for all members of our profession.

R.E.S.

Preface
to the First Edition

This text on preventive dentistry is intended to provide a base on which current concepts can be utilized by those members of the dental profession dedicated to the preservation of the natural dentition. Each subject unit is treated in detail and is in turn linked to the other units to provide a total picture of prevention as it can be practiced today. Both clinical and research data are included upon which sound judgment can be made. Additional reading lists accompany each chapter for those who desire to expand their knowledge in a given area.

I am indebted to all of the contributors to this text for their patience and understanding during the protracted period of preparation resulting, ultimately, in publication. Chapters have been updated and additional references added to include the most current materials available in all areas. I am also indebted to the staff at Saunders for their cooperation and utmost care in preparing the material. Special appreciation is extended to Mrs. Pamela Phillips for her secretarial assistance.

My thanks and appreciation are extended to Mrs. Marge Caldwell for her encouragement, initially to her late husband and finally to me, during all phases of preparation of this book. I am especially grateful to my wife, Jaxon, for her continuing support.

RICHARD E. STALLARD
Minneapolis, Minnesota

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CHAPTER ONE

Introduction to Preventive Dentistry

Robert G. Jones, D.D.S.

DISCOVERY OF THE MICROSCOPE

Some three hundred years ago, Antony Van Leeuwenhoek ground a dual convex lens and scraped some material from the mouth of an 8-year-old boy. Thus he viewed for the first time the bacterial world that occupies the oral cavity.

In a short twenty years, the scientists of the day stated that the microscope had outlived its usefulness. This ridicule by so-called scientific authorities who were venting their egotism and greed has caused most medical discoveries to lie dormant for years and even centuries.

Antony Van Leeuwenhoek has generally been credited with inventing the microscope. He did not invent it, but he improved it. He found that a single lens was much better than the compound lens microscopes that were generally in use. He was not trained in any scientific way, but he made his own microscopes. Having no education or background, his work was ridiculed by the so-called scientific establishment.

Today, he is looked on as the father of bacteriology and protozoology, but why have three centuries come and gone before his work was used to rid humanity of the diseases that have plagued us?

THE MICROSCOPIC WORLD OF MAN

The microscopic world that Leeuwenhoek discovered in its natural living motile state was destroyed by the compound microscope and the necessity to stain and kill the organisms. It was not until the fourth decade of this century that a German by the name of Cerni invented the phase contrast microscope, which allowed the observation of the microscopic world in its natural living state. Yet today, most pathologists are not using it, simply because they were not trained in its use.

The human body is a wonderful creation and was obviously meant to survive indefinitely. The microscopic organisms surrounding us were not created to bring disease to man but are used in the cycle of life, and man lived in harmony with them for centuries, oblivious of their existence.

RESISTANCE TO DISEASE

The human body was created with two methods of surviving in the environment. The first is passive resistance. As generations lived and died, the body reacted to the environment and remained healthy. This gradually acquired resistance was inherited through genes, and evidence seems to indicate that breast feeding is one of the methods that nature used. The second is active resistance, which comes into play when a disease-producing substance or organism is introduced into the body. The body reacts by producing antibodies that either destroy or nullify the effects of the toxic substance or organisms.

DISEASE

Pathologic disease is caused in three distinct ways, the body normally having a

resistance level that keeps it healthy in its environment. This is the natural law, and it must be violated for a disease to occur.

The first way in which an organism may have a chance to infect the body occurs when there is a lowering of resistance caused by violating the natural laws of nutrition, exercise, breast feeding, and environmental protection from heat, cold, and moisture. When the effect of disobeying one or more natural laws lowers the resistance to the point that man cannot live in the normal environment that surrounds him, then disease is produced. The second means by which disease is produced occurs when man changes his environment so that toxic substances or organisms are introduced into the body in such quantities that the normal resistance level is unable to control it. Disease can also be produced in a third way: by being carried to a culture that has never had the disease and who have no built-in resistance to it. A perfect example of this was the great plagues that ravaged humanity when means of traveling great distances were devised.

The Plains Indians of America are also a good example of disease spreading to a nonimmune culture. They were not defeated by the U.S. Cavalry but by respiratory disease that was unknown in their culture. Thus they had no resistance to it and the White Death (tuberculosis) decimated them.

ROLE OF CIVILIZATION

So-called civilization is responsible for a great amount of the disease found throughout the world. Investigation of primitive people living in the world today, untouched by civilization, shows that they are totally free of many of the diseases that plague civilized man, and any attempt to civilize them, no matter how well intended (such as through missionaries), usually brings some of the diseases of civilization to them.

Teeth are the most indestructible part of the human body when exposed to the environment. Paleontology is almost entirely a study of teeth, because they are the only remaining thing left after being exposed to the environment for centuries. But civilization, through its ignorance of natural laws, has devised ways of destroying them during the normal span of a lifetime.

ACQUISITION OF KNOWLEDGE

The profession of dentistry was born when dental disease became prevalent enough that one man started giving it some of his time and thought, and thus the search for knowledge of dental disease was started. Knowledge is acquired in three distinct stages. There is the stage of ignorance with awareness that the problem exists, and there is a search for answers with anything that can be devised. Thus witch doctors, soothsayers, and "gods" were all called upon to free man from the problems that plagued him. This gradually brings him to the scientific stage, which is the organized accumulation of knowledge on a particular subject. Usually this results in a man-made method of treating the disease or surgically removing the diseased part. Unfortunately, greed and egotism are fed in this stage, and practitioners of the art will do almost anything to discredit any attempt at elevating it to the next stage.

The final stage comes when man recognizes the natural laws that have been violated and disseminates the information so that anyone wanting to escape the disease can do so.

A perfect example of these stages can be found in the form of childhood diseases such as typhoid fever, which was fatal to so many young children in the first three decades of this century. The ignorant stage was when anything and everything was done. If the temperature went up, they tried to lower it. If the temperature went down, they tried to raise it. The same attempts were made with hot and cold foods. Then drugs were used that would accomplish this, and finally it was left up to the "gods."

The scientific stage came into being when it was found that one could give the patient an attenuated dose of the disease, and then his body would build antibodies that would protect it when he was exposed to a lethal dose.

The final stage came when it was discov-

ered that the water supplies were stored unnaturally and that the typhoid bacillus was growing in numbers that exceeded the level of resistance in the body. Thus, sanitation laws were written and implemented, and typhoid fever is unknown and unseen by physicians today in the countries that have adopted these sanitation methods. This disease is still taking the lives of children in countries that violate these natural laws in ignorance.

DENTAL DISEASE

Dental disease is no different from those just mentioned, and it occurs because of a violation of natural laws.

Periodontal disease is such a slow process that it was accepted as a normal result of aging. Thus it was neglected during the state of ignorance. The first stage of gingivitis, which results in painful and bleeding gums, was not recognized as periodontal disease. Various medicaments were used in an attempt to alleviate the symptoms.

The man-made scientific stage began when dentists observed that calculus and pockets formed, thus gradually loosening the teeth. Calculus was named as the culprit, and the pockets were eliminated surgically. Although this did nothing to stop the disease, it was largely taught and practiced until a few years ago.

The final stage came when it was recognized that we have weakened our resistance to the point that we cannot live with the normal bacterial flora found in mouths throughout the world. Primitive natives have been found to have this same bacterial flora, but the natural resistance they have is such that these organisms are nondestructive. Civilized man has lost that resistance. He cannot correct this, since it is now known that the disease is caused by absorption of the waste products produced by the bacterial flora found in the zoogleal mass adhering to the teeth. The only alternative left to man is to remove or disrupt the zoogleal mass at intervals and prevent the absorption of the toxic waste products, thus preventing the progress of the disease.

Knowledge of dental caries has followed the stages mentioned, but because caries is visible when holes appear in the teeth, it was recognized earlier. Man, in his ignorance, tried every kind of cure, such as painting them with herbal stains, medicaments, and bitter drugs. When these approaches did not work, he turned to witch doctors and the "gods."

The scientific or man-made solution came when man surgically removed the diseased part and attempted to restore it to function by filling it with various metals or other materials. This did nothing to stop the onslaught of the disease, and ultimately, the teeth were removed and replaced by artificial ones. Full dentures were the result. In his ignorance, the dentist told patients that some people have soft teeth or that it is hereditary, and there was nothing that could be done about it.

The final stage has been brought about by the observation that caries occurs when products such as refined sugar are introduced into the mouth, and the waste products produced when they are ingested by the bacterial flora cause a dissolution of the tooth structure. Most natural sugars that occur in nature are not degradable to caries-producing waste products. The worst offender seems to be refined sugar produced from sugar cane or other products. When ingested, the bacterial flora of the mouth act upon it and produce waste products that bring about the dissolution of the tooth structure.

This has left civilized man with two solutions for escaping dental caries. One, he can eliminate cariogenic products from his diet. This is the way that primitive natives escape dental caries. He can also escape it by oral hygiene that removes or disrupts the accumulation of waste products on the surface of the teeth before the destructive process occurs.

This is the state and stage of dental knowledge to date, and it is the truth as we know it now. This does not mean it will be the ultimate truth, but it is all we have to go with now.

THE GOAL OF DENTISTRY

The supreme goal of the dental profession should be to eliminate the need for its own existence. To do this, we must correct

some dental definitions that were made in ignorance in the so-called scientific stage. Dental caries is not a cavity in a tooth. It is a symptom of long-standing disease. Dental caries is a bacterial-chemical reaction that takes place on the surface of a healthy tooth and, if left undisturbed long enough, will produce the cavity.

Periodontal disease is not a pocket measured with a probe. This is a symptom of long-standing periodontal disease. Periodontal disease is an inflammatory reaction that occurs when the waste products of the normal bacterial flora found in the mouth are absorbed by the mucous membrane at the gingival crevice. The pocket is formed by the natural protective reaction of the gingival attachment mechanism to maintain its integrity and prevent a bacterial invasion into the body.

These are the definitions we are going to retrain ourselves to use when we attempt to free our patients from these diseases. Otherwise, we will continue to run "filling stations" as we have been taught to do.

GREAT MEDICAL DISCOVERIES

Who and what kind of men have given the world its great medical discoveries? Is there a common denominator that can be found? I believe there is, after sitting at the feet of Leeuwenhoek through the writings of his contemporaries and historians that followed him. They found that on examining and using his microscope they did not see the things he did. Could it be that they were blind to what was before their eyes, blinded by the vanity and greed of experts? We look with our eyes, but we see with our minds.

Could it be that these experts refused to see things with their minds because if they did see it, it would demonstrate the ignorance they had been teaching and promulgating in the past, thus taking a blow to their vanity that they could not accept?

The final conclusion that the many people who have studied Leeuwenhoek's life and work came to was that he had a different way of observing what he saw than they did. I believe that this was the ultimate truth about him. But I believe the reason he had a "different way of observing what he saw" was that he was not blinded by vanity or greed. He never accepted any honor or money for what he did. When asked about his work, he pleaded ignorance and lack of education, and was only concerned with observing the natural world in its true state.

I have been privileged to sit at the feet of and learn from two men who contributed more to the cause of human health in this century than any other men.

Sir Alexander Fleming, a Scottish bacteriologist, gave the world penicillin in 1929, but he was ridiculed and scorned by the so-called scientific world, and because of their antagonism, penicillin was not accepted and used until 10 or 15 years later. It weighed very heavily on him that so many humans suffered and died during this time.

When I asked about his discovery of penicillin, he stated that *Penicillium notatum* was the mold responsible for ruining more bacterial experiments than any other cause, and he was taught to throw them out and start over. This he did for many years until one day he got tired of it and decided to observe this green mold that was such a nuisance. When he did, he observed that the pathologic organisms that he was trying to grow gave it a wide berth. Thus he gave the world penicillin, because he, like Leeuwenhoek "observed what he saw in a different way from other men." He was continually amazed that the thousands of men who had observed this phenomena before him had not seen the same thing.

Dr. Charles C. Bass, the youngest man ever to serve as dean of a medical school, was appointed to that position at Tulane. Hookworm was a disease that was endemic throughout the south. The childhood diseases of typhoid fever, whooping cough, and diphtheria were exacting a deadly toll in human life. He loved to hunt quail as a boy growing up in Mississippi, and looked on their rapid disappearance as not only a loss of personal pleasure, but a loss to humanity and nature. The Tulane Dental School was also under his jurisdiction, and the continual removal and replacement of teeth appalled him.

These phenomena were unacceptable to him, and he refused to believe the experts as to their cause. He saw the lack of results in their efforts to alleviate them. He promptly went back east and studied the microscope and its use. Then he carried the first one west of the Mississippi River.

He then carefully used it to "observe these phenomena in a different way." As a result, he wiped out hookworm in the south. He wrote the sanitation laws for New Orleans, and they were copied all over the world, thus stamping out the many childhood diseases. He wrote a book on the diseases of quail in an effort to preserve them. He was unable to get anyone in the dental school interested in preserving the natural dentition, so he promptly closed it.

He then turned his microscope on dental disease, and in 1943, he published an article simply stating that both caries and periodontal disease were caused by the waste products of the bacterial flora found in the zoogleal mass on the surfaces of teeth. He then proceeded to write down the optimum characteristics of a toothbrush and dental floss that would most effectively remove them and demonstrated the methods of how a toothbrush and floss should be used.

His work was met with antagonism and ridicule by the dental profession, and experts of the day continued to write books and teach that calculus, food impaction, and architecture were the causative agents. This nonsense was taught to me in dental school.

A CHALLENGE TO THE DENTAL PROFESSION

In the following chapters of this book you will be exposed to the latest accumulated knowledge of how and why dental disease occurs. It is my hope that some of you will be stimulated to use and add to that knowledge and thus bring dentistry closer to its supreme goal — to remove the necessity for its own existence.

The men that I have mentioned here, along with the other men throughout the centuries that have made medical discoveries, are now referred to as great men. But after studying and learning of their lives and work, I am convinced that there are no great men. Humanity has great problems, and ordinary men who are willing to "observe them in a different way" solve them. Thus the greatness of the problems rubs off on them.

The problems faced by humanity today involve every field of human endeavor. It is my hope that one or more of the men and women who read this book will look at the world around them, see these problems, then take off the blinding glasses of ego and greed, and "observe them in a different way."