About Dentistry

What is Dentistry?

Dentistry is the branch of the healing arts and sciences devoted to maintaining the health of the teeth, gums, and other hard and soft tissues of the oral cavity. The absence of tooth decay, periodontal disease, malocclusion, oral-facial anomalies, and other oral disorders contributes to proper mastication and to normal speech and facial appearance. Early detection of oral cancer and systemic conditions that manifest themselves through the mouth are necessary for the maintenance of general health. In other words, the dentist is more than one who "fixes teeth". The dentist is a scientific practitioner dedicated to the highest standards of health through the prevention, diagnosis, and treatment of all oral diseases and conditions.

Summary of the Important Attributes of Dentistry:

1. Dentistry offers opportunities for creativity.
2. Dentistry offers and requires a strong artists' esthetic sense.
3. Dentistry offers professional flexibility.
4. Most dentists enjoy independence.
5. Dentistry offers work day flexibility.
6. Dentistry offers a good income.
7. Dentistry offers job security.
8. Dentistry offers career prestige.
9. Dentistry earns respect.
10. Dentistry offers variety.
11. Dentistry offers personal fulfillment.
12. Dentistry offers exceptional opportunities for women and minority groups.

Career Opportunities in Dentistry

A motivated person with scientific curiosity, intelligence, ambition, and social consciousness can find a rewarding career in dentistry. As a health professional, he or she will be highly regarded by the community and often called upon to provide community consultation and services. There are also monetary rewards in being a health professional. However, more basic than the social and financial rewards accorded to a dentist is the satisfaction the dentist experiences from his or her daily professional accomplishments.

There are now more than 172,000 dentists in the United States who are active in practice. This averages out to about 1 dentist per 1,200 persons. However, dentists are very unevenly distributed, and the average number of persons per dentist ranges from 1 in 1,100 in some states to 1 in 3,100 in others. Even in the best-supplied states there are often rural areas and inner-city areas of urban communities that are seriously under-served.

The age demographics of currently practicing dentists are important in considerations for the future of dentistry. A significant portion of today's dentists will be retiring in the next decade when the numbers of new dentists entering practice will not match those leaving the practice. Because of an institution's cost of educating a dentist is so high and is increasing, there has been little pressure to increase dental school enrollments.

Because dental diseases are rarely life threatening and dental care can therefore be postponed, the demand for dentists' services tends to fluctuate with changes in economic conditions. However, there is an increasing public awareness of the importance of oral health, and there are new mechanisms in place that make it easier for many people to finance the dental care they need. Dental prepayment insurance is one of these mechanisms. In the last decade and a half, the number of individuals covered by dental insurance has grown from less than five million to more than sixty million.

While more efficient practice methods, better utilization of auxiliary personnel, and improved prevention programs will undoubtedly enable the dentist of tomorrow to extend professional services to more patients, the

fact remains that a larger number of dentists will be needed in the years ahead if all segments of the population are to have access to the care they need.

Types of Careers for Dentists

The dental profession offers a variety of career options. Dentists may elect **general dentistry** or one of nine recognized **dental specialties**. They may establish their own private practice or be employed by other dentists or public or private agencies or institutions. The dentist may choose solo or group practice; group practice may involve working only with other dentists or with physicians and other health professionals in the provision of total health care. Career opportunities are also available in the armed forces. Some dentists serve as administrators or public health practitioners. Dental research and education offer further career opportunities to dentists. Some of these career possibilities are described below. Dentists earn either a D.M.D (Doctor of Dental Medicine) or D.D.S. (Doctor of Dental Surgery) degree.

General dentistry. About 80% of the active dentists are in general practice. The dentist in general practice brings his or her skills in oral diagnosis, prevention, and rehabilitation directly to the patient. The general practitioner is not only called upon to restore damaged or missing tooth structure, but can also provide a positive program of preventative oral health care. General practice offers great personal rewards through the elevation of the oral health of individual patients and permits the practitioner to maintain a strong sense of independence and individualism. Although not required, postdoctoral education in general practice residencies (GPR) or advanced education in general dentistry (AEGD) are available.

Specialty practices. The American Dental Association (ADA) currently recognizes nine dental specialties. Becoming a recognized specialist usually requires from two to four years of additional training beyond the dental degree, and, in most instances, practical experience in the specialty. Only a limited number of specialty residencies are available in the U.S. and entry into them are competitive and selective. There are about 17,000 recognized dental specialists in the U.S. Dental specialists are usually limited to practice in an urban setting since they are restricted by law in their practice of general dentistry and must therefore serve a higher client population requiring their services.

Dental Public Health includes the control and prevention of dental disease and the promotion of oral health through organized community efforts. It is the form of dental practice that treats the community rather than the individual as a patient.

Endodontics deals with the causes, diagnosis, prevention, and treatment of disease of the pulp and other dental tissues that affect the vitality of the teeth.

Oral and Maxillofacial Pathology is concerned with the nature of diseases of the mouth through study of their causes, processes, and effects. As a diagnostician, the oral pathologist does not necessarily treat the diseases directly, but may provide counsel and guidance to other specialists who do provide treatment.

Oral and Maxillofacial Surgery includes a broad scope of diagnostic, operative, and related services dealing with disease, injuries, and defects in the jaw and associated structures.

Oral and Maxillofacial Radiology. The most recently recognized specialty (1999). It will be several years before any dentists will be eligible to announce this specialty.

Orthodontics and Dentofacial Orthopedics is the science of tooth and oral structure development. The orthodontist treats problems related to irregular dental development, missing teeth, and other abnormalities in order to establish normal functioning and appearance.

Periodontics deals with diseases that affect the oral mucous membranes as well as other tissues that surround and support the teeth. Periodontology may be considered a clinical projection of oral pathology to include the treatment of the conditions named above.

Prosthodontics is the science and art of replacing missing natural teeth and associated structures with fixed or removable substitutes.

Pediatric Dentistry. Pediatric dentists specialize in treating children from birth to adolescence. They also treat disabled patients beyond the age of adolescence.

Education and research. An increasing number of dentists are pursuing careers in dental education and research. The changing character of dentistry reflects recent research findings. New drugs, new and improved dental restorative materials, high-speed dental equipment, water fluoridation, and scores of other dental developments of the recent past influence today's dental practice, and new discoveries will modify and improve dentistry in the years ahead.

Federal dental services. Many dentists serve the dental health needs of the nation's military personnel and assist the government in the design, administration, and execution of dental public health and research programs. Currently there are approximately 6,200 dentists in the commissioned dental corps of the U.S. Army, Navy, Air Force, and Public Health Service and in the Veterans Administration. Dentists are offered attractive incentives to become career officers in the uniformed services. Dentists employed in the civilian branches of federal, state, and local governments are frequently compensated at a level approximating that of their colleagues in private practice.

Other possible careers. Each year the horizons of dentistry expand, and new areas of dental service are created. There is a need for dental manpower in practice, industry, government, dental societies, national scientific organizations, and educational institutions.

Information on dental-related careers and various brochures (free) may be obtained by writing or accessing information at their web sites:

Council on Dental Education
American Dental Association
211 East Chicago Avenue
Chicago, IL 60611
http://www.ada.org

or

American Dental Education Association
1625 Massachusetts Avenue, NW.
Washington, DC 20036
http://www.adea.org

Dentistry - A Brief History of the Profession

The profession of dentistry shares a common origin with medicine. Many of the ancient medical documents and records contain references to dental diseases and their treatment. Egyptian records dating as far back as 3000 BC include sections on the treatment of dental diseases, although there is no mention of the removal of teeth or their replacement. The Phoenicians (1600-687 BC) were the first to devise and record methods of replacing missing teeth and retaining the replacements through the use of soldered gold bands or rivets. Improvements in this art were made by the Etruscans (753-300 BC), who lived in central Italy, and by the Greeks (377-162 BC), the Romans (450-218 BC), and the Arabians (700-1200 AD).

The first records of the separation of dentistry from the profession of medicine date from the thirteenth to the fifteenth centuries. Guy de Chauliac, a great surgeon of the Middle Ages, observed that operations on the teeth were properly the concern only of **barbers** and "dentatores." He made it clear that the "dentatores" of the fourteenth century were more than mere "tooth pullers", for they treated diseases of the teeth and surrounding tissues as well as the scant knowledge of the time permitted. Barbers also used common treatments of the day such as bloodletting (this is the origin of the red strip in the barber pole) and trepanning (the drilling of holes in the skull to let out evil spirits, a common practice in many ancient cultures). The recommended treatments were taken from the writings of Galen, an anatomist of the second century AD, and from the Arabian writers. The emigration of Greek scholars to Western Europe during this period added much to dental and medical knowledge. Many of the contributors to the science of medicine also contributed much to dentistry -- Vesalius, Fallopius, Eustachius, and Pare, to cite a few.

Pierre Fauchard (1670-1761) is considered to be the founder of modern scientific dentistry. His book *Le Chirugien Dentiste* records the then-current technical aspects of dentistry to which he contributed greatly.

John Hunter (1728-1793), an English physician, also wrote extensively on dentistry. Two of his best-known works are *The Natural History of Human Teeth* and *A Practical Treatise on Diseases of the Teeth*.

Dentistry in the United States had its beginnings in the latter part of the eighteenth century and was based on the dental knowledge of Western Europe. John Boher, an Englishman, was probably the first competent dentist to practice in this country. Another was John Greenwood, who was dentist to George Washington. George Washington possessed a pair of dentures made of wood that he commonly wore in public during his later years.

Dental Education in the United States had its beginning in Bainbridge, Ohio under the guidance of John Harris, who was preceptor to his brother, Chapin B. Harris, and to James Taylor. These men later formed the first recognized colleges of dentistry in the United States.

The year 1839 is memorable in dental history for the establishment of a dental journal, the organization of a dental society, and the application for a charter to open a school for training dentists. In 1840 the Baltimore College of Dental Surgery, the first of its kind in the world, opened its doors.

Rapid technical advances in dentistry occurred after 1850. Among these were the discovery of vulcanite as a denture base material; the development of gold foil, gold inlays, and amalgam as filling materials; the invention of the dental engine or mechanical drill; the use of X-ray films and local anesthesia. Two dentists, Drs. Horace Wells and W. G. T. Morton, first used general anesthesia in 1846 and are credited as being among the first to use a general anesthetic agent.

Under the leadership of **Dr. G. V. Black** (1836-1915), who next to Fauchard is the best-known figure in dentistry, dental education became truly scientific and professional. Dr. Black, who was dean of the dental school at Northwestern University in Chicago, performed brilliant research in anatomy and in the development of dental materials. He invented the foot-driven dental engine and his classification of cavity preparations, as well as many of the technical procedures he developed, are still used today.

After World War II, new advances in dental equipment (notably the air rotor), materials, research, and methods of practice made it possible for the dentist to be much more productive than before.

Facts about the Dental Profession

General characteristics of people who are attracted to, and suited for, the dental profession tend to be as follows: They have a social consciousness and want to help people. They have some interest and abilities in science. They like the idea of flexibility, hard work, and independence that can come from owning one's own business. They have good manual dexterity and like to create with their hands. They want to be part of a professions and share in the prestige and respect afforded to professionals. They are willing to invest in further education to achieve a worthwhile goal. They are interested in being a part of change and challenge occurring in professions responding to new technological advances and new social realities. They seek job security with a comfortable income. They are willing to accept the responsibilities of providing health care and working with patients and other individuals on a one-to one basis.

Educational requirements for dental school. Over 90% of accepted applicants have four years of college or a college degree. While no specific undergraduate major is required, about 80% are majors in one of the life sciences, about 15% in chemistry, and the remaining 5% in other majors. Regardless of the major chosen, a number of required courses must be included in the student's program: These include one year of English, two years of chemistry (2 semesters of inorganic and two semesters of organic chemistry), one year of physics, one to two year of biology, and various other science and non-science courses recommended by particular dental schools.

Dental applicants are not medical school rejects - only about 10% of dental applicants have applied to medical schools. Dentistry should never be considered as a substitute for medicine. Aver 90% of all dental students take

out loans to cover the majority of the expenses involved in dental school. The total debt of the graduating dental students is on the average about half of the annual net income of a practicing dentist. Minority students now comprise between 32.2% of the freshman entering class and are actively recruited. Women now comprise about 36.5% of the freshman entering class. Many dental schools, such as the University of Missouri, are approaching 50% women enrollment.

What are the rewards of dentistry? The average net income of a general dentist is now $178,000 per year (as of 2000). The average income of dentists is in the highest 8% of the population. 52% of a dentist's income is collected from dental insurance. Specialists average about $200,000 per year with orthodontists and oral surgeons earning well above the average. Some dental specialists have yearly net incomes of over $350,000. 50% of all dentists practice less than 40 hours per week. On the average, private practice dentists devote 36.9 hours in professional related activities including 33.2 hours per week in patient treatment.The hours in the workweeks shortens and yearly salaries tend to increase as the practice develops and the dentist ages Dental patient visits average 80 per dentist per 40 hour week (including hygiene appointments).

What Dental Schools Are Looking for in an Applicant - Nine Themes (see Sanders, pg 411, May 1996, Journal of Dental Education)

1. Community Orientation
2. Critical Thinking and Problem Solving
3. A Foundation in Science and the Scientific Method
4. Team Participation
5. Cultural Awareness
6. Demonstrated Psychomotor Ability
7. Formal Research Experience
8. Ethical Behavior and Motivation
9. Information Management

Applicants to dental school need to be competitive applicants who are above the minimum requirements for consideration. What applicant specifics are admission committees looking for in an applicant? Scores of not less than about 16 (the mean score is 17) on the sections of the Dental Admission Test (DAT), a solid score on the Perceptual Ability Portion of the DAT (mean 16.49), and a GPA of greater than 2.8 (mean is about 3.0 with considerations of science GPA and grade inflation status of institution. Students will higher DAT scores and higher GPAs have higher probabilities of acceptance than those on the lower end of the scale. Significant weight is the admission process is given to the personal interview, recommendations from predental advisors and teachers, and experience and visitations in dental offices outside of being a patient. The cost of dental education varies considerably among the 56 dental schools in the U.S. Six dental schools have closed in the last several years. At public-assisted dental schools the estimated four-year cost is over $60,000 for tuition, fees, books, supplies, and equipment. 94% of all dental students utilize some type of loan to finance their dental education. The average graduate leaves dental school with an average indebtedness of $118,00. In public institutions, non-resident students can be expected to pay about 50% more for tuition than resident students. All schools have a financial aid program through which a dental school education can be financed using a number of student aid and federally-funded programs and scholarships.

Applicants from unrepresentative minority (URM) groups are recruited actively by all dental schools. Many schools offer a number of financial resources to attract and recruit URM students into dentistry. Minority students should refer to the biennial publication: Opportunity for Minority Students in U.S. Dental Schools (OMSUSDS), obtained through the American Dental Education Association.

Additional Pointers For All Applicants to the Health Professions (with some emphasis for dentistry)

Various candidate attributes and considerations are used by Admissions Committees for any competitive admission to a health professional program:

1. **GPA**. Includes SGPA (science GPA) OGPA (overall GPA) and "last 30" or "last 60" hours GPA. The applicants GPA should be earned with evidence of a broad science and liberal arts education that includes the fine arts, business, mathematics, humanities, computer science, etc. Your GPA not only indicates your ability to handle an educational program but also indicates your attitude toward achieving consistent and high performance. Students of high ability, but low GPA performance, are "red flags". You must remember that the dental school curriculum is more demanding than those found in your undergraduate years. Dental schools want evidence you can handle the load and stress. Taking minimum loads as an undergraduate may cause admission committees to question whether a student can handle the rigorous course loads in dental school.
2. **Test Scores**. Your Admissions Test Scores (DAT, MCAT, OAT etc.) allow Admission Committees to rank you in comparison to all other applicants seeking admission. Without a major preparation effort, the student should consider the possibility that the re-take scores on admission examinations might turn out lower than the original scores.
3. **Commitment to Life-Long Learning**. What evidence is there that the applicant enjoys, accepts, and expects to be a continual learner? A comment often made by applicants about their excitement in "getting finished with the course work" and getting into the "real profession" can be revealing. Education for any profession is a life-long continuing activity.
4. **Credentials**. Letters of recommendations. Letters of recommendation are expected to be letters of evaluation that summarize the strong and weak points of an applicant with examples and indications of progress in recognizing and overcoming weak areas. Letters of recommendation should be consistent with impressions that are made during the interview. Letters of recommendation must be from credible and recognized sources, particularly those accustomed to evaluating applicants to health professional programs.
5. **Exposure to the Field**. Applicants must **demonstrate** enough of an exposure to the field to be knowledgeable of the role of the health care field they are entering. The best exposures involve enough contact "to smell, taste, and touch the activities of the profession", not just to visualize it. Applicants are expected to have sought out these experiences on their own, volunteering if necessary to become exposed to the professional day to day environment.
6. **Leadership**. This involves interest and participation in community, activities, and hobbies, especially those in which significant leadership roles have been taken.
7. **Writing Ability**. Are applicants able to communicate effectively and accurately? Are they careful in grammar, expression, and particularly spelling?
8. **Stamina/Endurance**. Have applicants demonstrated stamina and endurance in academics by taking full and demanding course undergraduate loads? Have applicants demonstrated emotional stamina and endurance in meeting the challenges of life? Do applicants possess the stamina and endurance to meet the demands of the professional program?
9. **Transferable Skills**. Transferable skills involve demonstrations of teamwork, organization, time management, speaking, writing, and social skills.
10. **Commitment to Community Service.** This involves not only what an applicant has demonstrated, but what has the applicant learned and how has the experiences molded their attitude.
11. **Evidence of Critical Thinking/Problem Solving Abilities.** What was the performance in courses requiring this skill such as laboratory segments or formal logic or in research experiences?

12. **Effective Time Management Skills.** Has the applicant demonstrated the ability to balance full academic schedules with extracurricular involvements and/or employment in an effective and efficient manner? Students should be careful when blaming outside activities for poor academic performance.

13. **Ability To Have Success With a Demanding Course Schedule.** The primary challenge for the first year professional program students is a very heavy course load during the first two years, probably heavier than any the student has had in their undergraduate program. Some admission committees consider the course loads of applicants. The student should be able to demonstrate that they can handle a demanding, heavy course load at the undergraduate level of up to 18 (or more) credit hours.

14. **Demonstration of Ability to Work at Intellectual Capacity.** Bright students often choose to work below their intellectual capacity. A grade of B or C in a course may indicate this characteristic to an admission committee. Tragically, when questioned, such students will offer the excuse that "they could have earned a grade of A if they had worked harder or wanted to". Such types of excuses can be very negative in the eyes of admission committee members. Students who have had "to work really hard to earn a B in that course" tend to be much more favorably considered.

15. **Personality and People Skills.** There is room for many types of individual personalities in dentistry, however, that personality must outwardly engage others and quickly instill confidence. There is often limited time to build a trusting relationship and initial impressions need to be strong to begin to build the confidence of patients and others. Patients are not as interested with what you know about your profession, but your interest in them and their problems. What kind of initial impression do you make? Many otherwise highly qualified applicants should be working on this attribute throughout their undergraduate years.

16 **Interview**. Do applicants show interest, sincerity, confidence, and expression? Do they provide answers to questions that they would have been expected to have considered earlier? Are applicants polite, present a comfortable and appropriate posture, and are appropriately dressed to show respect and awareness of the importance of the interview. Are gestures appropriate? Are applicants free of behavior or speech tics, such as tapping their foot and interspersing speech tics such as the "you know" into every remark? Do applicants demonstrate a knowledge of the activities, problems, and challenges of the world in which they live?

The American Student Dental Association (ASDA) and the Student National Dental Association (SNDA)

Eighty seven percent of all U.S. dental students belong to ASDA, a student affiliate of the American Dental Association, that protects and advances the rights and interests of dental students today. ASDA offers individual predental membership. Predental students can integrate knowledge and benefits that help them learn about dental school, the dental profession, and the application process. More information of these two organizations can be checked out at their websites: www.asdanet.org and www.sndaonline.org A quick Google search of "pre-dental clubs" will take you to numerous school sites where predental clubs have been organized.

Future Trends in Dentistry

Dentistry will continue to be a viable profession. Dental education will change over the next 15 years. More women will enter the profession and fewer dentists will go into solo practice. The dental caries (tooth decay) rate will continue to decline and developments in genetic engineering and immunology will have a large impact of the future practice of dentistry. Emphasis will shift from restoration to prevention. Composite materials will improve and dentists will routinely replace missing teeth with various types of implants, replants, and transplants. The demand for bridges will increase, but those for dentures should decrease. Public demand should increase as the generation conscious of the importance of dental health matures. More dentists will be involved in managed care, but penetration of managed care in dentistry will not reach the level it has in medicine. Most managed care in dentistry is of the Preferred Provider model. Research in dentistry will continue to increase among dental school faculty and in dental school curricula. In consideration of cost savings, several dental schools may begin to share most of the first two years of biomedical professional education with students enrolled in medical school programs when both are at the same university. Additionally, a fifth professional year

of "residency" for general dentists may tend to be added to the professional dental education curriculum within the next several years.

Debt Management and Financial Considerations:

Source: *Financial Planning Issues for Dental Students*, 2000, published by the American Dental Association.

The main sources of financial support for dental school are loans. The cost of a dental education has increased almost 82% since 1985. 93% of all dental students graduate with debt, the average being $97,961 (1999. The average debt in public assisted schools is about $80,216 and private schools is about $133,956. 42.2% of all graduates have a debt of over $100,000. The more a student borrows now, the more of their future earnings will be needed to repay the loan. Over 63% of recent graduates surveyed indicated that their educational debt affected their practice options. It takes an average of $174,192 to start a practice. The borrowed amounts and compounding of interest is a primary factor that will affect the total repayment amount, the monthly repayment amount, and the repayment period.

Example 1: A student graduates from dental school with a $65,000 debt that is to be repaid over a ten-year period at a rate of 8%. The monthly payment turns out to be $788.45. This amount repays the principal and interest as it accumulates on the loan. After ten years, the total repayment amount is $94,614 of which $29,614 is interest.

Example 2: A student graduates from dental school with a $85,000 debt which is to be repaid over a ten year period at a rate of 8%. The monthly payment turns out to be $1,031.05. This amount repays the principal and interest as it accumulates on the loan. After ten years, the total repayment amount is $123,726 of which $38,726 is interest. Note that an additional $20,000 of debt resulted in $9,112 more in interest over the life of the loan.

There are a number of strategies for managing student debt. (1). Borrow the least amount that you possibly need. (2) Pursue family or relatives who might be willing to lend you money at rates lower than student loans. (3) Explore student loan consolidation as a way of reducing or increasing monthly repayment totals. (4) Explore smaller repayments in early years with larger payments over time. (5) Explore service-connected repayment programs by practicing in designated service loan repayment areas. (6) Repay the principal of the loans as soon as you can. (7) Look into part-time jobs to assist in funding.