Introduction to Dental Assisting

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The Dental Assisting Profession

CHAPTER OUTLINE

Introduction
History of Dentistry
  Early History
  Middle Ages
  Renaissance
  Dentistry in America
  Dentistry Around the World
  Contemporary Trends in Dentistry

History of Dental Assisting
History of Dental Hygiene
Women and Minorities in Dentistry
Education in Dental Professions
  Dentists
  Dental Assistants
  Dental Hygienists
  Dental Laboratory Technicians

Professional Organizations
  Certification

CHAPTER CHECKLIST

On completion of this chapter, students will be able to:

- Discuss the contributions various ancient civilizations made to the field of dentistry.
- Identify the major figures in the history of dentistry and describe their key achievements.
- Identify the educational requirements for the various members of the dental team.
- Identify major professional organizations in the field and describe their functions.
- Identify the requirements for becoming a certified dental assistant (CDA).

KEY TERMS

Albucasis (al-byuh-KA-sis) – noted Islamic physician (936–1013). In addition to his accomplishments as a surgeon, he identified tartar on the teeth as a major cause of gingival disease and wrote detailed instructions on how dentists could effectively scrape it away using special dental instruments he had designed.

American Dental Assistants Association (ADAA) – professional organization representing dental assistants on a national level.

American Dental Association (ADA) – the world’s largest and oldest professional organization dedicated to dentistry and dental health issues.

The American Dental Hygienists Association (ADHA) – largest professional organization representing the interest of dental hygienists.

cosmetic dentistry – branch of dentistry that deals with improving the appearance of otherwise healthy teeth.

dental assistant – dental professional trained to provide support to a dentist by performing a multitude of tasks ranging from clerical work and assistance at chairside to laboratory work, infection control, and possibly additional enhanced functions.

Dental Assisting National Board ( DANB) – agency that administers the national examination to certify dental and orthodontic assistants.

dental hygienist (hi-JEN-ist) – licensed, professional auxiliary in dentistry who is both an oral health educator and clinician.
and who uses preventive, therapeutic, and educational methods for the control of oral diseases

dental implant – a metal fixture typically made of titanium which is surgically embedded into the jaw. The implant acts as the root and allows for an abutment or prosthesis to be attached to it, such as a crown, bridge, or denture attachment

dental laboratory technician – dental professional who provides support to dental practices by filling prescriptions from dentists for crowns, bridges, dentures, and other dental prosthetics

dentistry – the science and art concerned with the prevention, diagnosis, and treatment of deformities, diseases, and injuries to the teeth, gingiva, oral cavity, and jaws

Pierre Fauchard (pee-AIR fee-SHARD) – 18th-century French physician who is known as “the Father of Modern Dentistry.” He described advanced techniques for cleaning the teeth and filling cavities in his comprehensive textbook on dentistry, Treatise on the Teeth (1723)

Isaac Greenwood – first American-born dentist

Hippocrates – ancient Greek physician (500 BCE) who is considered the father of modern medicine. Many fundamental concepts of modern medicine, including patient confidentiality and the ethical obligation to do no harm, can be traced to his early writings and teachings

Ambroise Paré (AME-broksh pah-RA) – 16th-century French surgeon who is considered the Father of Surgery. He wrote extensively on dental procedures, particularly extraction and replantation, in his Complete Works

restorative dentistry – branch of dentistry that deals with restoring or replacing damaged or missing teeth

veneer (vuh-NERE) – a thin layer of acrylic, composite, or porcelain used to cover the facial (front) surface of badly stained teeth or to improve the shape of highly visible front teeth

whitening – lightening of teeth to a whiter color by the use of dental bleaching materials

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Introduction

Dentistry is one of the world’s oldest medical arts. For thousands of years, people have tried to care for their teeth well enough to keep their mouths healthy and pain-free for a lifetime. The concerns of people through the ages have remained surprisingly similar, whereas the technology available for modern dental care continues to advance and better address those needs. As the profession has grown over the years, the roles and responsibilities for the various members of the dental team, including dental assistants, have become better defined. Formal education and a structured certification process ensure that patients receive quality care. A number of professional organizations exist to promote professional standards, advocate sound oral health care practices, and support members of the dental profession.

History of Dentistry

Early History

Some early dental practices were strikingly similar to our own and continue into the present day. For example, to help prevent tooth decay, or caries, the people in many early civilizations were urged to rinse their mouths after every meal. Some cultures even included the practice in religious rituals. Toothbrushes took many forms and were made of a wide assortment of materials, including animal hair and twigs. A surprising number of early dentists and doctors around the world explained caries and pain as products of a mysterious “toothworm.” Nearly all early civilizations frowned on pulling, or extracting, teeth, especially the cuspid, or “eye” teeth, and reserved the practice for a last resort. Each region of the world had its favorite materials for constructing the dentures used to replace lost teeth. Dentistry developed steadily as early peoples used whatever resources and knowledge were available to them. (See Table 1-1.)

Egypt

As early as 5,000 years ago, physicians in Egypt began to move from treating the entire human body into specializing in healing and treating specific parts of it. Some doctors specialized in the eyes, others in the stomach or head. Records remain of a physician named Hesi-Re, who was known to his colleagues as “chief of the toothers” and is recognized as the first known dentist. Evidence from Egyptian graves of that era shows that his patients suffered tooth and bone loss from gingival disease and had surgery to drain dental abscesses.

Greece

The ancient Greek physician Hippocrates, who lived around 500 BCE, raised the art of medicine to a high level. The ideals of modern medicine, including patient confidentiality and the ethical obligation to do no harm, can be traced to his early writings and teachings. Hippocrates is perhaps best-known for the Hippocratic Oath, which outlines the standards and ethical responsibilities of health care providers. A version of the Hippocratic Oath is still taken by many medical practitioners today (see Chapter 4, Ethics and Law). Like his predecessor, the famous Greek physician Aesculapius, Hippocrates appreciated the importance of teeth and devoted many pages of his writings to them. He rejected the use of magic to treat toothache and dental
<table>
<thead>
<tr>
<th>DATE</th>
<th>LOCATION</th>
<th>EVENT</th>
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<tbody>
<tr>
<td>2600s BCE</td>
<td>Egypt</td>
<td>First known dentist (Hesi-Re) practices</td>
</tr>
<tr>
<td>500–300 BCE</td>
<td>Greece</td>
<td>Aristotle and Hippocrates advance practice of medicine and dentistry</td>
</tr>
<tr>
<td>250 BCE</td>
<td>China</td>
<td>First cleft palate repair</td>
</tr>
<tr>
<td>25 BCE–50 CE</td>
<td>Rome</td>
<td>Celsus writes on oral health and dental treatments</td>
</tr>
<tr>
<td>166–201 CE</td>
<td>Etruria (Italy)</td>
<td>Etruscan artisans fashion notable bridgework and dentures</td>
</tr>
<tr>
<td>410</td>
<td>Rome</td>
<td>Fall of the Roman Empire; Middle Ages begin in Europe</td>
</tr>
<tr>
<td>500–1000 CE</td>
<td>Europe</td>
<td>Monks practice medicine, surgery, and dentistry</td>
</tr>
<tr>
<td>700</td>
<td>China</td>
<td>First mention of silver amalgam for treating caries</td>
</tr>
<tr>
<td>1000s</td>
<td>Islamic Spain</td>
<td>Albucasis describes how to remove tartar</td>
</tr>
<tr>
<td>1130–1163 CE</td>
<td>Europe</td>
<td>Pope forbids monks from practicing surgery or tooth extraction</td>
</tr>
<tr>
<td>1130–1163 CE</td>
<td>Europe</td>
<td>Barber surgeons take over practice of surgery and tooth extraction</td>
</tr>
<tr>
<td>1210 and onward</td>
<td>France</td>
<td>Barbers continue tooth extractions; other surgeons train for general surgery</td>
</tr>
<tr>
<td>1530</td>
<td>Germany</td>
<td>First book devoted to dentistry, <em>The Little Medicinal Book for All Kinds of Diseases and Infirmities of the Teeth</em>, published</td>
</tr>
<tr>
<td>1575</td>
<td>France</td>
<td>Ambroise Paré, Father of Surgery, includes writings on dentistry in his <em>Complete Works</em></td>
</tr>
<tr>
<td>1723</td>
<td>France</td>
<td>Pierre Fauchard, Father of Modern Dentistry, completes his textbook, <em>Treatise on the Teeth</em></td>
</tr>
<tr>
<td>1760</td>
<td>United States</td>
<td>Irish dentist John Baker immigrates from England to set up practice in America</td>
</tr>
<tr>
<td>1760–1780 CE</td>
<td>United States</td>
<td>Career of Isaac Greenwood, first American-born dentist</td>
</tr>
<tr>
<td>1768–1770 CE</td>
<td>United States</td>
<td>Boston silversmith Paul Revere enters dental practice</td>
</tr>
<tr>
<td>1789</td>
<td>France</td>
<td>First patent issued for porcelain teeth</td>
</tr>
<tr>
<td>1790</td>
<td>United States</td>
<td>First dental foot engine invented</td>
</tr>
<tr>
<td>1790</td>
<td>United States</td>
<td>First dental chair, with headrest and arm extension</td>
</tr>
<tr>
<td>1825</td>
<td>United States</td>
<td>Commercial manufacture of porcelain teeth begins</td>
</tr>
<tr>
<td>1832</td>
<td>United States</td>
<td>First reclining dental chair</td>
</tr>
<tr>
<td>1833–1850 CE</td>
<td>United States</td>
<td>First American use of amalgam restorations for dental caries</td>
</tr>
<tr>
<td>1840</td>
<td>Baltimore, Maryland</td>
<td>First dental college in the world founded</td>
</tr>
<tr>
<td>1841</td>
<td>Alabama</td>
<td>First laws regulating dental practice in the United States</td>
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<tr>
<td>1844</td>
<td>Connecticut</td>
<td>First use of nitrous oxide as an inhaled anesthetic</td>
</tr>
<tr>
<td>1864</td>
<td>United States</td>
<td>Rubber dental dam invented</td>
</tr>
<tr>
<td>1866</td>
<td>Ohio (College of Dental Surgery)</td>
<td>Lucy Beaman Hobbs becomes first woman to earn a dental degree</td>
</tr>
<tr>
<td>1869</td>
<td>Massachusetts (Harvard University Dental School)</td>
<td>Robert Tanner Freeman becomes first African American to earn a dental degree</td>
</tr>
<tr>
<td>1871</td>
<td>United States</td>
<td>First commercially manufactured foot-treadle dental engine</td>
</tr>
<tr>
<td>1877</td>
<td>United States</td>
<td>First pump-type hydraulic dental chair</td>
</tr>
<tr>
<td>1880</td>
<td>United States</td>
<td>First manufacture of tube toothpaste</td>
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</tbody>
</table>
Table 1-1: Timeline: Dental History (Continued)

<table>
<thead>
<tr>
<th>DATE</th>
<th>LOCATION</th>
<th>EVENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1885</td>
<td>New Orleans, Louisiana</td>
<td>C. Edmund Kells employs first female dental assistant, or “lady assistant”</td>
</tr>
<tr>
<td>1890</td>
<td>University of Michigan School of Dentistry</td>
<td>Ida Gray becomes first African American woman to earn a dental degree</td>
</tr>
<tr>
<td>1895</td>
<td>Germany</td>
<td>Physicist Wilhelm Roentgen discovers the x-ray</td>
</tr>
<tr>
<td>1905</td>
<td>Germany</td>
<td>Invention of Novocaine</td>
</tr>
<tr>
<td>1908</td>
<td>United States</td>
<td>Reformer and educator G.V. Black publishes <em>Operative Dentistry</em></td>
</tr>
<tr>
<td>1913</td>
<td>Bridgeport, Connecticut</td>
<td>Fones Clinic for Dental Hygienists opens</td>
</tr>
<tr>
<td>1917</td>
<td>Connecticut</td>
<td>Irene Newman receives first dental hygienist license</td>
</tr>
<tr>
<td>1924</td>
<td>United States</td>
<td>American Dental Assistants Association (ADAA) founded</td>
</tr>
<tr>
<td>1928</td>
<td>United States</td>
<td>National Board of Dental Examiners established</td>
</tr>
<tr>
<td>1938</td>
<td>United States</td>
<td>First toothbrush with synthetic bristles marketed</td>
</tr>
<tr>
<td>1945</td>
<td>United States</td>
<td>Fluoride first added to community water supplies</td>
</tr>
<tr>
<td>1947</td>
<td>United States</td>
<td>Dental Assisting National Board (DANB) established</td>
</tr>
<tr>
<td>1958</td>
<td>United States</td>
<td>First fully reclining dental chair</td>
</tr>
<tr>
<td>1989</td>
<td>United States</td>
<td>First commercial tooth bleaching products for home use</td>
</tr>
<tr>
<td>1990s</td>
<td>United States</td>
<td>Popularity of cosmetic aesthetic dentistry increases</td>
</tr>
</tbody>
</table>

Pain, and stressed a rational approach to medicine. His successor, Aristotle, continued to write on dentistry and connected the eating of figs and other soft sweets popular with Greeks to the development of caries.

**Etruscans**

The best examples of early restorative dentistry, or using dentures to replace missing teeth, can be found among the crowns and bridges made by Etruscan craftsmen in the hills of Central Italy about 2,500 years ago (Figure 1-1). Gold bands fastened natural teeth to artificial ones and calves' teeth were grooved in the center to appear as two central incisors, or front teeth. The Etruscans were eventually conquered by the Romans and absorbed into their empire.

**Rome**

Early Roman dentistry combined the medicine of the Greeks with the restorative dentistry of the Etruscans. Among the most famous Roman physicians, Celsus lived from 25 BCE to 50 CE. Like his Greek predecessor, Hippocrates, he rejected magic and believed that poor physical health in general caused dental caries and disease. For dental pain he prescribed narcotics and advocated use of the cautery, or hot iron, to sear and destroy diseased gingival tissue. He urged the extraction of badly broken down teeth and was among the first to recommend filling the tooth's cavity with lead prior to extraction to reduce the chance of fracturing the crown as it was pulled. He also described the earliest techniques for straightening and repositioning teeth.

Archigenus, who practiced medicine and dentistry in Rome after Celsus, recognized pulpitis, or the inflammation of the pulp of the tooth, as a source of pain, and invented the first dental drill that would allow access into the pulp chamber to treat it.

Galen, considered the greatest physician since Hippocrates, classified teeth into centrals, cuspids, and molars. He was the first to write about nerves in the teeth, believing them to be related, among other things, to the sense of taste. Along with pulpitis, he recognized periapicalitis, or inflammation of the radicular portion of the tooth, as a source of toothache.

Figure 1–1: An ancient Etruscan gold-banded bridge with two teeth. (Courtesy of National Museum of Science & Industry, London, UK.)
Hebrews
The Jewish scripture, the Talmud, written between 300 and 400 CE, describes false teeth made of gold, silver, and wood, and blames the mysterious “toothworm” for dental caries. Surviving Hebrew writings describe little more about dentistry.

China
The toothbrush as we know it today, with bristles sideways to the handle, was invented by the Chinese in the 1490s, but advanced treatments and practices began much earlier in China. Ancient manuscripts describe the repair of a cleft palate around 250 BCE. Dentists later combined mercury with silver to fill dental caries more than a thousand years before dentists in the West, and developed full dentures as early as the 12th century CE. In the 13th century, the explorer Marco Polo describes Chinese who, whether for cosmetic or treatment purposes, adorned their teeth with carefully fitted thin pieces of gold.

Japan
The earliest Japanese dentures were carved from a single piece of wood, usually a sweet-smelling variety, such as box, cherry, or apricot. Treatments for toothache included cautery and acupuncture as well as occasional use of charms and magic incantations. Extraction remained a last resort.

Islamic World
Physicians of the Islamic world, which, after the 8th century CE, included the Middle East, North Africa, and Spain, wrote widely on medicine, including dentistry. During Europe’s Middle Ages, they rejected magic and superstition as cures, and helped keep alive the rational approaches of the Greek physicians who had come before them. The noted Islamic physician Albucasis (936–1013) of the Spanish city of Córdoba understood that the accumulation of tartar on the teeth was a major cause of gingival disease and wrote detailed instructions on how dentists could effectively scrape it away using special dental instruments he had designed. Illustrations of these and other instruments, including forceps for surgery, cautery irons, and dental saws and files, were featured in his famous book on medicine and surgery, The Method.

The most famous Islamic physician, known in the West as Avicenna, stressed the importance of keeping the teeth clean and recommended various tooth powders for this purpose, including salt and powdered snail shells.

Popular toothbrushes called siwaks were made from twigs of the evergreen tree Salvadora persica (Figure 1-2). They retained the sodium bicarbonate, tannic acid, and other astringents found in the tree’s wood and proved beneficial to the gingiva. Using the toothbrush, as well as rinsing the mouth after meals and before prayer, was an important part of the cleanliness ritual advocated by Islamic religious authorities. Siwaks continue to be used in parts of the world today.

Middle Ages
After the Roman Empire fell in 410 CE, most Europeans adopted the practice of using magic and superstition to treat dental disease and pain and rejected the medically based approaches of the Greeks, Romans, and others. Sound European medical knowledge became the property of the monasteries, where monks became practicing doctors and dentists. Barbers acted as their assistants. When medieval Christian religious authorities in the 10th century declared that priests and monks must not participate in the cutting of the body and the shedding of blood during surgery, barbers took over the practice of surgery. Known as barber surgeons, these practitioners included tooth extraction among their surgical duties; outside the monastery walls, they were joined by “tooth drawers,” who traveled from one medieval town to another providing their services. Among the most famous of barber surgeons was Ambroise Paré, the 16th-century French surgeon considered the Father of Surgery, who wrote extensively on dental procedures, particularly extraction and reimplantation, in his Complete Works.

Renaissance
With the arrival of the Renaissance period in 16th-century Europe, magic and superstition began to fall out of favor as approaches to medicine and dentistry. Physicians and
dentists returned to the respect for science and learning that had characterized earlier periods and civilizations. Their careful observations of medical and dental techniques brought many new ideas to preventive care and innovations to dental surgery. The study of human anatomy took on more importance at universities and medical schools. Renaissance artists, such as Italy’s Leonardo da Vinci, drew the skeletal and muscular details of the human body with great accuracy. He studied the skull and all external and internal structures of the body very carefully. Though not trained as a doctor or dentist, he was the first anatomist to distinguish between premolars and molars.

**Pierre Fauchard** (Figure 1-3), an 18th-century French physician, became known as “the Father of Modern Dentistry.” He disputed the long-held belief that caries was caused by a “toothworm” and described advanced techniques for cleaning the teeth and filling caries in his comprehensive textbook on dentistry, *Treatise on the Teeth*, published in 1723. Led by his example, other dentists in Europe began describing and sharing their discoveries on dental surgery and care in articles and books published for their colleagues. Despite other advances in his thinking, Fauchard continued to advocate for the practice of people rinsing their mouths each morning with several tablespoons of their own fresh urine. Once widely practiced, this hygienic ritual continues today in some isolated regions of the world.

**CHECKPOINT**

1-2 When monks in 10th-century Europe were no longer able to practice surgery, which group became responsible for performing surgery and basic dental procedures?

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**Dentistry in America**

**Early American Dentistry**

Robert Wooffendale, a British-trained dentist, arrived in North America in 1766 and traveled throughout the American colonies. He offered surgical procedures and reconstruction of missing teeth. Wooffendale was followed by John Baker, an Irish physician who chose to practice dentistry. Baker set up practices in numerous colonial cities, including Philadelphia, New York, and Boston. He included George Washington among his patients.

Though he practiced a relatively short time, the most famous dentist of early America was undoubtedly the patriot and silversmith Paul Revere of Boston. Revere studied dentistry as an apprentice under John Baker in Boston. In 1768, when Baker moved to New York, Paul Revere took over his dental practice. His primary interest in dentistry, however, was the use of his skills as a silversmith to produce pontics and dental instruments. Despite eventually tiring of his practice, Revere left his mark on dental history by making the first forensic identification of a corpse using dental records. He identified the anonymous remains of a man killed at the Battle of Bunker Hill as a former patient for whom he had constructed a dental bridge some years earlier.

**Isaac Greenwood**, born in 1730, is considered the first American-born dentist. Like Paul Revere, he studied under John Baker in Boston. His son, John Greenwood, entered dental practice in New York following the Revolutionary War and served as another of George Washington’s dentists.

**Evolution of Modern Dentistry**

Dentistry as we know it today in the United States began to take shape in the early part of the 19th century. A patient of the New York dentist John Greenwood, Horace H. Hayden was inspired to become a dentist himself. He lectured to medical school students on dentistry and wrote dental textbooks and articles for professional journals. He and his student, Chapin A. Harris, established the first professional organization for dentists in the United States. In 1840, they founded the world’s first dental college, the Baltimore College of Dental Surgery, now the School of Dentistry at the University of Maryland.

**G.V. Black**

Born in 1836, Dr. Green Vardiman Black (Figure 1–4) became known worldwide as a dental reformer and
Inhalation Anesthesia

Horace Wells, a Connecticut dentist, first used nitrous oxide as an inhaled anesthetic, or painkiller, in 1844. His discovery revolutionized all surgeries, including dental surgery, which had previously relied on alcohol or opium or other equally troubling and ineffective methods to dull pain during surgery.

Wilhelm Conrad Roentgen (1845–1923)

Another of the most important discoveries in modern dentistry occurred just at the end of the 19th century when the German physicist Wilhelm Conrad Roentgen discovered the mysterious x-ray, or radiograph, in 1895. His discovery revolutionized medicine and forever changed how dental disease was detected and diagnosed. For a detailed look at Roentgen and his discovery, see Chapter 29, Basics of Dental Radiography.

Dentistry Around the World

Dental care and oral hygiene practices vary widely around the world. They may even vary between people who live in cities and towns and those in the countryside and among people from different economic backgrounds in the same country.

Many people around the world continue to practice habits first introduced by traditional healers or medical and religious authorities in the distant past. Basic preventive care, such as cleaning and regular examination, is not available everywhere. When dental caries and pain appear, professional dentists may not be locally available or treatment may be beyond the financial reach of some. American and British dentists working in Africa have described patients who had to travel more than 1,000 miles to reach adequate care when an oral infection had progressed into the bones of the jaw. Despite care, one patient lost all her lower teeth.

Getting access to dental care is harder in countries where the number of dentists is very low compared to the number of residents. In industrialized countries, such as the United States, Britain, Japan, and Australia, there may be 1 dentist for every 1,600 people. In countries with scarcer economic resources, such as many in Africa and Southeast Asia, there may be 1 dentist for every 119,000 people. To make matters worse, most professionally trained dentists in developing countries have settled in large urban population centers, although many residents continue to live in distant rural areas.

Dental Facts

India

In many areas of India, toothbrushes made from fresh twigs, with the ends frayed into fibers, are favored for daily brushing. Twigs are selected from specific trees according to the season of the year and the individual user’s temperament. Most brushes have a bitter taste and an astringent quality believed to be beneficial to the gingiva. After brushing their teeth, Indians traditionally use a curved silver instrument to scrape the tongue free of accumulated coatings and then rinse the mouth with water combined with specially selected herbs and spices.
To help provide as much access to dental care as possible, some countries have begun using community health nurses and other appropriately trained health care providers to provide a basic package of oral health care to people regardless of where they live. Ingredients of basic care may include pain relief, fluoride treatments, dental health education, and basic restorative treatments to fix caries and broken or damaged teeth.

**Contemporary Trends in Dentistry**

Patients today are more active participants in their own medical and dental treatment. Many make it a point to keep current on new developments in dental treatment, especially opportunities to maintain oral health and prevent dental disease from developing in the first place. Some patients have a particular interest in improving the appearance of otherwise healthy teeth, or they want to put the finishing touches on restorative dental work by seeking out the latest techniques in cosmetic dentistry. Cosmetic dentistry includes many techniques and procedures already practiced in dental offices, but begins by examining the patient’s entire oral cavity—including the shape, color, and structure of teeth—and working to improve overall appearance, or aesthetics. Television, advertising, and other visual media have a powerful influence over the expectations of many patients. Along with questions about brushing, flossing, rinsing, and other preventive measures for better dental health, you can expect to answer numerous patient questions about treatment options that have a purely cosmetic or aesthetic purpose.

**Whitening**

As we age, our teeth may appear increasingly stained or worn. Habits such as drinking tea or coffee and chewing or smoking tobacco can increase this appearance. Whitening, or bleaching, has become one of the most requested services provided in dental offices and is often performed by dental assistants. Whitening materials penetrate the tooth’s enamel into the dentin. A light source or heat is used to speed up the lightening process. Patients not interested in undergoing whitening treatments in the dental office may instead ask you about commercially available home whitening treatments. For more information on tooth whitening, see Chapter 46, Cosmetic Dentistry.

**Veneers**

Veneers are thin layers of acrylic, composite, or porcelain placed on the outer surface of the teeth to improve their appearance or shape. Their placement requires little if any removal of existing tooth structure, but may require some surface preparation before they are bonded in place. Some veneers require routine polishing and regular maintenance after they are placed; others are more durable. Resin and porcelain are two of the materials frequently used for veneers. For more information on veneers, see Chapter 38, Fixed Prosthodontics.

**Implants**

Dental implants are a popular method of replacing one or more missing teeth. Implants are metal devices surgically placed into the jaw bone and allowed to bond with the surrounding bone tissue over a period of 6 months. After successful bonding, the implant may be used to anchor in place a single crown, a bridge, or a partial or full denture. For a detailed look at dental implants, see Chapter 38, Fixed Prosthodontics.

**History of Dental Assisting**

Before the late 19th century, dentists sometimes hired men and boys to assist them in their practices. In 1885, a New Orleans dentist, C. Edmund Kells (1856–1928) (Figure 1-5),
became the first dentist to employ a female dental assistant. The public responded positively to his decision and other dentists followed his example. The first “lady assistants,” as they were originally known, made it more comfortable and respectable for women patients to visit a dental practice alone. The assistants began by helping with office duties and gradually moved into helping dentists chairside. This made it possible for dentists to increase the number of patients they saw and the amount of dentistry that their practice could perform. More and more dentists saw the value in employing assistants and began to train their own. In the 1930s, an accepted curriculum to train dental assistants began to emerge. In 1948, what is now the Dental Assisting National Board (DANB) was formed to recognize the professional competence and qualifications of trained dental assistants. In the 1950s, colleges and other institutions increased the number of programs available to train professional dental assistants.

**History of Dental Hygiene**

A dental assistant in Connecticut was the first person to be trained as a dental hygienist. In the early 1900s in Bridgeport, Irene Newman began to provide preventive care services under the supervision of Dr. Alfred C. Fones, who wanted to allow time in his practice for other procedures. Dr. Fones went on to found the School of Dental Hygiene that bears his name at the University of Bridgeport in 1913. Irene Newman became the first licensed dental hygienist in 1917.

**Women and Minorities in Dentistry**

Though women in the 18th century and early 19th century were not allowed to formally study for a career in dentistry, they nonetheless found ways to enter the profession and paved the way for the nearly 50% of dental students today who are women.

Emeline Roberts of Danielson, Connecticut, was the first woman to practice dentistry in the United States. After observing her husband practice dentistry, she studied basic science on her own and, in 1859, became her husband’s partner in his dental office. Upon his death in 1864, she took over his practice, supporting herself and her small children, and continued practicing dentistry for the next 60 years.

Lucy B. Hobbs-Taylor originally apprenticed with a male dentist in Cincinnati, Ohio. She later established two dental practices of her own. She remained determined, however, to enroll as a student at the Ohio College of Dental Surgery. Despite many obstacles, she persisted in her efforts and finally graduated in 1866, the first woman in the world to graduate from a dental school.

Robert Tanner Freeman earned a doctor of medical dentistry degree from Harvard University’s School of Dental Medicine in 1869, becoming the first African American to graduate from dental school. From the 1870s until educational desegregation in the 1950s, most African American dentists were educated at traditionally black Howard University in Washington, D.C., or at Meharry Medical College, a private medical school for black physicians in Nashville, Tennessee.

In 1890, Ida Gray became the first African American woman to graduate from a U.S. dental college. After her graduation from the University of Michigan’s School of Dentistry, she went on to practice dentistry in Chicago until her retirement in 1928.

**Education in Dental Professions**

**Dentists**

To practice dentistry in the United States, a dentist must graduate from an accredited dental school approved by the American Dental Association’s (ADA) Commission on Dental Accreditation (CODA). Dental education accreditation began in the early part of the 20th century and is intended to ensure the quality and continuous improvement of dental and dental-related education in the United States. Typically, a dentist completes an undergraduate education and goes on to study at a dental school, which includes both coursework and clinical practice on patients. When the dentist graduates, he or she receives either a doctor of dental surgery (DDS) or a doctor of medical dentistry (DMD) degree. Many dentists go on to additional specialist training. In addition to these requirements, dentists need to take and pass a national written exam and written and clinical exams in the states in which they plan to practice.

After obtaining a license to practice, most dentists go into general dentistry where they handle a wide variety of situations and patients. Other dentists choose to specialize in one of nine specialties. For more information about dental specialists, see Chapter 3, The Dental Office Team. Additional coursework and written and practical
out that way. I just did not have enough time to do a good job. Sometimes I skipped over the most important details, just because I thought I had already gone over them. Daniel came prepared. He completed the practical experience he needed for his degree at a big clinic downtown. He saw everything there and worked with children, older adults, people from other countries, people with less money, people with more money. He is comfortable with everyone and really knows how to get people to open up and talk with him. He knows what to expect and how to prepare for each type of procedure I do. I always know he will have everything ready before we start. He also keeps up on things. Last time he brushed up on his Continuing Education credits, he got to use what he had learned right away when I worked on a patient who had recently gone through a whole series of cosmetic procedures at another office. Daniel got the best training he could and set out to succeed at his job; he helps all the rest of us at the office succeed, too.

Voice of Experience

The best part of my job is meeting people. Sometimes that is the most challenging part, too, but it is always interesting. My patients come from all over the country and all over the world. No matter where they are from, I try to see them all as individuals. I tell myself I am helping to treat somebody’s grandmother or somebody else’s dad. When I work with people from another country, who are new to my town, I try to make them as comfortable as possible. I do not ask endless questions about where they are from and what the government is like there, for example. I do not ask about their accents. But I do try to find out how they feel about their teeth, how they take care of them, and whether they have pain and where. I try to find out how they brush their teeth, whether they floss, and if they are comfortable with mouthwash and what they use. I have gotten some strange answers from people, believe me. One person told me he preferred to keep brushing his teeth with the twigs and sticks he had grown up using. He did not like plastic and synthetic bristle tooth brushes. They felt too big and clumsy in his mouth and he missed the bittersweet taste of the wood twigs. I selected a smaller toothbrush for him that fit his mouth better and suggested he might like to try an herbal-flavored toothpaste. Whatever people tell me, I try to make them comfortable enough so that they’ll tell me more. When I suggest ways they could improve their care, I do it quietly and calmly. Working together, we can both feel more at home.

Dental Assistants

Most dental assistants acquire their training in community college, trade school, or technical institute training programs. Some dental assistants are trained in schools associated with the armed forces ADA’s CODA accredits more than 260 formal training programs across the country. An accredited training program for dental assistants includes both classroom and laboratory instruction in dental assisting skills. Students also gain practical experience in dental offices, clinics, and schools before they graduate. Completion of a 2-year program at a community or junior college may lead to an associate’s degree; most schools, including trade schools and technical institutes, offer a certificate or the ability to obtain licensure. Regulations regarding programs and degrees differ by state, so be sure to check the regulations in your area. Students may search for dental assisting programs accredited by CODA at www.ada.org/prof/ed/programs/search_index.asp.

American Dental Association
Commission on Dental Accreditation
211 East Chicago Avenue
Suite 1900
Chicago, Illinois 60611
telephone: 800-621-8099 or 312-440-4653
e-mail: accreditation@ada.org

Dental Hygienists

Dental hygienists provide preventive dental care by removing calculus, stains, and plaque from teeth, and by teaching patients about good oral hygiene. Additional responsibilities can include developing dental radiographs, applying fluoride treatments, and performing other patient care tasks.

In nearly all states, dental hygienists become licensed by graduating from a dental hygiene program accredited by the ADA’s CODA, and passing written and clinical examinations. Most accredited programs, such as many at junior or community colleges, lead to an associate degree. Others lead to a certificate or a bachelor’s degree. Some lead to a master’s degree. Graduates of 2- and 4-year programs who successfully complete their licensing examinations use the title registered dental hygienist (RDH) after their name (some states use the title LDH, which stands for licensed dental hygienist).

Dental Laboratory Technicians

Dental laboratory technicians, also known as dental technicians, provide support to dental practices by filling prescriptions from dentists for crowns, bridges, dentures, and other dental prosthetics. They customize each prescription according to models of the individual patient’s oral cavity, bite, and adjoining teeth. Dental
technicians are skilled artisans whose work is detailed and demanding. They may work for individual dentists or for dental laboratories. Some technicians train in business and management and go on to establish their own dental laboratories.

Formal training to become a dental technician varies greatly in length and in the level of skill acquired. Training programs are available through community and junior colleges, vocational-technical institutes, and through the armed forces. Some programs are accredited by CODA. These programs combine classroom and laboratory instruction with supervised practical work experience. Becoming a fully trained dental technician may take 3 to 4 years, but more on-the-job experience is required to become an accomplished technician. Dental laboratory technicians seeking credentials to reflect their qualifications and professional competence take and pass an examination to become certified dental technicians (CDTs).

Certification

Dental assistants who have graduated from an ADA-accredited educational program, or those who have completed 2 years of full-time or 4 years of part-time work experience as a dental assistant, may apply to take the certification examination to become a certified dental assistant (CDA) or certified orthodontic assistant (COA). Successful completion of the certification examination, given by the DANB, recognizes the dental assistant’s qualifications and professional competence. More than 30 states recognize or require DANB certification. Some states allow dental assistants to perform special expanded functions in the dental office, such as taking radiographs and performing other special procedures. These special tasks can only be performed by dental assistants who have completed additional training and passed a certification examination. Some states also require the dental assistant to obtain a license from the state radiological board or equivalent to perform additional procedures. Requirements and expanded functions vary from state to state. DANB administers examinations that qualify dental assistants to perform these expanded functions according to the regulations in their home state. For a list of requirements and allowed functions for your state, visit www.danb.org/main/statespecificinfo.asp.

All applicants for DANB certification must hold and maintain up-to-date certification in cardiopulmonary resuscitation (CPR). After successful completion of the examination, they must also complete Continuing Education credits each year to qualify for annual recertification. Certification examination schedules and other information are available at www.danb.org.

Professional Organizations

Founded in 1859, the American Dental Association (ADA) is the world’s largest and oldest professional organization dedicated to dentistry and dental health issues. Made up of dentists from all over the United States, the group works to advance professional standards and to promote good oral health practices for the public. Involved in the testing and rating of dental products, the ADA awards a seal of approval to items that it considers safe and effective. The ADA is also involved in establishing educational standards for dentists and other dental professionals. In addition, the group produces a monthly publication called the Journal of the American Dental Association. For more information, go to the ADA’s website at www.ada.org.

The American Dental Assistants Association (ADAA) is the oldest and largest organization in the United States representing professional dental assistants. It promotes the advancement of the profession in matters of education, legislation, credentialing, and professional activities and seeks to enhance the delivery of quality health care to the public. Statewide chapters exist in many states. See Chapter 2, Professionalism, for more information about the ADAA and its role in the education and professional development of dental assistants.

The American Dental Hygienists Association (ADHA) is the largest professional organization representing the interests of dental hygienists. It offers professional support and educational programs to advance the art and science of dental hygiene and to promote the highest standards of education and practice in the profession. Publications and other information are available at www.adha.org.

Check Your Ethics

You are assisting the dentist while he performs a radiographic procedure on a patient. The patient is correctly positioned, and the dentist is getting ready to take the radiograph when he is interrupted by the news that a patient has arrived who needs emergency dental care. The dentist asks you to finish taking the radiograph. You’ve been taking a class in radiography, and you know exactly what to do, but you also know that state law prevents you from performing this procedure without certification.

1. What would you do?
2. How do you explain your actions to the dentist?
3. What are the possible consequences if you perform the procedure?

Checkpoints

1–4 Name the division of the American Dental Association responsible for accrediting dental education programs.

1–5 What does “DANB” stand for?
Chapter Highlights

✦ Dentistry is one of the world’s oldest medical arts. Some early dental practices were strikingly similar to our own, including rinsing the mouth and using a toothbrush.
✦ The Egyptian physician Hesi-Re is believed to be the first dentist.
✦ The ancient Greek physician Hippocrates developed many concepts that are fundamental to medical practice today, including patient confidentiality and the ethical obligation to do no harm.
✦ Early Roman dentistry combined the medicine of the Greeks with the restorative dentistry of the Etruscans. Among the many advances during this time were the classification of teeth, the invention of the dental drill, and the use of narcotics to ease dental pain.
✦ In Europe in the 10th century, barbers took over the practice of surgery. Known as barber surgeons, these practitioners included tooth extraction among their medical duties.
✦ In the Renaissance period, beginning in the 16th century, European physicians and dentists returned to the respect for science and learning that had characterized earlier periods and civilizations. Their careful observations of medical and dental techniques brought many new ideas to preventive care and innovations to dental surgery.
✦ In the United States, dentistry as we know it today began to take shape in the early part of the 19th century. The first professional organization for dentists was founded, and the first dental college was established. The use of nitrous oxide as a painkiller and discovery of the x-ray further advanced the practice of dentistry.
✦ Dental care and oral hygiene practices vary widely around the world. Basic preventive care, such as cleaning and regular examination, is not available everywhere. Getting access to dental care is harder in countries where the number of dentists is very low compared to the number of residents.
✦ Cosmetic (or aesthetic) dentistry emphasizes improving the appearance of otherwise healthy teeth. Whitening, veneers, and implants are among the techniques used in this branch of dentistry.
✦ In the 19th century, dentists began hiring assistants to help them in their practices. By the 1930s an accepted curriculum to train dental assistants began to emerge. In 1948 what is now the Dental Assisting National Board (DANB) was formed to recognize the professional competence and qualifications of trained dental assistants.
✦ Dentists must pass written and practical licensing examinations and have a degree from a dental school accredited by the American Dental Association’s (ADA) Commission on Dental Accreditation (CODA).
✦ Most dental assistants acquire their training in community college, trade school, or technical institute training programs. Dental assistants who have graduated from a program accredited by the American Dental Association, or those who have completed 2 years of full-time or 4 years of part-time work experience as a dental assistant, may apply to take the certification examination to become a certified dental assistant (CDA) or certified orthodontic assistant (COA).
✦ In nearly all states, dental hygienists become licensed by graduating from a dental hygiene program accredited by the American Dental Association’s (ADA) Commission on Dental Accreditation (CODA) and passing written and clinical examinations.
✦ Formal training to become a dental technician varies greatly in length and in the level of skill acquired. Training programs are available through community and junior colleges, vocational-technical institutes, and through the armed forces. Dental laboratory technicians can take an examination to become certified dental technicians (CDTs).
✦ Professional organizations in the field of dentistry include the American Dental Association (ADA), American Dental Assistants Association (ADAA), and the American Dental Hygienists Association (ADHA).

Review Questions

1. The first known dentist, Hesi-Re, lived in
   a. Ancient Rome.
   b. Ancient Greece.
   c. Ancient Egypt.
   d. Medieval Paris.

2. Which of the following tasks is the responsibility of a dental lab technician?
   a. Making crowns
   b. Polishing teeth
   c. Removing calculus from teeth
   d. Processing test results
3. Thin layers of acrylic, composite, or porcelain used to cover the front surface of stained teeth are called
a. Sawiks.
b. Veneers.
c. Lacquers.
d. Bleachings.

4. The first toothbrush as we know it today, with bristles sideways to the handle, was invented in the 1490s by
a. The Italian explorer Marco Polo.
b. The Japanese.
c. The Chinese.
d. Renaissance artists.

5. Albucaasis, one of the best known physicians of Spain and the Islamic world, believed that the accumulation of tartar on the teeth was a major cause of
a. Discoloration of the teeth.
b. Gingival disease.
d. Mouth sores.

6. A primary role of a dental hygienist is
a. Removing calculus from teeth.
b. Designing dentures.
c. Updating patient records.
d. Assessing a patient’s bite.

7. The two most important discoveries of the 19th century to impact the practice of modern dentistry were
a. Fluoridation of water and fluoride toothpastes.
b. The invention of Novocaine and the rubber dental dam.

c. Inhalation anesthesia and the radiograph.
d. Amalgam restorations for dental caries and toothbrushes with synthetic bristles.

8. Which of the following has the least effect on access to dental care in developing countries?
   a. The number of residents versus dentists available.
b. Whether dentists tend to reside in the cities or the countryside.
c. Whether trained individuals other than dentists can provide basic care.
d. The attitudes of traditional healers toward professionally trained dentists.

9. Which of the following is not used to speed up the process of tooth whitening?
   a. Lasers.
b. Low-intensity heat.
c. Sealants on the surface of the teeth.
d. High-intensity light.

10. In addition to graduation from an accredited program in dental assisting, a certified dental assistant (CDA) must have completed
    a. 50 hours of community service in a neighborhood dental clinic.
b. The certification examination administered by the Dental Assisting National Board (DANB).
c. The certification examination administered by the assistant’s home state.
d. Additional training in one of the nine dental specialties.

Active Learning Exercises
1. Make a list of the professional dental organizations. Identify each organization’s founder and which profession’s members belong to each organization. Are these organizations still operating today?
2. Go online and research the necessary credentials for at least five surrounding states. Identify and list the requirements for Registration, Certification, Licensure or other credentialing.
3. What role does the dental laboratory technician play with regard to the dental office? Locate several technicians in your area and find out if they work independently or within a dental office.

Application Activities
1. Visit the website for the Dental Assisting National Board (DANB) to gather what information you can about your state’s requirements for dental assistants. List the dental assisting job titles that are available in your state and write a short summary listing the requirements for obtaining a license in each of the positions.
2. Select one of the professional organizations discussed in the chapter and locate several journals or other items published by the organization. Read the material and write a paragraph or two summarizing what you’ve learned. Be sure to consider how the organization could be used to expand your career opportunities. Be prepared to discuss your findings during the next class period.