THE HEALTHCARE INDUSTRY

SCENARIO

Carlos Santos, CMA, is a medical assisting instructor with 10 years' experience in the clinical area. He worked for a group of family practitioners and for an allergist during his career as a medical assistant before becoming an instructor. Mr. Santos believes that it is very important to give his students an overview of the history of medicine early in their training. He knows that it is exciting to show them the progress of medicine and to introduce students to the pioneers that contributed to the field. This helps the student to understand where he or she fits into the whole picture of a medical assistant. Often Mr. Santos assigns the students a short report on one person who played a role in the progress of medicine. He finds that this is a good way to encourage students to use the Internet and to conduct research right from the start of their training; the students get a chance to grow more comfortable speaking in front of a group. Mr. Santos knows that his students will develop an appreciation for those who gave so much to the medical profession, which will influence their own dedication to both peers and patients.

Mr. Santos knows that his students must recognize the different members of the healthcare team and their responsibilities. Once the students begin their externships, they will be able to work effectively with each person in the facility and understand each one's role in the treatment of patients. Mr. Santos also introduces them to the current types of facilities available for patient care on both a national and a local level. The knowledge the students gain about the different areas of patient care will be useful once they graduate and begin working in a healthcare facility. All of these skills will make Mr. Santos' students more versatile and valuable to their eventual employers.

While studying this chapter, think about the following questions:

- What recent events could be included as ground-breaking discoveries in medicine?
- Why is continuing medical research so important to the healthcare industry?
- How can the individual medical assistant contribute to the progress of medicine in today's world?
- What is the value of gaining an overview of the history of medicine as one begins a career in medical assisting?

LEARNING OBJECTIVES

1. Define, spell, and pronounce the terms listed in the vocabulary.
2. Identify the ancient cultures that contributed a major portion of our medical terminology.
3. Distinguish between and describe the two medical symbols in general use today.
4. Explain the history of medicine and how it has affected today's medical industry.
5. Explain why a medical education at Johns Hopkins was considered superior, even in its early years.
6. List several medical pioneers and discuss the importance of their contributions to the medical profession.
7. Explain the roles of the world health organizations.
8. Identify the role of the Centers for Disease Control (CDC) regulations in healthcare settings.
9. Discuss the various types of ambulatory care.
10. Distinguish among different types of doctors and medical practices.
11. Identify the medical specialties recognized by the American Board of Medical Specialties.
12. Compare and contrast the allied health professions and understand their relation to medical assisting.
VOCABULARY

accreditation (ak-krē-dā-shun) The process through which an organization is recognized for adherence to a group of standards that meet or exceed the expectations of the accrediting agency.

advent (a-dvēnt) Coming into being or use.

allopathic (a-lō-path’-ik) A term used to contrast homeopathic medicine with mainstream medicine; allopathic medicine supposedly is characterized by an effort to counteract the symptoms of a disease by administration of treatments that produce effects opposite to the symptoms.

alternative medicine A variety of therapeutic or preventative healthcare practices that are alternatives to mainstream medicine, such as chiropractic, homeopathy, naturopathy, and herbal medicine.

ambulatory (am-bō-lā-törē) Able to walk about and not be bedridden.

amenities Things that contribute to comfort, enjoyment, or convenience.

cardiac arrhythmias (kar’-de-ak a-rith’-mē-ahz) Irregular heartbeats caused by a malfunction of the electrical system of the heart.

case management The process of assessing and planning patient care, including referral and follow-up, to ensure continuity of care and quality management.

chiropractic (kī’-rō-prak’tik) A medical discipline that focuses on the nervous system and involves manual adjustment of the vertebral column to affect the nervous system, and thereby treat various disorders, as well as to promote patient wellness.

cited The process of acknowledging or referring to another source or work.

contamination (kon-tān-mā-shun) The process by which something is made impure, unclean, or unfit for use by the introduction of unwelcome or undesirable elements.

credentialing (kre-ˈdi-nəl’-iŋ) The act of extending professional or medical privileges to an individual; the process of verifying and evaluating that person’s credentials.

dissection (di-sek’-shun) The separation into pieces and exposure of parts for scientific examination.

encounter Any contact between a healthcare provider and a patient that results in treatment or evaluation of the patient’s condition; it is not limited to in-person contact.


holistic (hōl’-is-tik) Related to or concerned with all of the systems of the body rather than breaking it down into parts.

homeopathy (hō-mē-ō-pā-thē) A type of alternative medicine that attempts to stimulate the body to recover itself; a system of therapy based on the concept that disease can be treated with minute doses of drugs thought capable of producing the same symptoms in healthy people as the disease itself.

hospice (hos’-pus) A concept of care that involves health professionals and volunteers who provide medical, psychological, and spiritual support to terminally ill patients and their loved ones.

indicators An important point or group of statistic values that, when evaluated, indicate the quality of care provided in a healthcare facility.

indicted (in-dī’ted) Charged with a crime by the finding or presentment of a jury according to due process of law.

indigent (in-di-jent) Totally lacking in something of need.

innate Existing in, belonging to, or determined by factors present in an individual since birth.

innocuous (i-nō-ku-wus) Having no effect, adverse or otherwise; harmless.

mysticism The experience of seeming to have direct communication with God or ultimate reality.

naturopathy (na-chū-rah’-pā-the) An alternative to conventional medicine in which holistic methods are used, as well as herbs and natural supplements, with the belief that the body will heal itself. Naturopathic physicians currently can be licensed in 15 states, Puerto Rico, and the Virgin Islands.

osteopathic (os-te-ō-path’-ik) A term describing the type of medicine that is based on the theory that disturbances in the musculoskeletal system affect other bodily parts, causing many disorders that can be corrected by various manipulative techniques in conjunction with conventional medical, surgical, pharmacologic, and other therapeutic procedures.

pandemic (pān-dē-mik) A condition in which most people in a country, a number of countries, or a geographic area are affected.

peer review organizations (PROs) Groups of medical reviewers contracted by the Centers for Medicare and Medicaid Services (CMS) to ensure quality control and the medical necessity of services provided by a facility.

philanthropist (fi-lan’-thrō-pist) An individual who makes an active effort to promote human welfare.

putrefaction (pyū-trē-fak’-shun) Decomposition of animal matter that results in a foul smell.

robotics Technology dealing with the design, construction, and operation of robots in automation.

staff privileges Allowing a healthcare professional to practice within a specific facility.

standards Items or indicators used as a measure of quality or compliance with a statutory or accrediting body’s policies and regulations.

subluxations (sub-lék-sa’-shunz) Slight misalignments of the vertebrae or a partial dislocation.

telemedicine The use of telecommunications in the practice of medicine, in which great distances can exist between healthcare professionals, colleagues, patients, and students.

teleradiology The use of telecommunications devices to enhance and improve the results of radiologic procedures.

treatises (trē-ˈtə-sēz) Systematic expositions or arguments in writing, including a methodic discussion of the facts and principles involved and the conclusions reached.

triage (tri’-zhā) Identification of the severity of patients’ conditions and the allocation of treatment according to a system of priorities, which is designed to maximize the number of survivors and provide treatment for the sickest patients first.
The growth of today’s healthcare industry seems unstoppable. Thanks to modern technological advances, medicine speeds forward faster than ever in its quest to improve the health of humankind. Modern advances, such as telemedicine, are experiencing significant growth, and the images produced with telediagnosis have vastly improved in their resolution. Robotics is assisting healthcare professionals in surgery and even delivers drugs to hospital floors using laser sensors. Education in medicine has grown exponentially; computers, the Internet, and video have enabled an instructor in New York to communicate with a student in Los Angeles. The key to this technology lies in the development and widespread use of elaborate information systems that have revolutionized the way medicine is practiced today. Technology is advancing at an astounding rate; the healthcare environment of the future is barely imaginable. This chapter looks back at the history of medicine, gazing at its present, and glances toward its future.

THE HISTORY OF MEDICINE

Medical Language and Mythology

Today’s medical professional uses words with origins stemming from the romance and fantasy of classical and ancient languages. The study of anatomy reaches back to the dawn of recorded history. Today’s modern terms often are similar to their original versions. Some terms are inaccurate when translated literally, because the ancient did not fully understand body functions. The word *artery*, for example, which comes from the Greek word *arteria*, literally means “a windpipe.” The early Greeks believed that the arteries carried air, not blood. Greek and Roman mythology have contributed a major portion of our medical terminology, but we also borrowed liberally from Arabic, Anglo-Saxon, and Germanic sources. Several terms originate from the Bible.

The human head rests on the first cervical vertebra, which is called the *atlas*. Atlas was the famous Greek Titan who was condemned by Zeus to bear the heavens on his shoulders. Achilles’ mother hid him by the heel as she dipped him into the river Styx so that he would become invulnerable. However, his heel was not immersed, and he later died from a wound in that area. *Achilles heel* is a common expression used today to indicate a point of weakness. Aphrodite, the Greek goddess of love and beauty, is the source of the name for drugs used to enhance sexual arousal, called *aphrodisiacs*. The equivalent Roman goddess of love, Venus, is associated with lustful desires. A portion of the female anatomy, the *mons veneris* (mons pubis), and *venereal* diseases were named after her.

Aesculapius, the son of Apollo, was revered as the god of medicine. The early Greeks worshiped the healing powers of Aesculapius and built temples in his honor where patients were treated by trained priests. His daughters were Hygeia, goddess of health, and Panacea, goddess of all healing and restoration of health. Our modern word *hygiene* has its origin in Hygeia, and the modern meaning for *Panacea* is “a remedy for all ills and difficulties.” The staff of Aesculapius is a common medical icon. It depicts a serpent encircling a staff and signifies the art of healing. The staff of Aesculapius has been adopted by the American Medical Association as the symbol of medicine. The mythological staff belonging to Hermes, the messenger of the gods, is the caduceus, which was thought to have magical powers. The caduceus is a staff encircled by two serpents with wings at the top. This icon is the medical insignia of the U.S. Army Medical Corps and often is misused as a symbol of the medical profession (Figure 2-1).

Medicine in Ancient Times

Although religious and mythological beliefs were the basis for care for the sick in ancient times, evidence suggests that drugs, surgery, and other treatments based on theories about the body were used as early as 5000 BC. In the well-developed societies of the Egyptians, Babylonians, and Assyrians, certain men acted as physicians and used the little knowledge they had to try to treat illness and injury.

Moses presented rules of health to the Hebrews in approximately 1205 BC. He was the first advocate of preventive medicine and is considered the first public health officer. Moses knew that some animal diseases could be passed to humans and that contamination existed; therefore a religious law was developed forbidding humans to eat or drink from dirty dishes. The people of that era believed that all was in the hands of the gods and they would lose their souls.

Hippocrates, known as the Father of Medicine, is the most famous of the ancient Greek physicians (Figure 2-2). He was born in 450 BC on the island of Cos in Greece. He is best remembered for the Hippocratic Oath, which has been administered to physicians for more than 2,000 years. Hippocrates is credited with taking mysticism out of medicine and giving it a scientific basis. During this period of history, most believed that illness was caused by demonic possession; for the illness to be cured, the demon had to be removed from the body. Hippocrates’ clinical descriptions of diseases and his volumes on epidemics, fevers, epilepsy, fractures, and instruments were studied for centuries. He believed that the body had the capacity to heal itself and that the physician’s role was to help nature. Very little was known about anatomy, physiology, and pathology, and there was no knowledge of chemistry. Despite these limitations, many of the classifications of diseases and descriptions of symptoms that Hippocrates developed are still in use today.

Galen was a Greek physician who migrated to Rome in AD 162 and became known as the Prince of Physicians. He is said to have written more than 500 treatises on medicine. He wrote
an excellent summary on anatomy as it was known at the time, but his work was faulty and inaccurate because it was largely based on the dissection of apes and swine. He is considered the Father of Experimental Physiology and the first experimental neurologist. He was the first to describe the cranial nerves and the sympathetic nervous system, and he performed the first experimental section of the spinal cord, producing hemiplegia. Galen also produced aponia by cutting the recurrent laryngeal nerve, and he gave the first valid explanation of the mechanism of respiration. Galen was a champion of medical ethics; he thought that physicians “must learn to despise money,” and that if a physician was interested in profit, he was not serious in his devotion to the art of medicine. Galen’s beliefs about monetary profit from medicine parallel the views of many modern healthcare professionals, who understand the nature of the healthcare crisis the world faces today. Although much of what he believed about the body was incorrect, Galen’s teachings remained intact until human dissections began and physicians were able to visualize exactly what was inside the human body.

Because both Hippocrates and Galen were highly respected, the authority of their observations went unquestioned. This had a negative effect on the progress of science throughout the Dark Ages and well into the sixteenth century. Their theories and descriptions were considered immutable principles; therefore few physicians were innovative and curious enough to challenge them. Those who did experiment in medicine were scorned by their colleagues, and physicians continued to use methods that were at best ineffectual or innocuous and at worst harmful to the patient. However, the establishment of universities led to a study of theories of disease rather than observation of the sick.

### Early Development of Medical Education

Medical knowledge developed slowly, and distribution of such knowledge was poor. Before the printing press was invented in

the middle of the fifteenth century, very little exchange of scientific knowledge and ideas occurred; scientists were not well informed about the investigations of other scientists. The printing press allowed books to be distributed faster and over a widespread area.

Another development important to science occurred in the seventeenth century, when European academies or societies were established, consisting of small groups of men who met to discuss subjects of mutual interest. The academies provided freedom of expression that, with the stimulus of exchanging ideas, contributed significantly to the development of scientific thought. One of the earliest of the academies was the Royal Society of London, formed in 1662. The development of communication during this era was important, and these societies contributed to the exchange of information.

In the United States, medical education was greatly influenced by the Johns Hopkins University Medical School in Baltimore, Maryland, established in the early 1890s. The school admitted only college graduates with a year’s training in the natural sciences. The clinical education at Johns Hopkins was superior, because the school partnered with Johns Hopkins Hospital, which had been created expressly for teaching and research by members of the medical faculty.

The earliest medical school accreditation resulted from a report published by Abraham Flexner. He received a grant from the Carnegie Foundation Commission to study the quality of medical colleges in the United States and Canada. His report, called the Flexner Report, resulted in the closure of many low-ranking schools and the upgrading of others. These events legitimized medical education and opened new doors for many individuals to the world of medicine.

### Critical Thinking Application

2-1

- Mr. Santos asks his class to identify which of the individuals involved in early medicine have had the greatest impact on modern healthcare. Whom would you choose and why?
- The students point out that early research often was viewed in a negative manner. How does research affect us now, and how is it viewed by the public?

### Early Medical Pioneers

Andreas Vesalius (1514-1564) was a Belgian anatomist known as the Father of Modern Anatomy (Figure 2-3). At the age of 29, he published his great De Corporis Humani Fabrica, in which he described the structure of the human body. This work marked a turning point by breaking with the traditional belief in Galen’s theories. Vesalius introduced many new anatomic terms, but because of his radical approach, he was subjected to persecution from his colleagues, teachers, and pupils. Despite his great contributions to the science of anatomy, his name is not used to identify any significant anatomic structures.

Other important advances and discoveries took place throughout the world. Gabriele Fallopius (1523-1562), an Italian student of Vesalius, also was an accurate dissector. He described and named many parts of the human anatomy. He named the fal-
His surgical procedures were soundly based on pathologic evidence. He was the first to classify teeth in a scientific manner, and he introduced artificial feeding by means of a flexible tube passed into the stomach. He provided a classic description of the syphilitic chancre, which sometimes is called a *hunterian ulcer*. During his studies of venereal diseases, he inoculated himself with what he thought was gonorrhea, but instead he acquired syphilis. His results in this study actually caused confusion in the medical community, because he mistakenly thought that gonorrhea was a symptom of syphilis. This misconception was not corrected until the beginning of the twentieth century. His collection of anatomic and animal specimens formed the basis for the museum of the Royal College of Surgeons. After Hunter’s death, he was buried in St. Martin. However, his remains were later moved to Westminster Abbey as a gesture of honor. A tablet was placed over his grave by the Royal College of Surgeons to “record their admiration of his genius as a gifted interpreter of the Divine Power and Wisdom at work in the laws of Organic Life and their grateful veneration for his services to mankind as the Founder of Scientific Surgery.” Today, the John Hunter Hospital in Australia serves more than 600 inpatients and 1,000 outpatients a day.

Edward Jenner (1749-1823) was a student of John Hunter and a country physician from Dorsetshire, England. He is considered one of the immortals of preventive medicine for his development of the smallpox vaccine. While Jenner was serving as an apprentice, he assisted in treating a dairymaid. Smallpox was mentioned, and she commented, “I cannot take that disease, for I have had cowpox.” Smallpox at that time was a deadly pandemic. Jenner observed that those who had contracted cowpox never contracted smallpox. Later, as a practicing physician, Jenner continued investigating the relationship between cowpox and smallpox almost obsessively, but the medical society members grew bored with his obsession and threatened to expel him from their ranks. On May 14, 1796, Dr. Jenner took purulent matter from a pustule on the hand of Sarah Nelmes, a dairymaid, and inserted it through two small superficial incisions into the arm of James Phipps, a healthy 8-year-old boy. This was the first vaccination. On July 1, a virulent dose of smallpox matter was given to the boy in the same arm. Phipps’ vaccination kept him safe from the dreaded disease, and Jenner’s method of vaccination spread throughout the world. The results of his experiments were published in 1798. He called this method of protection *vaccination*, from the Latin word *vaccina*, which means “cow,” and at that time, cowpox was called *vaccinia*. Today smallpox has been eradicated throughout the world as a result of a planned program of global vaccination.

Austrian physician Leopold Auenbrugger (1722-1809) developed the use of percussion in diagnosis. In 1751 he became physician in chief to the Hospital of the Holy Trinity at Vienna, where he tested his discovery. Although scorned and ignored by his contemporaries, his techniques later made him famous and are still used today during physical examinations. René Laennec (1781-1826) was a French physician who developed the stethoscope in 1819. At first he used only a cylinder of rolled paper in his hands; later he used a wooden device because of its sound-conducting properties. With today’s sophisticated stethoscopes,

**Medical Advances in the Eighteenth and Nineteenth Centuries**

English scientist John Hunter (1728-1793) is known as the Founder of Scientific Surgery. An army surgeon, he became an expert on gunshot wounds and experimented with tissue transfer. 
physicians are able to hear sounds in the body, including a fetus inside the mother. Laënnec’s book, *Treatise on Mediate Auscultation and Diseases of the Chest*, was readily accepted and translated into many languages. It is said to be the most important treatise on diseases of the thoracic organs ever written.

Several men of the early 1800s are remembered for their fight against puerperal fever and their concern for women’s health. Puerperal fever, an infectious disease that can be contracted during childbirth, was also called *puerperal sepsis* or *childbed fever*. The term *puerperal*, denoting a woman in childbed, originates from the Latin *puer*, “a child,” and *paro*, “to bring forth.” The word *puerperium* now designates the period from delivery to the time the uterus returns to normal size (approximately 42 days after childbirth).

The best known of these men was the Hungarian physician Ignaz Philipp Semmelweis (1818-1865); history has called him the Savior of Mothers. His fight against puerperal fever is a sad story of hardships. His theories were resisted by many professionals, including his instructors. Semmelweis noted that the fever often attacked women who were delivered by medical students coming straight from the autopsy or dissecting rooms. Semmelweis directed that in his wards the students were to wash and disinfect their hands before going to examine the women and deliver the children. This process brought about a marked reduction of cases of puerperal fever on his ward, but he still faced unrelenting opposition. As his theories were proved correct, Semmelweis felt an incredible guilt that doctors themselves had caused so many deaths. He died at the age of 47, ironically, from the very disease he had fought. He was infected with puerperal fever from a cut on his finger during an autopsy. His grave had hardly been closed when scientists began to understand the causes of this disease, largely as a result of the investigations of two great scientists, Louis Pasteur and Joseph Lister.

**Pasteur** (1822-1895) was a Frenchman who did brilliant work as a chemist, but it was his studies in bacteriology that made him one of the most famous men in medical history (Figure 2-4). The title of Father of Bacteriology was bestowed on him, and he also has been honored as the Father of Preventive Medicine. He gave unselfishly of his time outside his profession to help others solve problems. Pasteur’s adventures included studying the difficulties involved in the fermentation of wine. He averted disaster in France’s critical winemaking industry by a process he developed, now called *pasteurization*. This achievement alone would have made him an immortal among the French. Through a process of supplying enough heat to destroy microorganisms, wine was prevented from turning to vinegar. The French people called on Pasteur again to help the ailing silkworm industry. He devoted years to the conquest of diseases that infected the silkworm. His efforts were impeded when he was stricken with hemiplegia, but after a long, difficult recovery, he was able to continue with a stiff hand and a limp.

Convinced that the infinite world of bacteria held the key to the secrets of contagious diseases, Pasteur left chemistry again to continue studying his theory. Many renowned scientists denied the germ theory of disease and devoted themselves to degrading Pasteur’s theories and experiments. In the midst of this controversy, he became involved in the prevention of anthrax, which threatened the health of cattle and sheep. Pasteur eventually was honored for his work with many other diseases, such as rabies, chicken cholera, and swine erysipelas. He devoted the last 7 years of his life to the Pasteur Institute, which was founded as a clinic for rabies treatment, a research center for infectious disease, and a teaching center. The Pasteur Institute still exists today. He died in 1895, with his family at his bedside. It is said that his last words were, “There is still a great deal to do.”

**Joseph Lister** (1827-1912) revolutionized surgery through the application of Pasteur’s discoveries. He understood the similarity between infections in postsurgical wounds and the processes of *putrefaction*. Pasteur proved that these processes were caused by microorganisms. Before this time, surgeons accepted that infections in surgical wounds were inevitable. Lister reasoned that microorganisms must be the cause of infection and should be kept out of wounds. His colleagues were indifferent to his theories, because most believed infections were God-given and natural. Lister disagreed, and he developed antiseptic methods by using carbolic acid for sterilization. By spraying the rooms with a fine mist of the acid, soaking instruments in carbolic solutions, and washing his hands in a similar solution, he was able to prove his theories. He is honored as the Father of Sterile Surgery. Pasteur and Lister met after years of great mutual admiration. The meeting was filled with emotion, and it was written in *Pathfinders in Medicine* that “a new star should have appeared in the heavens to commemorate the event.” Medicine truly owes a deep gratitude to these two pioneers for the knowledge they imparted to the art.

**Robert Koch** (1843-1910) is a familiar name to all bacteriologists because of his famous Koch’s Postulates; that is, his theory of rules that must be followed before an organism can be accepted as the causative agent in a given disease. Koch was a German physician who earned great honors in bacteriology and public
health. He introduced many of the tools used in the laboratory, such as the culture plate method of isolating bacteria. He discovered the cause of cholera and demonstrated its transmission by food and water. This discovery completely transformed health departments and proved the importance of bacteriology in everyday life. Koch's greatest disappointment was his failure to find a cure for tuberculosis, but in his attempt, he isolated tuberculin, the substance produced by tubercle bacteria. Its use as a diagnostic aid was of immense value to medicine. In 1885 the University of Berlin created the Chair of Hygiene and Bacteriology in honor of Robert Koch. He became a Nobel Laureate in 1905.

One of Koch's students was a German physician named Paul Ehrlich (1854-1915). He pioneered the fields of bacteriology, immunology, and especially chemotherapy. Chemotherapy is the process of treating diseases by injecting chemicals into the body to destroy microorganisms, and this was a new science in Koch's day. Ehrlich was only 28 when he wrote his first paper on typhoid, but his greatest gift to humanity was called his "magic bullet," or formula 606, which was designed to fight syphilis. With the organism identified by scientists Bordet and Wasserman, Ehrlich set out to find a chemical that would destroy the organism but not harm the host, specifically, the human body. The six hundred sixth drug Ehrlich tried finally brought about healing. He called it salvarsan, because he believed that it offered humankind salvation from the disease. This endeavor also marked the beginning of the practice of injecting chemicals into the body to destroy a specific organism. In 1908 Ehrlich shared the Nobel Prize with Eli Metchnikoff, who is remembered for his theory of phagocytosis and immunology.

Crawford Williamson Long (1815-1878) was the first to use ether as an anesthetic agent. Early in 1842, a group of students would have a social gathering after chemistry lectures and inhale ether, a chemical commonly found in chemistry laboratories, as a form of amusement. Ether, an intoxicant similar to nitrous oxide, functions as a soporific, or sleep-inducing agent. However, at one of these "ether frolics," as they were called, Dr. Long also observed that people under the influence of ether did not seem to feel pain. After considerable thought, he decided to use ether for a surgical operation. In March, 1842, he removed a tumor from the neck of James M. Venable after placing him under the influence of ether. Dr. Horace Wells was a dentist who reported using nitrous oxide as an anesthetic in 1844. Another dentist, Dr. William T. G. Morton, reported using ether in 1846 when he extracted a tooth from a patient, and he also used the gas at Massachusetts General Hospital for a surgical procedure.

Surgeons are grateful to Wilhelm Konrad Roentgen (1845-1923), a professor of physics at the University of Würzburg, Germany. Roentgen discovered the x-ray in 1895 while experimenting with electrical currents passed through sealed glass tubes. He was awarded the Nobel Prize in Physics in 1901. Although he called it an x-ray, history has honored him by calling it the roentgen ray. Marie and Pierre Curie discovered radium in 1898, and they were awarded the 1902 Nobel Prize in Physics for their work on radioactivity. Unfortunately, Pierre was killed 3 years later while crossing a street in a rainstorm. Marie was awarded his teaching position at the Sorbonne, a medical university in France; no woman had taught at the school in its 650-year history. In 1911 she was awarded the Nobel Prize for her discoveries of radium and polonium, the first person to receive the award twice. She died in 1934 from pernicious anemia, which was believed to have been caused by her overexposure to radiation and years of overwork.

**Nineteenth Century Women in Medicine**

Many other women made great contributions to medicine in the early nineteenth century. Florence Nightingale (1820-1910) is known as the founder of nursing and is fondly called the Lady with the Lamp (Figure 2-5). She was of noble birth, and somewhat late in life she sought nursing training in both England and Europe. By the dawn of the Crimean War in 1854, she had established a fine reputation for her work in hospital organization. She was invited by the British Secretary of War to visit the Crimea to help correct the terrible conditions that existed in caring for the wounded. She created the Women's Nursing Service in Scutari and Balaklava. The physicians treated her and the other 38 nurses poorly until a crisis brought thousands of wounded and sick soldiers to the army hospitals. The bravery and competence of the nurses helped the doctors realize their value to the medical profession. In 1860 she founded the Nightingale School and Home for Nurses in London, which marked the beginning of professional nursing education.

Clara Barton (1821-1912), an American, began her nursing career early in life. When she was 11 years of age, her brother fell from the roof of their barn, and Clara nursed him back to health over a 2-year period. She later was a battlefield nurse and philanthropist, whose work during the Civil War led her to recognize that very poor records were kept in Washington to aid in the search for missing men who were wounded or killed in combat. Her efforts to remedy this led to the formation of the Bureau of Records. Her organization and recruitment of supplies for the wounded led to her eventual involvement with the Red Cross in the Franco-Prussian War. In 1881 she organized a Red Cross Committee in Washington, the original formation of the American Red Cross. She served as its first president, from 1881 to 1904. She retired at the age of 82, just after personally leading dangerous expeditions to help victims of fires, hurricanes, and

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**Figure 2-5** Considered the founder of nursing, Florence Nightingale is also known as the Lady with the Lamp. (Courtesy National Library of Medicine, Bethesda, Md.)
in the county jail. She continued her work, and after World War II, she successfully advocated research into hormonal contraception because of the newfound concern about population growth. This research ultimately led to development of the birth control pill. When the Planned Parenthood Federation of America was formed in 1941, she was named honorary chairperson.

**CRITICAL THINKING APPLICATION 2-2**

Mr. Santos asks his students to tell him which of these early pioneers they would most like to have worked with. Whom would you choose and why?

- What difficulties would these early medical workers have faced as they explored medicine?
- What difficulties do researchers face today?

**MEDICAL MILESTONES**

In recognition of the achievements of scientists of the past, Sir Isaac Newton spoke of our ability to discover and innovate in the medical field. He humbly said, "If I have seen a little further than others, it is because I have stood on the shoulders of giants." Great strides in medicine occurred in the twentieth century, and technology began to advance rapidly. Medical leaders continued their contributions, and knowledge, treatment, and research grew by leaps and bounds.

Walter Reed, a U.S. Army pathologist and bacteriologist, proved that yellow fever was transmitted by the bite of a mosquito. Individuals with diabetes should be grateful to Sir Frederick Grant Banting, a Canadian physician who isolated insulin for treatment, along with Charles Herbert Best, a Canadian physiologist. In 1928 Sir Alexander Fleming discovered penicillin accidentally while researching influenza and working with staphylococcal bacteria. He found a substance in mold that prevented the growth of bacteria even when the substance was diluted 800 times.

Cardiologist Helen Taussig and surgeon Alfred Blalock explored the health issues of children born with cyanosis resulting from a malformed heart. Dr. Taussig collaborated with Dr. Blalock to develop a lifesaving operation for these children, called "blue babies." History often omits the contributions of Vivien Thomas, an African-American who was Dr. Blalock's surgical research technician at Johns Hopkins Hospital. Thomas was a former carpenter who constructed several of the medical instruments used in the Blalock-Taussig procedure. Thomas actually created the blue baby condition in dogs, on which he regularly practiced the surgical procedure. When Dr. Blalock and Dr. Taussig performed the first blue baby operation at Johns Hopkins University, Thomas stood over Blalock's shoulder and advised him during the procedure, because Thomas had done the surgery several more times than Blalock. This happened at a time when African-Americans were not allowed on the main floors of the hospital, much less in the surgical suite. This surgery became known as the Blalock-Taussig procedure, and although the first blue baby operation prolonged the patient's life by only 2 months, subsequent operations were successful, and children were able to leave the hospital with the hope of a healthy life.
Jonas Edward Salk and Albert Sabin almost eradicated polio-
myelitis, once the killer and crippling of thousands in the United
States. Salk's injectable vaccine was developed in 1952, and after
wide-scale testing in 1954, it was distributed nationally, greatly
reducing the incidence of the disease. Sabin's live-virus vaccine,
in a form that could be swallowed, became available less than a
decade later.

Werner Forssmann, a German surgeon, originated a cardiac
technique called catheterization that is used in the diagnosis and
treatment of heart disease. Christian Barnard, a South African
surgeon, performed the first human heart transplantation in
1967. Dr. Elisabeth Kübler-Ross, a Swiss-born psychiatrist who
died in 2004, was shocked at the treatment of terminally ill
patients at her hospital in New York. She wrote the best-selling
book On Death and Dying, which helped professionals and lay-
persons alike understand the stages of grief.

**CRITICAL THINKING APPLICATION 2-3**

- During class discussion, Mr. Santos points out that the leaders in the
  healthcare industry had specific goals for their careers and achieved
  worldwide recognition for their contributions. What individuals have
  made contributions to medicine in recent years?
- How can the individual medical assistant make a contribution to
  medicine?

**MODERN MEDICINE**

Many modern physicians are making important discoveries in
and contributions to the field of medicine. Dr. David Ho is
considered by many to be one of the most brilliant minds today,
helping to piece together the puzzle of the human immuno-
deficiency virus (HIV). Ho is the scientific director and chief execu-
tive officer (CEO) of the Aaron Diamond AIDS Research Center
in New York City and is also a professor at Rockefeller University.
He was born in Taiwan in 1952, and his family immigrated to the
United States when he was 12 years old. He eventually entered
college to study physics—medicine was actually his second choice—but once he discovered molecular biology and the
concept of gene splicing, he decided to become a researcher.
He still does calculations in Chinese. Ho was named Time maga-
azine's "Man of the Year" in 1996 for his work in the battle against
HIV and acquired immunodeficiency syndrome (AIDS).

Dr. Eve Slater served as the Assistant Secretary for Health at
the U. S. Department of Health and Human Services (DHHS).
Dr. Slater was the primary advisor to former Health Secretary
Tommy G. Thompson on matters regarding the nation's public
health, and she oversaw the U.S. Public Health Service (PHS).
Before she joined the DHHS, Dr. Slater served as a senior vice
president of Merck Research Laboratories' external policy, and
she also was vice president of corporate public affairs. Dr. Slater
was the first woman to hold this rank. During her time with
Merck, she spearheaded the approval of major medicines used to
treat HIV infection, osteoporosis, cardiovascular disease, arthri-
tis, chickenpox, and many others. In 1976 Dr. Slater became the
first woman appointed chief resident in medicine at Massachu-
setts General Hospital. She served as an assistant professor at
Harvard Medical School and directed laboratory research funded
by the National Institutes of Health (NIH) and the American
Heart Association. Currently, Dr. Slater has been a board member
of several prestigious medical organizations, including Thera-
stance, Inc. and VaxGen, the company co-founded by Dr. Don
Francis, who led the fight against AIDS when the disease was
first discovered. Dr. Slater currently serves as the senior vice
president for worldwide policy at Pfizer Pharmaceuticals.

Dr. C. Everett Koop graduated from Cornell University as
a medical doctor in 1941 and spent most of his career as a
pediatric surgeon. During his tenure as the U. S. Surgeon General,
he became a proponent of tobacco awareness, insisting that
tobacco advertisements must be less attractive to the youth of
today. Dr. Koop is a professor at Dartmouth Medical School. He
founded the Koop Institute, an organization that has a mission to
"promote the health and well-being of all people." Dr. Koop
has been honored with many awards, including 41 honorary
doctorates.

Dr. Marcia Angell is the former editor in chief of the New
England Journal of Medicine (NEJM), one of the most prestigious
medical publications in the United States. Her career with NEJM
began in 1979, and her excellent articles spanned a variety of
subjects, from the pharmaceutical companies' profit margins to
the effects of socioeconomic status on Americans seeking health-
care services. Angell was named one of the 25 most influential
Americans in 1997 by Time magazine. She has written and con-
tributed to several books, including Science on Trial: The Clash of
Medical Evidence and the Law in the Breast Implant Case. Angell
is a board-certified pathologist and currently serves as senior
lecturer in the Division of Medical Ethics at Harvard Medical
School.

As the director of the National Institute of Allergy and Infection
Diseases at the NIH, Dr. Anthony Fauci leads research efforts on immune-mediated disorders. His scientific leadership
has resulted in major advances in several diseases, such as poly-
arteritis nodosa and Wegener's granulomatosis. Many of his
studies now relate to HIV and the body's response to AIDS, as
well as ways to improve HIV treatment and prevention, includ-
ing the development of an HIV vaccine. Of the more than 1
million scientists who published between 1981 and 1994, Dr.
Fauci was the fifth most cited. He was the thirteenth most cited
scientist between 1983 and 2002. He received his MD from
Cornell University Medical College, and his career with the NIH
has spanned more than 40 years. Dr. Fauci was honored with the
Presidential Medal of Freedom at the White House in June of
2008.

Dr. Antonia Novello was the first woman and the first His-
panic to be honored with the post of Surgeon General. She served
at the NIH and was the honorary chairperson of the National
Youth Summit for Mothers Against Drunk Driving (MADD).
Novello played a key role in writing the warning labels on cig-
arette packages. She supported and promoted the National Organ
Transplant Act of 1984 and has contributed to the efforts of the
United Nations Children's Fund (UNICEF). Novello was a clinical
professor at Georgetown University Hospital and in 1994 was
inducted into the National Women's Hall of Fame. She served as
THE NATIONAL VIEW OF HEALTHCARE

World Health Organization

The World Health Organization (WHO), founded in 1948, is a specialized agency of the United Nations. The organization promotes cooperation among nations in their efforts to control and eliminate diseases worldwide. The purposes of WHO are:

- To provide worldwide guidance in the field of health
- To set global standards for health
- To cooperate with governments in strengthening national health programs
- To develop and transfer appropriate health technology, information, and standards

One of the greatest accomplishments of this agency was the eradication of smallpox. Other diseases, such as polio and leprosy, are on the verge of eradication. The agency also created and maintains the International Classification of Diseases (ICD) coding system. ICD-9 is used today to identify diseases and conditions using a specific code number. The original purpose of this system was to track worldwide morbidity and mortality statistics. WHO is committed to research and delivery of needed drugs and medical supplies to various areas of the world. In addition, WHO promotes the sharing of health information, and WHO officials meet with the leaders of the worldwide health industry to discuss various ethical and moral implications that face today's healthcare professionals.

U.S. Department of Health and Human Services

The Department of Health and Human Services is the principal U.S. agency for providing essential human services and protecting the health of all Americans, especially those unable to help themselves. The DHHS is made up of more than 300 programs involved in:

- Medical and social science research
- Immunization services
- Financial assistance for low-income families
- Child support enforcement services
- Improvement of infant and maternal health
- Child and elder abuse prevention services
- Assistance programs for elderly Americans

The DHHS also oversees the Medicare and Medicaid programs. Medicare is the nation’s largest health insurer, and the DHHS processes more than 1 billion claims every year.

U.S. Army Medical Research Institute of Infectious Diseases

The primary focus of the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) is to protect members of the military, but the institute conducts key research programs in national defense and infectious diseases that benefit everyone (Figure 2-7). USAMRIID, located at Fort Detrick in Maryland, works extensively with the Centers for Disease Control and Prevention (CDC) and WHO. USAMRIID also controls an internationally known reference laboratory with state-of-the-art facilities. This laboratory is instrumental in identifying biologic threats and the diseases those threats produce. USAMRIID is the only laboratory facility operated by the Department of Defense that is equipped to study biosafety level IV viruses and pathogens.

Four biosafety levels are commonly accepted among laboratory professionals. Biosafety level I includes well-known agents that pose a minimal or low biohazard potential to laboratory personnel and to the environment as a whole. At this level, the laboratory is not necessarily separated from the regular areas of the facility. Examples of level I pathogens include Pneumococcus and Salmonella organisms. In the biosafety level II section of the laboratory, substances with a moderate biohazard potential are studied. For levels I and II areas, laboratory personnel receive specific training in handling pathogens, and specialized equipment is used to prevent splashes and splatters. Pathogens classified as biosafety level II include the hepatitis, Lyme disease, and influenza viruses.

Personnel working in the biosafety level III section receive very specific training in working with the potentially deadly pathogens found at this level. All procedures performed on level III pathogens have a high biohazard risk and are done inside protective safety cabinets. Laboratory personnel are required to wear heavy personal protective equipment. Special regulations concerning exhaust air and ventilation are strictly followed, and access to the laboratory is limited when work is in progress. HIV, Bacillus anthracis, which causes anthrax; and Rickettsia typhi and R. prowazekii, which cause typhus, are some of the pathogens classified as biosafety level III.

Biosafety level IV includes the most deadly pathogens, which often produce incurable diseases. The biohazard risk of transmission of these agents is extreme and includes the risk of airborne transmission. Laboratory personnel are highly trained in the manipulation and handling of these dangerous pathogens. Laboratory access is strictly controlled in this section. Some of the pathogens studied at biosafety level IV include the Ebola virus, Lassa virus, and hantavirus.

Centers for Disease Control and Prevention

The headquarters of the CDC is in Atlanta, Georgia (Figure 2-8). The CDC is the principal U.S. federal agency concerned with the health and safety of people throughout the world and is a
part of the DHHS. It is a clearinghouse for information and statistics associated with healthcare. Several divisions within the CDC focus on specific health-related issues, such as the National Center for HIV, STD, and TB Prevention; the Public Health Practice Program Office; the National Center on Birth Defects and Developmental Disabilities; and the National Center for Health Statistics. Branch offices are located throughout the United States and in several foreign countries. The CDC provides regulations that affect all healthcare facilities. When the virus now known as HIV was discovered, the CDC was one of the first organizations to research and attempt to isolate the virus. When a pandemic begins, the CDC information services offer guidelines that help facilities ensure the health of their employees, patients, and the public at large. The agency also conducts research into the origin and occurrence of diseases and develops methods to control and prevent them. In addition, it develops immunization services and aids in the training of healthcare workers.

National Institutes of Health

The National Institutes of Health began as a one-room laboratory in the Marine hospital on New York's Staten Island in 1887. Its first major contribution to medicine was the isolation of the bacterium that causes cholera. In 1930 the laboratory became the NIH, an agency of the DHHS. The mission of the NIH is to uncover new knowledge that will lead to better health for everyone. As a part of the public health service, it seeks to improve the health of the American people, supports and conducts biomedical research into the causes and prevention of diseases, and uses a modern communications system to furnish biomedical information to the healthcare professions.

The NIH moved from Washington, DC, to Bethesda, Maryland, in 1938 and today occupies more than 60 buildings covering 30 acres. It consists of 27 different institutes and centers, as well as the National Library of Medicine. Thousands of research projects are underway in NIH laboratories and clinics at any given time. The NIH also provides support to other research projects conducted at universities, medical schools, and hospitals.

TYPES OF HEALTHCARE FACILITIES

Hospitals

Hospitals are classified according to the type of care and services they provide to patients, as well as by the type of ownership. Acute care hospitals offer intensive care units and emergency or trauma departments and are equipped to handle the most severely ill or injured patients. Subacute care hospitals offer patient care for those who do not require extensive services but still need hospital supervision and treatment. Specialty hospitals, such as a psychiatric hospital, offer specific services. Teaching hospitals provide a learning environment and often have research departments as well. These hospitals usually are affiliated with medical schools, and interns or residents provide care supervised by licensed physician instructors. Community hospitals provide care in rural areas or in specific areas within a metropolis. Regional hospitals usually are acute care facilities and serve a large area in which intensive care may not be offered in local communities.

Private hospitals are run by a corporation or other organization and usually are designed to produce a profit for the owners or stockholders. Nonprofit hospitals exist to serve the community in which they are located and are normally run by a board of directors. The term nonprofit sometimes is misleading, because "profit" is different from "making money." A nonprofit hospital or organization may make money in a campaign or fund raiser, but all of the money is returned to the organization. Nonprofit hospitals and organizations must follow strict guidelines in the area of finance and must account to the government for the money brought in and the purposes for which it is used.

Sometimes the term county hospital is used to designate the hospital to which indigent patients are taken. These hospitals provide emergency care to those who cannot pay for medical expenses. Today, however, many people without insurance go to the emergency department (ED or ER) for routine illnesses. This is one reason EDs are busy and full. If patients have no other options, the ED physicians become primary care providers. This is a major cause of the long waiting times in hospital EDs. Managed care has eased this problem somewhat by refusing to cover visits to the ED that are not true emergencies. Triage, performed by physicians, nurses, and some other licensed medical professionals, determines which patients have the most severe conditions and should be seen first.

Hospitals have various departments that are organized to provide efficient patient care. The admissions department gathers information and enters it into a computer for use by the rest of the hospital staff. Nursing service supervises all of the nursing care given to the patients and is involved in case management. The laboratory provides diagnostic testing on blood, body fluids, and tissues, and the radiology or nuclear medicine department offers diagnostic imaging and radiographic services. The respiratory services department offers a broad spectrum of diagnostic tests and various treatments. Most hospitals also have a physical medicine and rehabilitation department, which offers both physical and occupational therapy. The dietary department employs professionals who carefully plan menus to meet the needs of each patient served. Most modern hospitals have a surgery
department, and many offer day surgery services that allow patients to undergo a procedure and return home the same day, if they recover as expected. The medical records department is responsible for the patient records related to every encounter that takes place in the facility. Social services works with patients to ensure continuity of care, patient education, and social intervention, all of which assist patients with emotional, economic, and social concerns.

Hospital administrators manage the hospital on a day-to-day basis, and human resource responsibilities usually are a part of the administration department. Almost every hospital has a board of directors to assist the administrators in governing the hospital, and usually a medical staff committee, led by the hospital’s chief of staff, assists in the management of the facility and the credentialing process for the physicians who have staff privileges. Credentialing involves determining whether a practitioner should be allowed to practice medicine in a facility, based on his or her education, license, past performance, and other qualifications.

The National Practitioner Data Bank (NPDB) also gathers information that helps healthcare facilities ensure that physicians who might be brought on staff are competent. The intent of the NPDB is to improve the quality of healthcare by encouraging state licensing boards, hospitals, healthcare entities, and professional societies to identify and discipline those who engage in unprofessional behavior and to restrict the ability of incompetent physicians to move from state to state without disclosure or discovery of previous medical malpractice payment or adverse action history. NPDB provides information about physicians who have had licensure problems, made malpractice settlements, had clinical privileges revoked or restricted, or had action taken against them by a professional society to registered entities, but not to the general public.

Peer review organizations (PROs) are also critical to good healthcare facility management. A medical peer review is defined by the American Medical Association as a process conducted by physicians to ensure that other physicians consistently maintain optimum standards of fitness to practice medicine. Peer review can be applied to other medical professionals as well. Credentialing is the verification process that takes place before assignment or reappointment of staff privileges; peer reviews help ensure that physicians or other medical professionals maintain the high standards necessary to practice medicine in an accurate and effective way.

Accreditation is considered the highest form of recognition for the quality of care a facility or organization provides. Not only does it indicate to the public that the facility is concerned with providing high-quality care, it also provides professional liability insurance benefits and plays a role in regulatory agency relicensure and certification efforts. Hospitals and other healthcare facilities are often accredited by the Joint Commission, an organization concerned with the quality of care in healthcare facilities.

Standards or indicators have been developed that help to determine when patients are receiving high-quality care. The term quality refers to much more than whether the patient liked the food served or had to wait to have a procedure or test performed. Categories of compliance include:

- Assessment and care of patients
- Use of medication
- Plant, technology, and safety management
- Orientation, education, and training of staff
- Medical staff qualifications
- Patient rights

Ratings from 1 to 5 are given to the facility on its performance in specific areas. A 1 rating means that the facility is in full compliance with that standard, and the other ratings indicate levels of noncompliance. The DHHS also regulates healthcare facilities, as does the federal Occupational Safety and Health Administration (OSHA), a division of the U.S. Department of Labor that enforces many laws related to workplace safety.

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**CRITICAL THINKING APPLICATION 2-4**

- Mr. Santos has assigned his students to groups and asked them to investigate local hospitals. What types of hospitals are found in your local area, and what services do they provide? How might a hospital board decide what services to offer to the community?
- How might Mr. Santos’ students find out whether a physician has staff privileges at a certain hospital?
- What areas or populations are underserved, and why might this be the case?

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**Ambulatory Care**

Many other types of healthcare facilities operate in the industry today. Ambulatory care centers include a wide range of facilities that offer healthcare services to patients who are able to walk around and are not bedridden. Physicians’ offices, group practices, and multispecialty group practices are common types of ambulatory care facilities. Group practices may involve a single specialty, such as pediatrics, or may be multispecialty. A multispecialty practice might consist of an internal medicine specialist, an oncologist, a family practitioner, and an endocrinologist. Usually the physicians in the practice refer patients to each other when indicated. This is not only more convenient for the patients, but also more profitable for the physicians.

Occupational health centers are concerned with helping patients return to work and productive activity. Often, physical therapy is used in conjunction with rehabilitation services that assist the patient in regaining as much of the previous level of ability as possible. Also, freestanding rehabilitation centers can assist patients with a wide range of services. Pain management centers help patients deal with discomfort associated with their condition. Sleep centers diagnose and treat people with sleep problems. As is pain, difficulty sleeping is a symptom, and the cause of the disturbance must be found so that proper treatment can be provided. Freestanding urgent or emergency care centers provide patients with an alternative to hospital EDs. They are less expensive, have a shorter waiting time, and are conveniently located in many areas. Most have flexible hours, many are open well into the evening hours, and walk-in appointments usually are accepted.
Surgery has become more convenient because of the number of ambulatory surgical centers that exist today. Day surgery performed in hospitals has continued to provide patients with alternatives to overnight hospital care after surgery. Many insurance companies now prefer day surgery, because it is more cost-effective. Not many years ago, the only alternative to inpatient surgery was the same hospital's day-surgery department. Today, more and more freestanding surgical centers are becoming available. Patients can be treated with laser surgery, radial keratotomy, and cataract removal during the day and recover at home the same evening. Plastic surgeons are becoming very innovative in the physical structure of their offices and the types of surgery they offer on an outpatient basis. Many plastic surgeons offer breast augmentation and reduction and even abdominoplasty ("tummy tuck") and liposuction in the office setting. Not long ago, an abdominoplasty meant staying in the hospital for several days. The new trend is becoming more accepted, partly as a result of the "office-based surgery" accreditation offered by the Ambulatory Care Accreditation Program of the Joint Commission.

A number of rehabilitation services are available to patients, based on their need and the type of illness or injury. Rehabilitation services may be obtained from acute care hospitals, rehabilitation hospitals, or various ambulatory rehabilitation facilities. Patients may use these services for a few weeks after an illness or injury or may continue them for several years. Rehabilitation usually involves several members of the healthcare team working together to ensure that the patient recovers to the greatest extent possible.

Dialysis centers offer services to patients with severe kidney disorders, and many of the larger cities across the country have cancer centers for patients who need treatment by oncologists. Many other types of ambulatory care facilities exist, including centers that provide magnetic resonance imaging (MRI), student health clinics, dental clinics, endoscopy centers, community health centers, mobile health services, pediatrics care centers, and women's health centers.

Geriatric and long-term patients have more options today for ambulatory care than ever before. In the past, nursing homes were the only alternative to keeping elderly patients in their own homes. These nursing homes provided care for residents who needed more than just assistance with day-to-day activities. Now, many attractive options to traditional nursing homes or skilled nursing facilities are available. One of the most popular is assisted living. Most assisted living facilities provide 24-hour supervision of their residents, most meals, and a broad range of services, from the very basic, such as transportation to physician office visits and errand running, to the extravagant, such as shopping trips and daylong outings. Most also provide exercise programs, social services, laundry and linen services, and housekeeping. The cost ranges from approximately $1,000 to $3,000 per month, depending on the location and the amenities desired by the resident.

Many new assisted living facilities are designed specifically for patients with Alzheimer's disease or other impaired memory conditions. Independent retirement communities offer residents the opportunity to come and go as they please. Many have a resort-like design, catering to the desire of retirees to enjoy their golden years. Usually the communities consist of apartments or duplex units, and some even offer small cottages.

### Other Healthcare Facilities

Several other types of healthcare facilities deserve attention in the broad overview of the healthcare industry. Diagnostic laboratories offer testing services for patients referred by their physicians. Since the enactment of the Clinical Laboratory Improvement Act (CLIA) in 1967 and its amendment in 1988, many physician offices have stopped providing laboratory tests in their offices. These types of laboratories are called physician office laboratories (POLs). CLIA was enacted to ensure high-quality laboratory testing. The regulations set forth by both OSHA and CLIA rules often made it more cost-effective to have the patient go to an outside laboratory to have the tests done. The medical assistant should note that, as mentioned previously, OSHA is an organization and division of the U.S. Department of Labor that enforces many laws related to workplace safety. CLIA is a law, not an agency. However, both influence safety and quality testing. CLIA is discussed in more detail in Chapter 7.

Home health agencies were tremendously successful in the late 1980s to the mid-1990s, but cuts in Medicare funding have caused them to suffer severe losses in recent years. This concept of care is very popular. Unfortunately, the influx of too many home health agencies and the subsequent drop in payments made to them have resulted in fewer home healthcare providers over the past several years. In addition, many hospitals began offering home healthcare, which added to the already heavy competition that smaller firms faced. Home healthcare offers its patients home care, therapy services, administration and assistance with medications, and other services so that the patient can remain at home yet still obtain the care needed.

Medical suppliers are retail operations that offer all types of medical devices and products. Patients with diabetes can purchase glucose monitoring machines. Special hospital beds can be ordered for those who need them. All types of durable medical equipment (DME), such as bedpans, crutches, bathing assistance devices, wheelchairs, and walkers, are available, often without a physician's prescription. Most medical suppliers serve both the public and the profession.

**Hospice** centers play an important role in the acceptance of terminal illnesses. These facilities are designed to care for the patient with a terminal disease and provide support to family members. The goal of hospice is to provide peace, comfort, and dignity while controlling pain and promoting the best possible quality of life for the patient. Most patients involved in hospice care have a life expectancy of less than 6 months.

### Types of Medical Practice

Medical practices today generally are organized according to one of three types of business structures: the sole proprietorship, the partnership, or the corporation. Sole proprietorships dominated medical practice until the last quarter of the twentieth century. These practices are on the decline as a result of the advent of managed care and its favor of the multispecialty group practice.
CHAPTER 2 The Healthcare Industry

### Sole Proprietorship

A sole proprietor is an individual who holds exclusive right and title to all aspects of the medical practice. The sole proprietor may employ other physicians to participate in the practice. The employed physician is entitled to employee benefits; the owner, however, is not considered an employee and is not so entitled. In addition, the owner would be potentially liable for all of the acts of his or her professional employees and staff members. Although practicing alone has many advantages, including flexibility and independence, it also has significant disadvantages. For example, the owner has total responsibility for covering the practice 24 hours a day, 7 days a week. In an unincorporated solo practice, the business dies when the owner leaves it, unless it is sold to someone else. Many modern physicians do not see sole proprietorship as an avenue for a decent income as a doctor, because managed care companies often offer participation to group practices over the single-practice physician, enabling them to provide more options to the patients. Some doctors organize associate practices. In this case, physicians share office space and often equip and employ their patients, but they operate their practices as sole proprietorships. Agreements such as these should always be put in writing to prevent misunderstandings and legal problems.

### Partnership

When two or more physicians elect to associate in the practice of medicine, they may enter into a partnership agreement. This agreement specifies all the rights, obligations, and responsibilities of each partner. The participants have a greater potential for profit as a partnership than they would in practice as sole proprietors, because various expenses are shared and resources are pooled. Each physician has more freedom, because the doctors rotate an “on call” schedule so that each has some time away from the office and patients. One disadvantage of the partnership is the liability of each for the actions and conduct of all the others. In a partnership arrangement, the partners often pool employees, equipment, insurance, facilities, and even profits, and these resources are divided according to the specifications of the partnership agreement or contract.

A group practice is a body of at least three licensed physicians who engage in full-time practice in a formally organized and legally recognized entity. A group practice may take the form of a partnership, or it may be formed as a corporation. The group may share income and expenses, equipment, records, and personnel and may combine patient care and business management. The group practice may be an association of the same specialty or may be a multispecialty organization. Usually a group practice takes the form of a partnership or corporation.

### Corporation

A corporation may be defined as an artificial entity having a legal and business status that is independent of its shareholders or employees. Corporations are regulated by statutes of the state in which the incorporation takes place. In most cases the physician shareholders are employees of the corporation. Even one physician in a solo practice can incorporate the practice. All employees of the corporation receive income and tax advantages. Corporations are usually able to offer better benefit packages, which may include pension and profit-sharing plans, medical expense reimbursement, life insurance, disability income insurance, and many other benefits.

## HEALTHCARE PROFESSIONALS

### Title of “Doctor”

#### Doctors of Medicine

Medical doctors (Doctors of Medicine [MDs]) are considered allopathic physicians and are the most widely recognized type of physician. They diagnose illness and disease and prescribe treatment for their patients. MDs are allowed to write prescriptions and perform surgery. They offer advice on nutrition and preventive medicine. Becoming an MD usually requires 4 years of undergraduate training (premed) and 4 years of medical school. Some extraordinary students are allowed entry after 3 years of undergraduate studies, but competition for entry into medical school is intense, therefore grades and other experience in healthcare are strongly considered. Premed students study biology, physics, organic and inorganic chemistry, mathematics, English, humanities, and social sciences. There are approximately 125 allopathic medical schools in the United States. After medical school, the student faces 3 to 8 years of internships and residency programs. An intern is a medical student still in training at medical school but treating patients under the supervision of licensed doctors. A residency is a graduate medical education program, often in a specialty, and usually is a paid, on-the-job training hospital position.

Often MDs specialize in a certain field, such as cardiology or pediatrics. These doctors usually invest 3 to 6 years of training in the specialty after medical school and can obtain board certification in one or more of 24 different specialty areas recognized by the American Board of Medical Specialties. An MD must have a state license to practice, and continuing education is required to maintain the license. Graduates of foreign medical schools usually can obtain a license in the United States after passing an examination and completing a residency program in this country. (For more information on types of medical specialties, visit the Evolve site at evolve.elsevier.com/kinn).

#### Doctors of Osteopathy

Osteopathic physicians (Doctors of Osteopathy [DOs]) complete requirements similar to those of MDs to graduate and practice medicine. Osteopaths use medicine and surgery, as well as osteopathic manipulative therapy (OMT), in treating their patients. Andrew Taylor Still is considered the originator of osteopathic medicine, which he began in 1874. He believed in a more holistic approach to medicine, and although he was an MD, he founded the American School of Osteopathy in Kirksville, Missouri. The school originally was chartered to offer an MD degree but later focused more on the osteopathic approach. DOs stress preventive medicine and holistic patient care, as well as a special focus on the musculoskeletal system and OMT. Osteopathic medicine also promotes the innate
ability of the body to heal itself, and many osteopaths tend to take a more conservative approach to using medications and surgical procedures than allopathic physicians. Many DOs practice homeopathy, believing in the body's ability to heal itself. Premed students moving toward osteopathic medicine study biology, physics, organic and inorganic chemistry, mathematics, English, humanities, and social sciences. They also usually complete 4 years of undergraduate studies and then begin 4 years of medical studies at a school for osteopathic medicine. Most DOs participate in a 12-month rotating internship in the various specialty areas before entering a residency program that lasts 2 to 6 years, and they are eligible for board certification through either the American Board of Medical Specialists or the American Osteopathic Association. Approximately one in 20 physicians in the United States is a DO. DOs participate in continuing education programs to renew their licenses annually.

Doctors of Chiropractic

Chiropractors (Doctors of Chiropractic [DCs]) typically are thought of as “bone doctors,” but they actually focus on the nervous system to help patients live healthier lives. The nervous system is the master system of the body, controlling and coordinating all the other systems. Information from the environment, both internal and external, moves through the spinal cord to get to the brain, and in the same manner, information from the brain moves through the spinal cord to reach the body in a two-way flow of communication. The intention of the chiropractic adjustment is to remove any disruptions or distortions of this energy flow that may be caused by slight misalignments, which chiropractors call subluxations. Chiropractic colleges require undergraduate studies in biology, organic and inorganic chemistry, physics, English, and the humanities and then 3 to 4 years studying chiropractic. Each state offers licensing. Some chiropractors devote their practices to a specific specialty, but more often they practice general chiropractic. Continuing education is required for relicensure. Chiropractic is one of the most common fields of alternative medicine.

Hospitalists

Hospitalists are physicians whose primary professional focus is the general medical care of hospitalized patients. Most hospitalists are employed by the healthcare facility instead of having individual freestanding offices in which patients are seen and treated. Perhaps the most attractive benefit of becoming a hospitalist is the quality of life for the physician and his or her family. The hospitalist works a specific, set number of hours each week and does not directly experience the economic pressures of managed care, because they usually are paid on a salary. Although the hospitalist is in charge of the patient while the person is in the hospital, if the patient has a primary care provider (PCP), he or she may still visit the patient. Of course, the patient is not required to use the services of a hospitalist and may be cared for by the PCP. However, patients admitted from the emergency department or those in a location away from the PCP may find the hospitalist to be an excellent alternative to their regular physician.

CRITICAL THINKING APPLICATION 2-5

- Mr. Santos challenges his new medical assisting students to interview several types of doctors at some point during their studies. The class discusses the different philosophies of medicine among allopathic, osteopathic, and chiropractic physicians. Discuss with your class the similarities and differences of these three aspects of medicine.
- Most of Mr. Santos’ students have visited one or more of these types of doctors. What experiences have you had with medical doctors (MDs), osteopaths (DOs), or chiropractors (DCs)?

Dentists

The two basic types of dentists in the United States are Doctors of Dental Medicine (DMDs) and Doctors of Dental Surgery (DDSs). Dentists treat and prevent problems of the teeth and gums and the tissue surrounding them. They can perform oral surgery and write prescriptions for antibiotics and analgesics. Some specialists perform straightening, called orthodontics, and some perform root canal therapy, called endodontics. Dental school usually lasts 4 years after completion of undergraduate studies, and state licensing is required.

Optometrists

The optometrist (OD) is trained and licensed to examine the eyes to test visual acuity and to treat vision defects by prescribing correctional lenses and other optical aids. A program of exercise may be planned for the patient’s eyes. Optometrists study at accredited schools of optometry for 4 years after completing undergraduate studies in the sciences, mathematics, and English. They must be licensed in the state in which they practice. Optometrists should not be confused with ophthalmologists, who are licensed MDs.

Podiatrists

Podiatrists, or Doctors of Podiatric Medicine (DPMs), are educated in the care of the feet, including surgical treatment. Most people spend an extraordinary amount of time on their feet, resulting in wear and tear and chronic pain. Podiatrists are trained to find pressure points and weight-distribution problems. These doctors train for 4 years at accredited colleges after undergraduate studies in the sciences.

Other Doctorates

Other individuals may be called “doctor” based on the degree they have earned in their field. For instance, a person with a PhD has a doctor of philosophy degree in his or her field of expertise and may be addressed as “doctor.” This individual might work as a professor at a university or in a field related to his or her discipline. A PsyD is a Doctor of Psychology, and an EdD is a Doctor of Educational Psychology. Doctors who practice neuropathy, called neuropathic physicians, use only natural means to help the body to heal. These medical professionals are licensed in 15 states.
Licensed Medical Professionals

Many types of licensed medical professionals assist the physician in diagnosing and treating the patient. Some of the professionals whom the medical assistant commonly encounters are listed in this section. (To see a complete list of medical professionals and their job descriptions, visit the Evolve site at evolve.elsevier.com/kimm).

Physician Assistants
Physician assistants (PAs) provide direct patient care services under the supervision of licensed physicians. They are trained to diagnose and treat patients as directed by the physician, and in 46 states and the District of Columbia, they are allowed to write prescriptions. These professionals take patient histories, order and interpret tests, perform physical examinations, and even make diagnostic decisions. They work in physician offices, in hospitals, on military bases, and in other healthcare facilities.

Nurse Practitioners
Nurse practitioners (NPs) provide basic patient care services, including diagnosing and prescribing medications for common illnesses. These professionals must have advanced academic training beyond the registered nurse (RN) degree and also have vast clinical experience. Nurse practitioners usually focus on preventive care and disease prevention. An NP is allowed to practice independently or as a part of a team of healthcare professionals.

Nurse Anesthetists
Nurse anesthetists are registered nurses (RNs) who administer anesthetics to patients during care by surgeons, physicians, dentists, or other qualified health professionals. They practice in many different settings, including offices, traditional hospitals, labor and delivery units, ophthalmology offices, plastic surgery offices, and many others. This practice is quite advanced, and they are compensated well for their skills. Nurse anesthetists can be found in both metropolitan and rural communities.

Registered Nurses
The RN has many career options. Many nurses work in an administrative capacity as managers in hospitals or other types of healthcare facilities. They also provide direct patient care, a role in which they are vital for assessing the patient and providing a care plan. Nurses usually find a specialty area that they enjoy and practice within that area, although they may also “float” to different departments in the hospital. Some function as home health nurses, visiting patients and providing home care. Others work in nursing homes, in public health, or in physicians’ offices.

Licensed Practical and Vocational Nurses
Licensed practical nurses (LPNs) and licensed vocational nurses (LVNs) offer bedside care, assisting with the day-to-day personal care required by inpatients. They assess patients, chart their progress, and administer medications and intravenous fluids where allowed by law. They often work in hospitals or skilled nursing facilities and also are found in physicians’ offices. They sometimes supervise nursing assistants and may also provide patient education services.

Medical Technologists
Medical technologists (MTs) perform diagnostic testing on blood, body fluids, and other types of specimens to assist the physician in arriving at a diagnosis. These professionals work with bacteria and viruses and use their technical skills, combined with their knowledge of disease, to perform their duties. They can make quality-control decisions and can act independently within their profession. Hospitals, teaching universities, research organizations, and laboratories employ most of the medical technologists. Usually they have a Bachelor of Science (BS) degree in addition to certification or a license.

Medical Laboratory Technicians
Medical laboratory technician (MLT) performs most of the same test procedures that the medical technologist performs; the difference between the two is that MLTs do not work independently. They usually are supervised by an MT and have at least an associate’s degree and certification or a license. MLTs work in the same types of facilities as MTs.

Physical Therapists
Physical therapists (PTs) assist patients in regaining their mobility and improving their strength and range of motion, which may have been impaired by an accident or injury or as a result of disease. After assessing the patient, the PT devises a treatment plan in conjunction with the patient’s physician. The goal of the PT is to improve how the patient functions at work and at home.

Respiratory Therapists
Most respiratory therapists (RTs) work in the hospital environment. All types of patients receive respiratory care, including newborns and geriatric patients. RTs commonly use oxygen therapy to assist with breathing, and they also perform diagnostic tests that measure lung capacity.

Occupational Therapists
Occupational therapists (OTs) work with patients who have developed conditions that disable them developmentally, emotionally, mentally, or physically. OTs assist in helping the individual to compensate for loss of function. The goal of OTs is to bring their patients to a functional level where they can live healthy, productive lives.

Diagnostic Cardiac Sonographers
Diagnostic cardiac sonographers or technologists (DCSs or VTs) assist in the diagnosis and treatment of cardiac and vascular diseases and disorders. They perform noninvasive tests, including echocardiographs and electrocardiographs. Often the cardiovascular technician uses ultrasonography to assist the physician in identifying malfunctions of the heart and its structures.
Diagnostic Medical Sonographers
Diagnostic medical sonographers (DMSs) assist physicians in the diagnosis of various disorders by means of ultrasound waves, which produce images of the internal structures of the body. These professionals are often called sonographers. Ultrasonography is used to assist the physician in many ways, including the monitoring of fetal development.

Radiology Technicians
Radiology technicians (RTs) use various machines to help the physician diagnose and treat certain diseases. These machines may include x-ray equipment, ultrasonographic machines, and MRI scanners. RTs explain procedures to patients and know correct positioning techniques, so that the images recorded are accurate and helpful for the diagnosing physician.

Paramedics
Paramedics are specially trained to provide emergency care to patients in life-threatening situations. Paramedics are highly efficient and well versed in the functions of the body. They perform advanced skills and, with more experience, are able to supervise or direct the operations of an emergency care ambulance facility.

Emergency Medical Technicians
Emergency medical technicians (EMTs) progress through several levels of training, each providing more advanced skills. Their medical education encompasses managing respiratory, cardiac, and trauma cases and often emergency childbirth. Some states also recognize specialties within the EMT field, such as EMT Cardiac, which includes training in cardiac arrhythmias, and EMT Shock Trauma, which includes starting intravenous fluids and administration of medication.

Registered Dietitians
Registered dietitians (RDs) have thorough training in nutrition and the different types of diets that patients require to improve or maintain their condition. They use the advice of the physician and information about the patient to design healthy diets during hospital stays and even help to plan menus for home use. They also provide education for the patient about the diet and alternatives that help the patient choose attractive foods.

Patient Education
Some patients have very little knowledge about the healthcare industry and may need instruction and explanations about details important to their healthcare. For instance, many patients do not understand that they may receive several bills after a hospital stay. They often call the physician's office with questions; therefore, medical assistants must understand hospital systems to be able to help the patients. Become familiar with community resources to make referrals for patients that need help from various sources. If a patient seems to have a need, speak with him or her privately and determine whether any agency or organization could help with the issues at hand. Patients will appreciate the medical assistant's willingness to look for ways to help when confronted with problems. Always have an attitude of enthusiasm at every opportunity to assist a patient.

Legal and Ethical Issues
The medical assistant should have a good understanding of the history of medicine and develop an appreciation of those who paved the way to the achievement of today's level of medical technology. These pioneers of medicine should be respected for their efforts to expand and improve healthcare, because many of them sacrificed their reputations and even their lives to prove their theories. Often, they broke the laws of the time to advance medical science. Their historical legacy represents enormous endeavors by these discoverers of new principles, theories, treatments, and cures.

Ethical medical assistants must always strive to serve the patient above the call of duty and continuously work within their scope of practice. Patients expect everyone in the medical field to have ethics above reproach; remember that all actions are under an ethical microscope and must be professional, accurate, and performed in a competent manner. Put the patient first every day at work and always treat the individual with respect and compassion.

CLOSEDING COMMENTS
The healthcare industry is certainly one of the most exciting career fields to enter in today's world. The constant change and development of new technology and theories make medicine an attractive option for career choices. The needs of medicine extend far beyond the boundaries of the United States, and collaborative efforts among countries promote a faster move forward, with new discoveries and hope for those affected by disease. Headlines daily grace newspapers and computer screens, detailing stories of human cloning, designer babies, genetic discoveries, and computer capabilities that amaze us all. Medications are being developed that bring us to the brink of eliminating certain diseases. The mapping of the human genome may lead to incredible breakthroughs in the study of colon, breast, and ovarian cancers, cystic fibrosis, neurologic degeneration, sickle cell anemia, and countless other conditions. There has never been a more thrilling time to become a part of the world of medicine and to make a contribution as a healthcare professional.
SUMMARY OF SCENARIO

Mr. Santos is an effective instructor, and one who is concerned about providing interesting material for his students. He wishes to instill a strong respect in the students for the people who played a role in early medical advances. His classroom discussions will help the students to think about what it was like to present new ideas to the public and often be ridiculed.

While teaching them about the history of medicine and the state of healthcare today, he also provides opportunities for the students to work together in discussion groups and present information to the class. He encourages Internet research, a valuable skill that will help the medical assisting student in many areas of training. By allowing the students to speak in front of the class while giving reports on the medical pioneers, Mr. Santos teaches the students to be more at ease when speaking in public and when articulating instructions and details to patients and co-workers. All of these skills make a well-rounded medical assistant who will become a great asset to the facility in which he or she is employed.

Mr. Santos explains that continuing medical research is critical to the healthcare industry, because new and more effective drugs and treatments are necessary, and because many diseases and conditions do not as yet have a cure. Medical research constantly looks for better ways to make patients well and continually strives to find cures for diseases that medicine has not yet conquered. Medical assistants may work for physicians who are involved in research projects, and this may afford them the opportunity to contribute to medical research.

By providing his students with an overview of the healthcare industry, Mr. Santos helps them to become more familiar with the professionals whom they will encounter in various medical facilities and to have a better awareness of their duties and responsibilities.

SUMMARY OF LEARNING OBJECTIVES

1. Define, spell, and pronounce the terms listed in the vocabulary.
   Spelling and pronouncing medical terms correctly bolster the medical assistant's credibility. Knowing the definition of these terms promotes confidence in communication with patients and co-workers.

2. Identify the ancient cultures that contributed a major portion of our medical terminology.
   Greek and Roman mythology contributed the major portion of the medical terms we use today. Terms have also been borrowed from Anglo-Saxon, German, Arabic, and other sources, including the Bible.

3. Distinguish between and describe the two medical symbols in general use today.
   The American Medical Association adopted the staff of Aesculapius as the symbol of medicine. The symbol is a staff encircled by a serpent. The caduceus often is mistakenly used to represent medicine but is actually the medical insignia of the U.S. Army Medical Corps. This icon is a staff encircled by two serpents, bearing wings at the top.

4. Explain the history of medicine and how it has affected today's medical industry.
   The history of medicine clearly influences medical practice today, because yesterday's discoveries are today's medications and treatments. Research is an ongoing necessity in the medical field. As technology becomes more and more sophisticated, medical advancements follow.

5. Explain why a medical education at Johns Hopkins was considered superior, even in its early years.
   Johns Hopkins University Medical School has been recognized as a leader in healthcare education for over a century. The university was one of the first institutions to partner with a hospital for training purposes, resulting in its superior medical education. Johns Hopkins had a research department as well, where faculty members investigated new methods and treatments for patients. Combining the medical education with readily available patients brought the discovery of illness and disease into a new light for early medical students. Today Johns Hopkins is a multibillion-dollar organization, incorporating three acute care hospitals and other entities in an integrated healthcare system.

6. List several medical pioneers and discuss the importance of their contributions to the medical profession.
   Numerous early pioneers made tremendous contributions to the medical field. Constant growth and research have pressed the medical profession forward, and with the assistance of technology, the growth speeds along today faster than ever.

7. Explain the roles of the world healthcare organizations.
   World healthcare organizations provide information, medication, and personnel to attempt to eradicate diseases and treat the diseases for which no cure exists. Many of these organizations operate with restricted funding and rely often on volunteer donations and volunteer workers to operate. These agencies often work together in an effort to solve problems of epidemics effectively and learn more about diseases. All of the national healthcare organizations are a vital part of the medical industry today.

8. Identify the role of the Centers for Disease Control (CDC) regulations in healthcare settings.
   The CDC is a clearinghouse for information and statistics associated with healthcare. Several divisions within the CDC focus on specific health-related issues, such as the National Center for HIV, STD, and TB Prevention; the Public Health Practice Program Office; the National Center on Birth Defects and Developmental Disabilities; and the National Center for Health Statistics. Branch offices are located throughout the United States and in several foreign countries. The CDC provides regulations that affect all healthcare facilities. When the virus now known as HIV was discovered, the CDC was one of the first organizations to research and attempt
to isolate the virus. When a pandemic begins, the CDC information services offer guidelines that help facilities ensure the health of their employees, patients, and the public at large.

9. Discuss the various types of ambulatory care.
Physicians’ offices, group practices, and multispecialty group practices are a few types of ambulatory care. This division of medicine also includes occupational health centers, dialysis centers, rehabilitation clinics, and sleep centers. Patients who are ambulatory are able to move from place to place, usually on their own or with the assistance of a wheelchair or walker.

10. Distinguish among different types of doctors and medical practices.
Three main provider portals of entry into the healthcare system exist today: medical doctors, osteopathic physicians, and chiropractic physicians. These different disciplines have some similar training, but osteopathic physicians usually use a holistic approach, and chiropractors concentrate many of their efforts on the alignment of the spine in an effort to promote a healing of the body. Most physicians work in a sole proprietorship, a group practice, or a healthcare corporation.

11. Identify the medical specialties recognized by the American Board of Medical Specialties.
Numerous specialties focus on particular areas of the practice of medicine. The American Board of Medical Specialties recognizes more than 20 specialty groups, which support various organizations designed to promote that particular branch of medicine. Although other specialties and subspecialties of medicine exist, the most common and most generally recognized are those associated with the American Board of Medical Specialties.

12. Compare and contrast the allied health professions and understand their relation to medical assisting.
The American Medical Association recognizes more than 60 allied healthcare occupations. These allied health professionals contribute to the field of medicine, each playing a specific role in the healthcare industry. Details about many of these professions are available on the Evolve website. The medical assistant works as a part of the healthcare team with all of these professionals.

CONNECTIONS

Study Guide Connection: Go to the Chapter 2 Study Guide. Read and complete the activities.

Evolve Connection: Go to the Chapter 2 link at evolve.elsevier.com/kimm to complete the Chapter Review and Chapter Quiz. Peruse other resources listed for this chapter to increase your knowledge of The Healthcare Industry.