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The Art and Science of Dentistry (1965)

American Dental Association

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Recommended Citation

American Dental Association, "The Art and Science of Dentistry (1965)" (1965). *Patient Dental Health Education Brochures*. 77.

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The ART
and SCIENCE
of DENTISTRY



The collected knowledge and skills in the realm of dentistry constitute a science. The application of the science of dentistry in practice is an art. We, therefore, speak of the science and the art of dentistry as we speak of the science and art of medicine. The opportunities in dentistry are to be found both in its science and in its art.

—Dr. Harry Lyons, Dean, School of Dentistry, Medical College of Virginia, Richmond.

Dental diseases are as old as mankind. However, neither his remains nor his tools suggest that early man attempted to treat oral diseases.



The practice of dentistry did start a few thousand years ago. The Egyptians, the Etruscans, the Phoenicians, the Greeks and the Romans all had physicians who treated dental problems.

Over the centuries many individuals made contributions to dentistry. However, it was only in the last century that dentistry began to be generally regarded as a science and a profession. Today's dentist is educated both in the basic sciences and in the techniques of his profession. Scientific research has made it possible for the modern dentist to treat (often to prevent) the dental diseases that have plagued man from the beginning of his existence.



The first dental college in the world, the Baltimore College of Dental Surgery, opened in 1840 with a faculty of four and a student body of five. There were no admission requirements. The curriculum consisted of two lecture courses of four months each, plus some training in a practicing dentist's office.

Today a young man or woman must have a minimum of two years (and often takes three or four years) of pre-professional education in an accredited college to enter a dental school. Then he attends dental school for four years to obtain the degree of D.D.S. (doctor of dental surgery) or D.M.D. (doctor of dental medicine). These degrees are considered identical.

Approximately 3,200 students are now graduated each year from the nation's 49 dental schools.

The dental student studies the basic sciences: anatomy, bacteriology, biochemistry, histology, pathology, pharmacology and physiology. While doing clinical work, he learns about diagnosis, dental materials, endodontics, operative dentistry, oral anatomy and surgery, orthodontics and other related clinical subjects. His third area of study includes the history of dentistry, practice management, ethics and law.

The dental schools in this country regularly schedule refresher and continuing educa-





tion courses for dentists. This method of learning about current research and new techniques helps the dentist carry on his dental practice more efficiently and competently. The dental schools offer more courses each year. A number of schools have separate plants and buildings devoted to helping keep the practicing dentist aware of the new concepts in the profession.

Dentists also continue their education by reading professional publications, watching special closed circuit television programs on dentistry and attending local, state, national and international dental meetings.

When a dentist receives his degree, he is qualified to treat all oral diseases. But, just as in medicine, some dentists choose to take further education and become specialists.

To become a specialist, a dentist must fulfill prescribed advanced educational requirements before announcing to the public the limitation of his practice. A specialist, if he chooses and is qualified by education and experience, may become a diplomate of one of eight national certifying boards for special areas recognized by the American Dental Association.

An increasing number of dentists (about one in eight), after their graduation from dental school, are taking internships and residencies in hospitals. The dental graduate who accepts a dental internship (or, following his internship, a residency) is appointed to the house staff of a general or a special hospital, just as a medical graduate is.

The dental intern receives advanced clinical experience and additional training in the sciences basic for dental practice.

The dental resident achieves proficiency in a specialized field of practice or research and the educational background for continued development in a special field. The type of patients available in hospitals for teaching purposes, the accessibility to



clinical and laboratory facilities and the opportunity for the integration of dental treatment with the total health care of the patient provide an excellent opportunity for advanced training in some specialty areas.

The dentist's primary purpose is to preserve the patient's ability to chew and to speak. He also is concerned with the importance of esthetics—that is, with the appearance of the patient's face and mouth.

The dentist's first task is to diagnose the patient's oral condition and to make an individual treatment plan for him. The patient's general health will help determine the treatment he needs. In addition to a thorough clinical examination, the dentist may use x-ray examinations, laboratory tests for susceptibility to tooth decay, study models, microscopic examination of tissues and many other aids to diagnosis.

Perhaps his patients are most familiar with the dentist as the doctor who restores teeth that have been attacked by the disease of dental caries.

Sometimes, if decay has progressed so far that the pulp (nerves and blood vessels in the center of the tooth) has been affected, the dentist must place a root canal filling. That is, he removes the pulp and replaces it with a suitable filling material.

Dentists treat periodontal diseases—that is, diseases of the gums, bones and other supporting tissues of the teeth. Without this treatment, the victim of periodontal disease eventually loses some, or possibly all, of his teeth.

A prophylaxis (cleaning of the teeth) by a dentist or a dental hygienist at regular intervals is one of the most effective ways of preventing periodontal disease. Calculus accumulating on the teeth irritates the gums. It can be removed only by a dentist or a hygienist, using special instruments.

Where the drinking water contains less than the optimum amount of fluoride (1 part fluoride per million parts water), the dentist may suggest applying a fluoride solution to a child's teeth at regular intervals. This affords some protection against tooth decay.

When a community begins fluoridating its water supply, topical fluoride applications ought to be continued for children who have not had the benefit of drinking fluoridated water since birth.



As one of the means of preventing dental disease—or rather of detecting it at an early stage so that it can be prevented from becoming more serious—the dentist takes x-ray pictures at regular intervals. These pictures

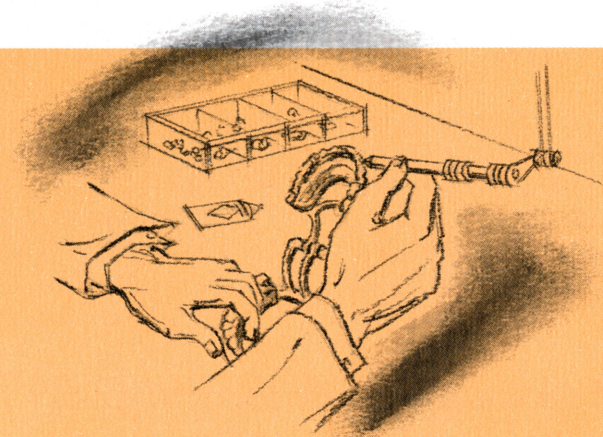


reveal cavities between the teeth, under old fillings and in other hidden spots. They show bone loss in periodontal disease, impacted (unerupted) teeth, abnormalities of tooth roots and many other conditions not visible to the eye alone. In short, the x-ray examination provides the dentist with information that makes it possible to diagnose and treat dental defects more effectively.

The primary task of the dentist is not to remove and replace teeth but to preserve them. Sometimes, however, dental disease progresses to the point where removal is the only possibility. Sometimes it also is necessary for a dentist to remove a primary tooth that has remained in a child's mouth too

long and must be removed to make room for the permanent tooth. Impacted teeth, which cannot erupt normally into the mouth because there is no space for them, also must be extracted. (Wisdom teeth are the ones most often impacted.)

If a tooth is lost because of neglected decay, periodontal disease or accident, the dentist can construct a replacement, either a fixed or a removable bridge. Constructing a bridge for a patient's mouth requires engineering skill similar to that needed for designing a bridge across a river, in addition to an understanding of the physiology and anatomy of the mouth.



A dentist's skills and knowledge are required to provide artificial dentures that will restore and maintain the harmony and appearance of the face, as well as assure the proper coming together of the teeth. The dentist makes impressions of the mouth and studies them in relation to the findings from his diagnostic examination. Then he

prepares an authorization or work order which gives complete instructions. This is sent to the dental laboratory with models and a prescription. Then the technician processes the dentures by following the dentist's instructions.

Often a dentist can prevent malocclusion ("crooked teeth") from developing. One way to do this is to help children keep their primary teeth until nature intended they should be lost. If malocclusion does develop, the dentist can use various methods to treat the condition.

When a dentist sees an abnormal area in a patient's mouth, he may take a smear for examination by an oral pathologist, or, if indicated, arrange for a biopsy to be taken for microscopic examination. Thus, regular dental examinations can help to save lives by leading to the early detection of oral cancer.

Dentists often are the first to suspect that a patient has an organic disease. Many diseases, such as diabetes and leukemia, have oral symptoms. When he finds symptoms of such diseases, the dentist refers the patient to a physician.

Many hospitals now have dental departments. Hospital patients may need treatment because of the oral as well as other symptoms of their diseases, or they may need dental treatment in addition to treatment for the condition for which they were hospitalized.



Some persons requiring multiple, or unusually difficult, extractions of teeth may prefer to have the surgery done under a general anesthetic. Or this may be advisable because of the patient's general health.

Often it is impossible for severely handicapped persons to have dental treatment except under general anesthesia. This is especially true of persons with diseases such as cerebral palsy who have limited control over their movements. The severity of the disease and the temperament of the patient usually determine whether he must be hospitalized for dental treatment.

The dentist is part of the team that repairs cleft lips and cleft palates and makes devices that enable children with cleft palates to eat, swallow and speak normally. Dentists also make many prosthetic devices for persons who have lost parts of their body because of cancer or of accidents.

Many dentists are devoting their lives to research, in the hope of discovering more about the causes, prevention and treatment of oral diseases. Dental research now includes investigations in many fields of biology, the physical sciences, biochemistry, physiology and radiobiology.

Private foundations and the government are making funds for dental research available to both institutions and individuals. Several independent scientific societies, such as the American Association for the Advancement of Science and the International Association for Dental Research, encourage and promote investigations of oral disease. Hospitals, government agencies and schools have well equipped dental research laboratories manned by thoroughly trained personnel.



Dentists teach in the country's 49 dental schools to help prepare the men and women who will be tomorrow's dentists. Some dentists devote full time to teaching, while others combine teaching with private practice.

A small number of dentists are in public health dentistry at the national, state or local level, working for the Public Health Service or serving as state dental directors or assistant directors, regional public health dentists, county dental directors or school dentists. Many dentists become career officers in the armed services.

Because they realize that dental health is a part of the individual's general health, many dentists are active in community health projects. Dentists have, of course, been particularly interested in campaigns for fluoridation of public water supplies. Individuals who have, from birth, drunk water containing 1 part per million of fluoride have up to 65 per cent less tooth decay throughout their lives.

Eight areas of specialization are recognized by the American Dental Association:

Pedodontics is the dental equivalent of pediatrics in medicine. The pedodontist treats all oral health conditions in the mouths of child patients except those requiring major orthodontic treatment or surgery.

Periodontics is concerned with the diagnosis and treatment of diseases which affect the gums and other structures surrounding and supporting the teeth. These are the periodontal diseases.

Orthodontics is concerned with the detection, study, prevention and correction of irregularities in tooth position and jaw relationship and deformities of the face produced by these conditions.

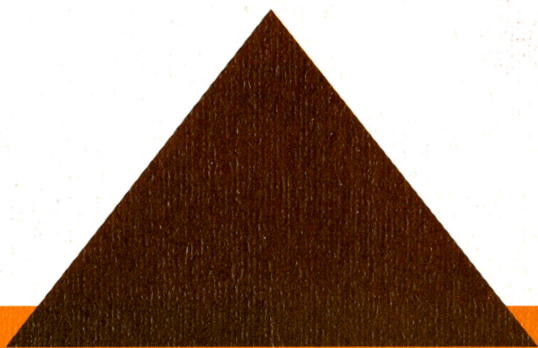
Prosthodontics involves the design and making of dental appliances and substitutes for natural teeth, such as crowns, bridges and dentures.

Oral surgery deals with the diagnosis, surgical and adjunctive treatment of the diseases, injuries and defects of the jaws and associated structures.

Oral pathology is concerned with the diagnosis of unusual diseased conditions of the mouth which dental practitioners have discovered.

Dental public health is that area of dentistry which seeks to prevent and control dental diseases on a community level and promotes dental health through public education and organized community efforts.

Endodontics is devoted to treating infections of the pulp (nerve and blood vessels) of a tooth and the conditions that develop at the tip of the root as a result of infection.



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