

Dentistry

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Dentistry is a branch of medicine that is involved in the study, diagnosis, prevention, and treatment of diseases, disorders and conditions of the oral cavity, commonly in the dentition but also the oral mucosa, and of adjacent and related structures and tissues, particularly in the maxillofacial (jaw and facial) area.^[2]

Although primarily associated with teeth among the general public, the field of dentistry or dental medicine is not limited to teeth but includes other aspects of the craniofacial complex including the temporomandibular and other supporting structures. The term dentistry comes from **odontology** (from Ancient Greek ὀδοῦς (odoús, "tooth")) – the study of the structure, development, and abnormalities of the teeth. Because of their substantial overlap in concept, dentistry is often also understood to subsume the now largely defunct medical specialty of stomatology (the study of the mouth and its disorders and diseases) for which reason the two terms are used interchangeably in certain regions.

Dentistry is important for overall health. Dental treatment is carried out by the dental team, which often consists of a dentist and dental auxiliaries (dental assistants, dental hygienists, dental technicians, and dental therapists). Most dentists work in private practices (primary care), although some work in dental hospitals and hospitals (secondary care) and institutions (prisons, armed forces bases, etc.).

The history of dentistry is almost as ancient as the history of humanity and civilization with the earliest evidence dating from 7000 BC. Remains from the early Harappan periods of the Indus Valley Civilization (c. 3300 BC) show evidence of teeth having been drilled dating back 9,000 years.^[3] It is thought that dental surgery was the first specialization from medicine.^[4]

Dentistry

Intervention

ICD- 23 (<http://icd9cm.chrisendres.com/index.php?srchtype=procs&srchtext=23&Submit=Search&action=search>)
9-CM -24 (<http://icd9cm.chrisendres.com/index.php?srchtype=procs&srchtext=24&Submit=Search&action=search>)
MeSH D003813



A dentist treats a patient with the help of a dental assistant.

Occupation

Names Dentist · dental surgeon* doctor
[1][nb 1]

Occupation type Profession

Activity sectors Health care and cosmesis

Description

Competencies Analytic skills · communication and interpersonal skills · craftsmanship · design skills ·

Contents

- 1 Dental treatment
- 2 Education and licensing
- 3 Specialties
- 4 History
 - 4.1 Modern dentistry
- 5 Priority patients
- 6 See also
- 7 Notes
- 8 References
- 9 External links

critical thinking · empathy ·
 manual dexterity · professionalism
 · team working

Education required Dental Degree, Medical Degree

Related jobs Physician · dental assistant · dental technician · various dental specialists

Dental treatment

Dentistry usually encompasses very important practices related to the oral cavity. Oral diseases are major public health problems due to their high incidence and prevalence across the globe with the disadvantaged affected more than other socio-economic groups.^[5]

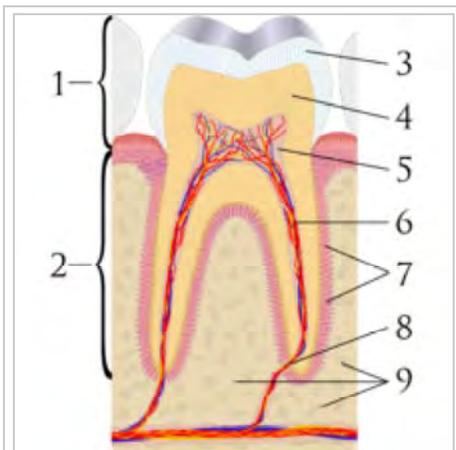
The majority of dental treatments are carried out to prevent or treat the two most common oral diseases which are dental caries (tooth decay) and periodontal disease (gum disease or pyorrhea). Common treatments involve the restoration of teeth, extraction or surgical removal of teeth, scaling and root planing and endodontic root canal treatment.

All dentists in the United States undergo at least three years of undergraduate studies, but nearly all complete a bachelor's degree. This schooling is followed by four years of dental school to qualify as a "Doctor of Dental Surgery" (DDS) or "Doctor of Dental Medicine" (DMD). Dentists need to complete additional qualifications or continuing education to carry out more complex treatments such as sedation, oral and maxillofacial surgery, and dental implants.

By nature of their general training they can carry out the majority of dental treatments such as restorative (fillings, crowns, bridges), prosthetic (dentures), endodontic (root canal) therapy, periodontal (gum) therapy, and extraction of teeth, as well as



An oral surgeon and dental assistant removing a wisdom tooth



A sagittal cross-section of a molar tooth; 1: crown, 2: root, 3: enamel, 4: dentin and dentin tubules, 5: pulp chamber, 6: blood vessels and nerve,

performing examinations, radiographs (x-rays) and diagnosis. Dentists can also prescribe medications such as antibiotics, sedatives, and any other drugs used in patient management.

7: periodontal ligament, 8: apex and periapical region, 9: alveolar bone

Dentists also encourage prevention of oral diseases through proper hygiene and regular, twice yearly, checkups for professional cleaning and evaluation. Conditions in the oral cavity may be indicative of systemic diseases such as osteoporosis, diabetes, or cancer. Many studies have also shown that gum disease is associated with an increased risk of diabetes, heart disease, and preterm birth. The concept that oral health can affect systemic health and disease is referred to as "oral-systemic health".

Education and licensing

Dr. John M. Harris started the world's first dental school in Bainbridge, Ohio, and helped to establish dentistry as a health profession. It opened on 21 February 1828, and today is a dental museum.^[6] The first dental college, Baltimore College of Dental Surgery, opened in Baltimore, Maryland, USA in 1840. The second in the United States was the Philadelphia College of Dental Surgery, established in 1852.^[7] In 1907, Temple University accepted a bid to incorporate the school.

Studies showed that dentists graduated from different countries,^[8] or even from different dental schools in one country,^[9] may have different clinical decisions for the same clinical condition.

For example, dentists graduated from Israeli dental schools may recommend more often for the removal of asymptomatic impacted third molar (wisdom teeth) than dentists graduated from Latin American or Eastern European dental schools.^[10]

In the United Kingdom, the 1878 British Dentists Act and 1879 Dentists Register limited the title of "dentist" and "dental surgeon" to qualified and registered practitioners.^{[11][12]} However, others could legally describe themselves as "dental experts" or "dental consultants".^[13] The practice of dentistry in the United Kingdom became fully regulated with the 1921 Dentists Act, which required the registration of anyone practising dentistry.^[14] The British Dental Association, formed in 1880 with Sir John Tomes as president, played a major role in prosecuting dentists practising illegally.^[11]

In Korea, Taiwan, Japan, Finland, Sweden, Brazil, Chile, the United States, and Canada, a dentist is a healthcare professional qualified to practice dentistry after graduating with a degree of either Doctor of Dental Surgery (DDS) or Doctor of Dental Medicine (DMD). This is equivalent to the Bachelor of Dental Surgery/Baccalaureus Dentalis Chirurgiae (BDS, BDent, BChD, BDS_c) that is awarded in the UK and British Commonwealth countries. In most western countries, to become a qualified dentist one must usually complete at least four years of postgraduate study;^[15] within the European Union the education has to be at least five years. Dentists usually complete between five and eight years of post-secondary education before practising. Though not mandatory, many dentists choose to complete an internship or residency focusing on specific aspects of dental care after they have received their dental degree.



Early dental chair in Pioneer West Museum in Shamrock, Texas

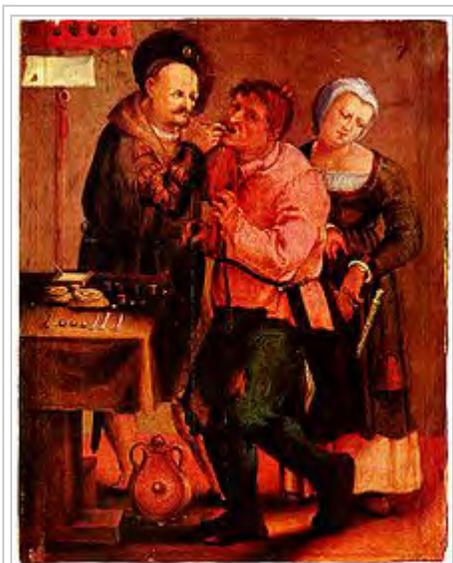
Specialties

Some dentists undertake further training after their initial degree in order to specialize. Exactly which subjects are recognized by dental registration bodies varies according to location. Examples include:

- Dental public health – The study of epidemiology and social health policies relevant to oral health
- Conservative dentistry and endodontics: The art and science of restoring the tooth form and function when destructed by carious and non carious lesions affecting the teeth, before involvement of pulp or root canal is termed as conservative dentistry. When the root canal are involved, the speciality is known as endodontics. This speciality degree is awarded in India
- Endodontics (also called endodontology) – Root canal therapy and study of diseases of the dental pulp and periapical tissues.
- Forensic odontology – The gathering and use of dental evidence in law. This may be performed by any dentist with experience or training in this field. The function of the forensic dentist is primarily documentation and verification of identity.
- Geriatric dentistry or Geriodontics – The delivery of dental care to older adults involving the diagnosis, prevention, and treatment of problems associated with normal aging and age-related diseases as part of an interdisciplinary team with other health care professionals.
- Oral and maxillofacial pathology – The study, diagnosis, and sometimes the treatment of oral and maxillofacial related diseases.
- Oral and maxillofacial radiology – The study and radiologic interpretation of oral and maxillofacial diseases.
- Oral and maxillofacial surgery (also called oral surgery) – Extractions, implants, and surgery of the jaws, mouth and face.^[nb 2]
- Oral biology – Research in dental and craniofacial biology
- Oral Implantology – The art and science of replacing extracted teeth with dental implants.
- Oral medicine – The clinical evaluation and diagnosis of oral mucosal diseases
- Orthodontics and dentofacial orthopedics – The straightening of teeth and modification of midface and mandibular growth.
- Pediatric dentistry (also called pedodontics) – Dentistry for children
- Periodontology (also called periodontics) – The study and treatment of diseases of the periodontium (non-surgical and surgical) as well as placement and maintenance of dental implants
- Prosthodontics (also called prosthetic dentistry) – Dentures, bridges and the restoration of implants. Some prosthodontists further their training in "oral and maxillofacial prosthodontics", which is the discipline concerned with the replacement of missing facial structures, such as ears, eyes, noses, etc.
- Special needs dentistry (also called special care dentistry) – Dentistry for those with developmental and acquired disabilities.
- Veterinary dentistry, a speciality of veterinary medicine – The field of dentistry applied to the care of animals.^{[16][17]}

History

Tooth decay was low in pre-agricultural societies, the growth in farming society about 10,000 years ago correlated with an increase with the rate of cavities.^[18] An infected tooth from Italy partially cleaned with flint tools, between 13,820 and 14,160 years old, represents the oldest known dentistry.^[19] The Indus Valley Civilization (IVC) has yielded evidence of dentistry being practised as far back as 7000 BC.^[20] An IVC site in Mehrgarh indicates that this form of dentistry involved curing tooth related disorders with bow drills operated, perhaps, by skilled bead crafters.^[3] The reconstruction of this ancient form of dentistry showed that the methods used were reliable and effective.^[21] The earliest dental filling, made of beeswax, was discovered in Slovenia and dates from 6500 years ago.^[22]



Farmer at the dentist, Johann Liss, c. 1616–17

A Sumerian text from 5000 BC describes a "tooth worm" as the cause of dental caries.^[23] Evidence of this belief has also been found in ancient India, Egypt, Japan, and China. The legend of the worm is also found in the writings of Homer, and as late as the 14th century AD the surgeon Guy de Chauliac still promoted the belief that worms cause tooth decay.^[24]

Recipes for the treatment of toothache, infections and loose teeth are spread throughout the Ebers Papyrus, Kahun Papyri, Brugsch Papyrus, and Hearst papyrus of Ancient Egypt.^[25] The Edwin Smith Papyrus, written in the 17th century BC but which may reflect previous manuscripts from as early as 3000 BC, discusses the treatment of dislocated or fractured jaws.^{[25][26]} In the 18th century BC, the Code of Hammurabi referenced dental extraction twice as it related to punishment.^[27] Examination of the remains of some ancient Egyptians and Greco-Romans reveals early attempts at dental prosthetics.^[28] However, it is possible the

prosthetics were prepared after death for aesthetic reasons.^[25]

Ancient Greek scholars Hippocrates and Aristotle wrote about dentistry, including the eruption pattern of teeth, treating decayed teeth and gum disease, extracting teeth with forceps, and using wires to stabilize loose teeth and fractured jaws.^[29] Some say the first use of dental appliances or bridges comes from the Etruscans from as early as 700 BC.^[30] In ancient Egypt, Hesi-Re is the first named "dentist" (greatest of the teeth). The Egyptians bound replacement teeth together with gold wire. Roman medical writer Cornelius Celsus wrote extensively of oral diseases as well as dental treatments such as narcotic-containing emollients and astringents.^{[31][32]} The earliest dental amalgams were first documented in a Tang Dynasty medical text written by the Chinese physician Su Kung in 659, and appeared in Germany in 1528.^{[33][34]}

Historically, dental extractions have been used to treat a variety of illnesses. During the Middle Ages and throughout the 19th century, dentistry was not a profession in itself, and often dental procedures were performed by barbers or general physicians. Barbers usually limited their practice to extracting teeth which alleviated pain and associated chronic tooth infection. Instruments used for dental extractions date back several centuries. In the 14th century, Guy de Chauliac invented the dental pelican

^[35] (resembling a pelican's beak) which was used to perform dental extractions up until the late 18th century. The pelican was replaced by the dental key^[35] which, in turn, was replaced by modern forceps in the 20th century.

The first book focused solely on dentistry was the "Artzney Buchlein" in 1530,^[29] and the first dental textbook written in English was called "Operator for the Teeth" by Charles Allen in 1685.^[12]

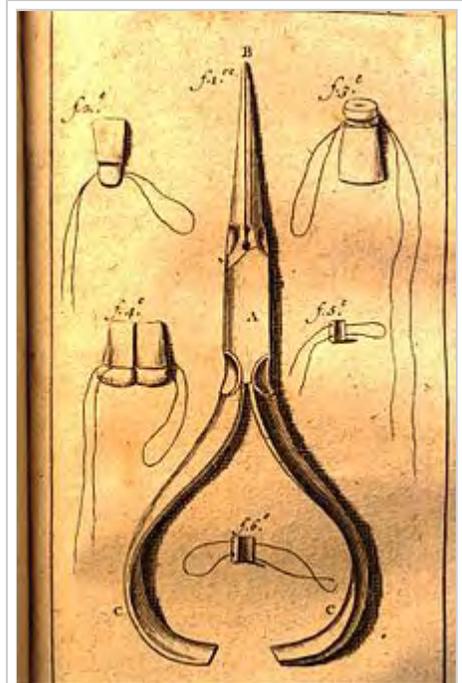
In the United Kingdom there was no formal qualification for the providers of dental treatment until 1859 and it was only in 1921 that the practice of dentistry was limited to those who were professionally qualified. The Royal Commission on the National Health Service in 1979 reported that there were then more than twice as many registered dentists per 10,000 population in the UK than there were in 1921.^[36]

Modern dentistry

It was between 1650 and 1800 that the science of modern dentistry developed. The English physician Thomas Browne in his *A Letter to a Friend* (c. 1656 pub. 1690) made an early dental observation with characteristic humour:

The Egyptian Mummies that I have seen, have had their Mouths open, and somewhat gaping, which affordeth a good opportunity to view and observe their Teeth, wherein 'tis not easie to find any wanting or decayed: and therefore in Egypt, where one Man practised but one Operation, or the Diseases but of single Parts, it must needs be a barren Profession to confine unto that of drawing of Teeth, and little better than to have been Tooth-drawer unto King Pyrrhus, who had but two in his Head.

The French surgeon Pierre Fauchard became known as the "father of modern dentistry". Despite the limitations of the primitive surgical instruments during the late 17th and early 18th century, Fauchard was a highly skilled surgeon who made remarkable improvisations of dental instruments, often adapting tools from watch makers, jewelers and even barbers, that he



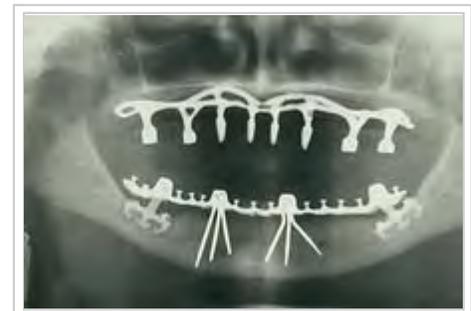
Dental needle-nose pliers designed by Fauchard in the late 17th century to use in prosthodontics



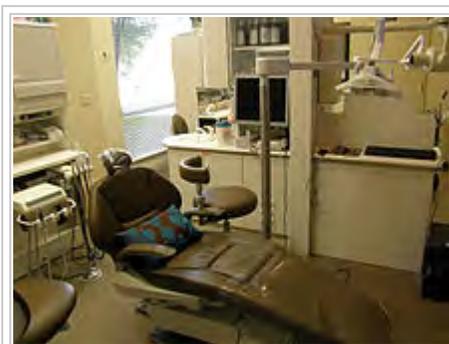
A microscopic device used in dental analysis, c. 1900

thought could be used in dentistry. He introduced dental fillings as treatment for dental cavities. He asserted that sugar derivate acids like tartaric acid were responsible for dental decay, and also suggested that tumors surrounding the teeth and in the gums could appear in the later stages of tooth decay.^{[37][38]}

Fauchard was the pioneer of dental prosthesis, and he discovered many methods to replace lost teeth. He suggested that substitutes could be made from carved blocks of ivory or bone. He also introduced dental braces, although they were initially made of gold, he discovered that the teeth position could be corrected as the teeth would follow the pattern of the wires. Waxed linen or silk threads were usually employed to fasten the braces. His contributions to the world of dental science consist primarily of his 1728 publication *Le chirurgien dentiste* or *The Surgeon Dentist*. The French text included "basic oral anatomy and function, dental construction, and various operative and restorative techniques, and effectively separated dentistry from the wider category of surgery".^{[37][38]}



Panoramic radiograph of historic dental implants, made 1978



A modern Dentist's chair

After Fauchard, the study of dentistry rapidly expanded. Two important books, *Natural History of Human Teeth* (1771) and *Practical Treatise on the Diseases of the Teeth* (1778), were published by British surgeon John Hunter. In 1763 he entered into a period of collaboration with the London-based dentist James Spence. He began to theorise about the possibility of tooth transplants from one person to another. He realised that the chances of an (initially, at least) successful tooth transplant would be improved if the donor tooth was as fresh as possible and was matched for size with the recipient. These principles are still used in the transplantation of internal organs. Hunter conducted a series of pioneering operations, in which he

attempted a tooth transplant. Although the donated teeth never properly bonded with the recipients' gums, one of Hunter's patients stated that he had three which lasted for six years, a remarkable achievement for the period.^[39]

Major advances were made in the 19th century, and dentistry evolved from a trade to a profession. The profession came under government regulation by the end of the 19th century. In the UK the Dentist Act was passed in 1878 and the British Dental Association formed in 1879. In the same year, Francis Brodie Imlach was the first ever dentist to be elected President of the Royal College of Surgeons (Edinburgh), raising dentistry onto a par with clinical surgery for the first time.^[40]

Priority patients

UK NHS priority patients include patients with congenital abnormalities (such as cleft palates and hypodontia), patients who have suffered orofacial trauma and those being treated for cancer in the head and neck region. These are treated in a multidisciplinary team approach with other hospital based dental

specialities orthodontics and maxillofacial surgery. Other priority patients include those with infections (either third molars or necrotic teeth) or avulsed permanent teeth, as well as patients with a history of smoking or smokeless tobacco with ulcers in the oral cavity.

See also

- List of dental organizations

Notes

- Whether Dentists are referred to as "Doctor" is subject to geographic variation. For example, they are called "Doctor" in the USA. In the UK, dentists have traditionally been referred to as "Mister" as they identified themselves with barber surgeons more than physicians (as do surgeons in the UK, see Surgeon#Titles). However more UK dentists now refer to themselves as "Doctor", although this is generally viewed as misleading by the British public (see Costley and Fawcett 2010).
- The scope of Oral and maxillofacial surgery is variable. In some countries, both a medical and dental degree is required for training, and the scope includes head and neck oncology and craniofacial deformity.

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External links

- Dentistry (<https://www.dmoz.org/Health/Dentistry/>) at DMOZ



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