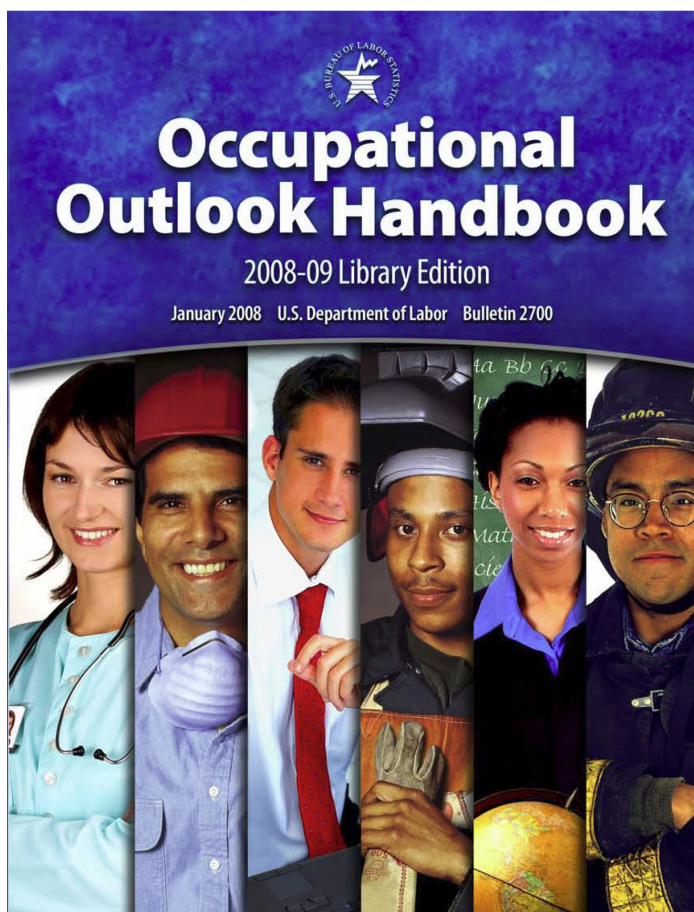


Health Diagnosing and Treating Practitioners



Reprinted from the
Occupational Outlook Handbook, 2008-09 Edition

U.S. Department of Labor
Bureau of Labor Statistics



Occupations Included in this Reprint

- Audiologists
- Chiropractors
- Dentists
- Dietitians and nutritionists
- Occupational therapists
- Optometrists
- Pharmacists
- Physical therapists
- Physician assistants
- Physicians and surgeons
- Podiatrists
- Radiation therapists
- Recreational therapists
- Registered nurses
- Respiratory therapists
- Speech-language pathologists
- Veterinarians

Audiologists

(O*NET 29-1121.00)

Significant Points

- More than half worked in health care facilities; many others were employed by educational services.
- A master's degree in audiology (hearing) is the standard level of education required; however, a doctoral degree is becoming more common for new entrants.
- Few openings are expected because of the small size of the occupation.
- Job prospects will be favorable for those possessing the doctoral (Au.D.) degree.

Nature of the Work

Audiologists work with people who have hearing, balance, and related ear problems. They examine individuals of all ages and identify those with the symptoms of hearing loss and other auditory, balance, and related sensory and neural problems. They then assess the nature and extent of the problems and help the individuals manage them. Using audiometers, computers, and other testing devices, they measure the loudness at which a person begins to hear sounds, the ability to distinguish between sounds, and the impact of hearing loss on an individual's daily life. In addition, audiologists use computer equipment to evaluate and diagnose balance disorders. Audiologists interpret these results and may coordinate them with medical, educational, and psychological information to make a diagnosis and determine a course of treatment.

Hearing disorders can result from a variety of causes including trauma at birth, viral infections, genetic disorders, exposure to loud noise, certain medications, or aging. Treatment may include examining and cleaning the ear canal, fitting and dispensing hearing aids, and fitting and programming cochlear implants. Audiologic treatment also includes counseling on adjusting to hearing loss, training on the use of hearing instruments, and teaching communication strategies for use in a variety of environments. For example, they may provide instruction in listening strategies. Audiologists also may recommend, fit, and dispense personal or large area amplification systems and alerting devices.

In audiology clinics, audiologists may independently develop and carry out treatment programs. They keep records on the initial evaluation, progress, and discharge of patients. In other settings, audiologists may work with other health and education providers as part of a team in planning and implementing services for children and adults. Audiologists who diagnose and treat balance disorders often work in collaboration with physicians, and physical and occupational therapists.

Some audiologists specialize in work with the elderly, children, or hearing-impaired individuals who need special treatment programs. Others develop and implement ways to protect workers' hearing from on-the-job injuries. They measure noise



Audiologists usually work at a desk or table in clean, comfortable surroundings.

levels in workplaces and conduct hearing protection programs in factories and in schools and communities.

Audiologists who work in private practice also manage the business aspects of running an office, such as developing a patient base, hiring employees, keeping records, and ordering equipment and supplies.

A few audiologists conduct research on types of, and treatment for, hearing, balance, and related disorders. Others design and develop equipment or techniques for diagnosing and treating these disorders.

Work environment. Audiologists usually work at a desk or table in clean, comfortable surroundings. The job is not physically demanding but does require attention to detail and intense concentration. The emotional needs of patients and their families may be demanding. Most full-time audiologists work about 40 hours per week, which may include weekends and evenings to meet the needs of patients. Some work part time. Those who work on a contract basis may spend a substantial amount of time traveling between facilities.

Training, Other Qualifications, and Advancement

All States require audiologists to be licensed or registered. Licensure or registration requires at least a master's degree in audiology; however, a first professional, or doctoral, degree is becoming increasingly necessary.

Education and training. Individuals must have at least a master's degree in audiology to qualify for a job. However, a first professional or doctoral degree is becoming more common. As of early 2007, eight States required a doctoral degree or its equivalent. The professional doctorate in audiology (Au.D.) requires approximately 8 years of university training and supervised professional experience.

In early 2007, the Accreditation Commission of Audiology Education accredited more than 50 Au.D. programs and the Council on Academic Accreditation in Audiology and Speech-Language Pathology (CAA) accredited over 70 graduate programs in audiology. Graduation from an accredited program may be required to obtain a license in some States. Requirements for admission to programs in audiology include courses in English, mathematics, physics, chemistry, biology, psychology, and communication. Graduate coursework in audiology includes anatomy; physiology; physics; genetics; normal and

abnormal communication development; auditory, balance, and neural systems assessment and treatment; diagnosis and treatment; pharmacology; and ethics.

Licensure and certification. Audiologists are regulated by licensure or registration in all 50 States. Forty-one States have continuing education requirements for licensure renewal, the number of hours required varies by State. Twenty States and the District of Columbia also require audiologists to have a Hearing Aid Dispenser license to dispense hearing aids; for the remaining 30 States, an audiologist license is all that is needed to dispense hearing aids. Third-party payers generally require practitioners to be licensed to qualify for reimbursement. States set requirements for education, mandating a master’s or doctoral degree, as well as other requirements. For information on the specific requirements of your State, contact that State’s licensing board.

In some States, specific certifications from professional associations satisfy some or all of the requirements for State licensure. Certification can be obtained from two certifying bodies. Audiologists can earn the Certificate of Clinical Competence in Audiology (CCC-A) offered by the American Speech-Language-Hearing Association; they may also be certified through the American Board of Audiology.

Other qualifications. Audiologists should be able to effectively communicate diagnostic test results, diagnoses, and proposed treatments in a manner easily understood by their patients. They must be able to approach problems objectively and provide support to patients and their families. Because a patient’s progress may be slow, patience, compassion, and good listening skills are necessary.

It is important for audiologists to be aware of new diagnostic and treatment technologies. Most audiologists participate in continuing education courses to learn new methods and technologies.

Advancement. With experience, audiologists can advance to open their own private practice. Audiologist working in hospitals and clinics can advance to management or supervisory positions.

Employment

Audiologists held about 12,000 jobs in 2006. More than half of all jobs were in health care facilities—offices of physicians or other health practitioners, including audiologists; hospitals; and outpatient care centers. About 13 percent of jobs were in educational services, including elementary and secondary schools. Other jobs for audiologists were in health and personal care stores, including hearing aid stores; scientific research and development services; and State and local governments.

A small number of audiologists were self-employed in private practice. They provided hearing health care services in

their own offices or worked under contract for schools, health care facilities, or other establishments.

Job Outlook

Average employment growth is projected. However, because of the small size of the occupation, few job openings are expected. Job prospects will be favorable for those possessing the Au.D. degree.

Employment change. Employment of audiologists is expected to grow 10 percent from 2006 to 2016, about as fast as the average for all occupations. Hearing loss is strongly associated with aging, so rapid growth in older population groups will cause the number of people with hearing and balance impairments to increase markedly. Medical advances also are improving the survival rate of premature infants and trauma victims, who then need assessment and sometimes treatment. Greater awareness of the importance of early identification and diagnosis of hearing disorders in infants also will increase employment. A number of States require that newborns be screened for hearing loss and receive appropriate early intervention services.

Employment in educational services will increase along with growth in elementary and secondary school enrollments, including enrollment of special education students.

Growth in employment of audiologists will be moderated by limitations on reimbursements made by third-party payers for the tests and services they provide.

Job prospects. Job prospects will be favorable for those possessing the Au.D. degree. Only a few job openings for audiologists will arise from the need to replace those who leave the occupation, because the occupation is relatively small and workers tend to stay in this occupation until they retire.

Earnings

Median annual earnings of wage-and-salary audiologists were \$57,120 in May 2006. The middle 50 percent earned between \$47,220 and \$70,940. The lowest 10 percent earned less than \$38,370, and the highest 10 percent earned more than \$89,160. Some employers may pay for continuing education courses.

Related Occupations

Audiologists specialize in the prevention, diagnosis, and treatment of hearing problems. Workers in related occupations include occupational therapists, optometrists, physical therapists, psychologists, recreational therapists, rehabilitation counselors, and speech-language pathologists.

Sources of Additional Information

State licensing boards can provide information on licensure requirements. State departments of education can supply information on certification requirements for those who wish to work in public schools.

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Audiologists	29-1121	12,000	13,000	1,200	10

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

For information on the specific requirements of your State, contact that State's licensing board. Career information, a description of the CCC-A credential, and information on State licensure is available from:

➤ American Speech-Language-Hearing Association, 10801 Rockville Pike, Rockville, MD 20852.

Internet: <http://www.asha.org>

Information on American Board of Audiology certification is available from:

➤ American Board of Audiology, 11730 Plaza America Dr., Suite 300, Reston, VA 20190.

Internet: <http://www.americanboardofaudiology.org>

For information on the Au.D. degree, contact:

➤ Audiology Foundation of America, 8 N. 3rd St., Suite 406, Lafayette, IN 47901. Internet: <http://www.audfound.org>

Chiropractors

(O*NET 29-1011.00)

Significant Points

- Job prospects should be good; employment is expected to grow faster than average because of increasing consumer demand for alternative health care.
- Chiropractors must be licensed, requiring 2 to 4 years of undergraduate education, the completion of a 4-year chiropractic college course, and passing scores on national and State examinations.
- About 52 percent of chiropractors were self employed.
- Earnings are relatively low in the beginning but increase as the practice grows.

Nature of the Work

Chiropractors, also known as *doctors of chiropractic* or *chiropractic physicians*, diagnose and treat patients with health problems of the musculoskeletal system and treat the effects of those problems on the nervous system and on general health. Many chiropractic treatments deal specifically with the spine and the manipulation of the spine. Chiropractic medicine is based on the principle that spinal joint misalignments interfere with the nervous system and can result in lower resistance to disease and many different conditions of diminished health.

The chiropractic approach to health care stresses the patient's overall health. Chiropractors provide natural, drugless, nonsurgical health treatments, relying on the body's inherent recuperative abilities. They also recognize that many factors affect health, including exercise, diet, rest, environment, and heredity. Chiropractors recommend changes in lifestyle that affect those factors. In some situations, chiropractors refer patients to or consult with other health practitioners.

Like other health practitioners, chiropractors follow a standard routine to get information needed to diagnose and treat patients. They take the patient's medical history; conduct physical, neurological, and orthopedic examinations; and may

order laboratory tests. X-rays and other diagnostic images are important tools because of the chiropractor's emphasis on the spine and its proper function. Chiropractors also analyze the patient's posture and spine using a specialized technique. For patients whose health problems can be traced to the musculoskeletal system, chiropractors manually adjust the spinal column.

Some chiropractors use other alternative medicines in their practices, including therapies using water, light, massage, ultrasound, electric, acupuncture, and heat. They also may apply supports such as straps, tapes, and braces to manually adjust the spine. Chiropractors counsel patients about health concepts such as nutrition, exercise, changes in lifestyle, and stress management, but chiropractors do not prescribe drugs or perform surgery.

In addition to general chiropractic practice, some chiropractors specialize in sports injuries, neurology, orthopedics, pediatrics, nutrition, internal disorders, or diagnostic imaging.

Many chiropractors are solo or group practitioners who also have the administrative responsibilities of running a practice. In larger offices, chiropractors delegate these tasks to office managers and chiropractic assistants. Chiropractors in private practice are responsible for developing a patient base, hiring employees, and keeping records.



Chiropractors provide natural, drugless, nonsurgical health treatments to patients, including spinal adjustments.

Work environment. Chiropractors work in clean, comfortable offices. Like other health practitioners, chiropractors are sometimes on their feet for long periods. Chiropractors who take x-rays must employ appropriate precautions against the dangers of repeated exposure to radiation.

Chiropractors work, on average, about 40 hours per week, although longer hours are not uncommon. Solo practitioners set their own hours but may work evenings or weekends to accommodate patients. Like other health care practitioners, chiropractors in a group practice will sometimes be on call or treat patients of other chiropractors in the group.

Training, Other Qualifications, and Advancement

Chiropractors must be licensed, which requires 2 to 4 years of undergraduate education, the completion of a 4-year chiropractic college course, and passing scores on national and State examinations.

Education and training. In 2007, 16 chiropractic programs and 2 chiropractic institutions in the United States were accredited by the Council on Chiropractic Education. Applicants must have at least 90 semester hours of undergraduate study leading toward a bachelor’s degree, including courses in English, the social sciences or humanities, organic and inorganic chemistry, biology, physics, and psychology. Many applicants have a bachelor’s degree, which may eventually become the minimum entry requirement. Several chiropractic colleges offer prechiropractic study, as well as a bachelor’s degree program. Recognition of prechiropractic education offered by chiropractic colleges varies among the States.

Chiropractic programs require a minimum of 4,200 hours of combined classroom, laboratory, and clinical experience. During the first 2 years, most chiropractic programs emphasize classroom and laboratory work in sciences such as anatomy, physiology, public health, microbiology, pathology, and biochemistry. The last 2 years focus on courses in manipulation and spinal adjustment and provide clinical experience in physical and laboratory diagnosis, neurology, orthopedics, geriatrics, physiotherapy, and nutrition. Chiropractic programs and institutions grant the degree of Doctor of Chiropractic.

Chiropractic colleges also offer postdoctoral training in orthopedics, neurology, sports injuries, nutrition, rehabilitation, radiology, industrial consulting, family practice, pediatrics, and applied chiropractic sciences. Once such training is complete, chiropractors may take specialty exams leading to “diplomate” status in a given specialty. Exams are administered by specialty chiropractic associations.

Licensure. All States and the District of Columbia regulate the practice of chiropractic and grant licenses to chiropractors who meet the educational and examination requirements established by the State. Chiropractors can practice only in States where they are licensed. Some States have agreements per-

mitting chiropractors licensed in one State to obtain a license in another without further examination, provided that their educational, examination, and practice credentials meet State specifications.

Most State licensing boards require at least 2 years of undergraduate education, but an increasing number are requiring a 4-year bachelor’s degree. All boards require the completion of a 4-year program at an accredited chiropractic college leading to the Doctor of Chiropractic degree.

For licensure, most State boards recognize either all or part of the four-part test administered by the National Board of Chiropractic Examiners. State examinations may supplement the National Board tests, depending on State requirements. All States except New Jersey require the completion of a specified number of hours of continuing education each year in order to maintain licensure. Chiropractic associations and accredited chiropractic programs and institutions offer continuing education programs.

Other qualifications. Chiropractic requires keen observation to detect physical abnormalities. It also takes considerable manual dexterity, but not unusual strength or endurance, to perform adjustments. Chiropractors should be able to work independently and handle responsibility. As in other health-related occupations, empathy, understanding, and the desire to help others are good qualities for dealing effectively with patients.

Advancement. Newly licensed chiropractors can set up a new practice, purchase an established one, or enter into partnership with an established practitioner. They also may take a salaried position with an established chiropractor, a group practice, or a health care facility

Employment

Chiropractors held about 53,000 jobs in 2006. Most chiropractors work in a solo practice, although some are in group practice or work for other chiropractors. A small number teach, conduct research at chiropractic institutions, or work in hospitals and clinics. Approximately 52 percent of chiropractors were self employed.

Many chiropractors are located in small communities. However, the distribution of chiropractors is not geographically uniform. This occurs primarily because new chiropractors frequently establish their practices in close proximity to one of the few chiropractic educational institutions.

Job Outlook

Employment is expected to grow faster than average because of increasing consumer demand for alternative health care. Job prospects should be good.

Employment change. Employment of chiropractors is expected to increase 14 percent between 2006 and 2016, faster than the average for all occupations. Projected job growth

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Chiropractors.....	29-1011	53,000	60,000	7,600	14

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

stems from increasing consumer demand for alternative health care. Because chiropractors emphasize the importance of healthy lifestyles and do not prescribe drugs or perform surgery, chiropractic care is appealing to many health-conscious Americans. Chiropractic treatment of the back, neck, extremities, and joints has become more accepted as a result of research and changing attitudes about alternative, noninvasive health care practices. The rapidly expanding older population, with its increased likelihood of mechanical and structural problems, also will increase demand for chiropractors.

Demand for chiropractic treatment, however, is related to the ability of patients to pay, either directly or through health insurance. Although more insurance plans now cover chiropractic services, the extent of such coverage varies among plans. Chiropractors must educate communities about the benefits of chiropractic care in order to establish a successful practice.

Job prospects. Job prospects for new chiropractors are expected to be good. In this occupation, replacement needs arise almost entirely from retirements. Chiropractors usually remain in the occupation until they retire; few transfer to other occupations. Establishing a new practice will be easiest in areas with a low concentration of chiropractors.

Earnings

Median annual earnings of salaried chiropractors were \$65,220 in 2006. The middle 50 percent earned between \$45,710 and \$96,500 a year.

In 2005, the mean salary for chiropractors was \$104,363 according to a survey conducted by Chiropractic Economics magazine.

In chiropractic, as in other types of independent practice, earnings are relatively low in the beginning and increase as the practice grows. Geographic location and the characteristics and qualifications of the practitioner also may influence earnings.

Salaried chiropractors typically receive health insurance and retirement benefits from their employers, whereas self-employed chiropractors must provide for their own health insurance and retirement.

Related Occupations

Chiropractors treat patients and work to prevent bodily disorders and injuries. So do athletic trainers, massage therapists, occupational therapists, physical therapists, physicians and surgeons, podiatrists, and veterinarians.

Sources of Additional Information

General information on a career as a chiropractor is available from the following organizations:

➤ American Chiropractic Association, 1701 Clarendon Blvd., Arlington, VA 22209. Internet: <http://www.acatoday.org>

➤ International Chiropractors Association, 1110 North Glebe Rd., Suite 650, Arlington, VA 22201.

Internet: <http://www.chiropractic.org>

➤ World Chiropractic Alliance, 2950 N. Dobson Rd., Suite 3, Chandler, AZ 85224.

For a list of chiropractic programs and institutions, as well as general information on chiropractic education, contact:

➤ Council on Chiropractic Education, 8049 North 85th Way, Scottsdale, AZ 85258-4321. Internet: <http://www.cce-usa.org>

For information on State education and licensure requirements, contact:

➤ Federation of Chiropractic Licensing Boards, 5401 W. 10th St., Suite 101, Greeley, CO 80634-4400.

Internet: <http://www.fclb.org>

For more information on the national chiropractic licensing exam, contact:

➤ National Board of Chiropractic Examiners, 901 54th Ave., Greeley, CO 80634-4400. Internet: <http://www.nbce.org>

For information on admission requirements to a specific chiropractic college, as well as scholarship and loan information, contact the college's admissions office.

Dentists

(O*NET 29-1021.00, 29-1022.00, 29-1023.00, 29-1024.00, 29-1029.99)

Significant Points

- Most dentists are solo practitioners.
- Dentists usually complete at least 8 years of education beyond high school.
- Average employment growth will generate some job openings, but most openings will result from the need to replace the large number of dentists expected to retire.
- Job prospects should be good.

Nature of the Work

Dentists diagnose and treat problems with teeth and tissues in the mouth, along with giving advice and administering care to help prevent future problems. They provide instruction on diet, brushing, flossing, the use of fluorides, and other aspects of dental care. They remove tooth decay, fill cavities, examine x-rays, place protective plastic sealants on children's teeth, straighten teeth, and repair fractured teeth. They also perform corrective surgery on gums and supporting bones to treat gum diseases. Dentists extract teeth and make models and measurements for dentures to replace missing teeth. They also administer anesthetics and write prescriptions for antibiotics and other medications.

Dentists use a variety of equipment, including x-ray machines, drills, mouth mirrors, probes, forceps, brushes, and scalpels. They wear masks, gloves, and safety glasses to protect themselves and their patients from infectious diseases.

Dentists in private practice oversee a variety of administrative tasks, including bookkeeping and the buying of equipment and supplies. They may employ and supervise dental hygienists, dental assistants, dental laboratory technicians, and receptionists. (These occupations are described elsewhere in the *Handbook*.)

Most dentists are general practitioners, handling a variety of dental needs. Other dentists practice in any of nine specialty areas. *Orthodontists*, the largest group of specialists, straighten teeth by applying pressure to the teeth with braces or retainers. The next largest group, *oral and maxillofacial surgeons*, operates on the mouth and jaws. The remainder may specialize as *pediatric dentists* (focusing on dentistry for children); *periodontists* (treating gums and bone supporting the teeth); *prosthodontists* (replacing missing teeth with permanent fixtures, such as crowns and bridges, or with removable fixtures such as dentures); *endodontists* (performing root canal therapy); *public health dentists* (promoting good dental health and preventing dental diseases within the community); *oral pathologists* (studying oral diseases); or *oral and maxillofacial radiologists* (diagnosing diseases in the head and neck through the use of imaging technologies).

Work environment. Most dentists are solo practitioners, meaning that they own their own businesses and work alone or with a small staff. Some dentists have partners, and a few work for other dentists as associate dentists.

Most dentists work 4 or 5 days a week. Some work evenings and weekends to meet their patients' needs. The number of hours worked varies greatly among dentists. Most full-time dentists work between 35 and 40 hours a week. However, oth-



Dentists use various equipment to diagnose and treat problems with teeth and tissues in the mouth.

ers, especially those who are trying to establish a new practice, work more. Also, experienced dentists often work fewer hours. It is common for dentists to continue in part-time practice well beyond the usual retirement age.

Training, Other Qualifications, and Advancement

All 50 States and the District of Columbia require dentists to be licensed. To qualify for a license in most States, candidates must graduate from an accredited dental school and pass written and practical examinations.

Education and training. In 2006, there were 56 dental schools accredited by the American Dental Association's (ADA's) Commission on Dental Accreditation. Dental schools require a minimum of 2 years of college-level pre-dental education prior to admittance. Most dental students have at least a bachelor's degree before entering dental school, although a few applicants are accepted to dental school after 2 or 3 years of college and complete their bachelor's degree while attending dental school.

High school and college students who want to become dentists should take courses in biology, chemistry, physics, health, and mathematics. College undergraduates planning on applying to dental school are required to take many science courses. Because of this, some choose a major in a science, such as biology or chemistry, while others take the required science coursework while pursuing a major in another subject.

All dental schools require applicants to take the Dental Admissions Test (DAT). When selecting students, schools consider scores earned on the DAT, applicants' grade point averages, and information gathered through recommendations and interviews. Competition for admission to dental school is keen.

Dental school usually lasts 4 academic years. Studies begin with classroom instruction and laboratory work in science, including anatomy, microbiology, biochemistry, and physiology. Beginning courses in clinical sciences, including laboratory techniques, are also completed. During the last 2 years, students treat patients, usually in dental clinics, under the supervision of licensed dentists. Most dental schools award the degree of Doctor of Dental Surgery (DDS). Others award an equivalent degree, Doctor of Dental Medicine (DMD).

Some dental school graduates work for established dentists as associates for 1 to 2 years to gain experience and save money to equip an office of their own. Most dental school graduates, however, purchase an established practice or open a new one immediately after graduation.

Licensure. Licensure is required to practice as a dentist. In most States, licensure requires passing written and practical examinations in addition to having a degree from an accredited dental school. Candidates may fulfill the written part of the State licensing requirements by passing the National Board Dental Examinations. Individual States or regional testing agencies administer the written or practical examinations.

In 2006, 17 States licensed or certified dentists who intended to practice in a specialty area. Requirements include 2 to 4 years of postgraduate education and, in some cases, the completion of a special State examination. Most State licenses permit dentists to engage in both general and specialized practice.

Other qualifications. Dentistry requires diagnostic ability and manual skills. Dentists should have good visual memory, excellent judgment regarding space, shape, and color, a high degree of manual dexterity, and scientific ability. Good business sense, self-discipline, and good communication skills are helpful for success in private practice.

Advancement. Dentists who want to teach or conduct research usually spend an additional 2 to 5 years in advanced dental training, in programs operated by dental schools or hospitals. A recent survey by the American Dental Education Association showed that 11 percent of new graduates enrolled in postgraduate training programs to prepare for a dental specialty.

Employment

Dentists held about 161,000 jobs in 2006. Employment was distributed among general practitioners and specialists as follows:

Dentists, general.....	136,000
Orthodontists.....	9,200
Oral and maxillofacial surgeons	7,700
Prosthodontists.....	1,000
Dentists, all other specialists.....	6,900

About one third of dentists were self-employed and not incorporated. Almost all dentists work in private practice. According to the ADA, about 3 out of 4 dentists in private practice are sole proprietors, and 1 in 7 belongs to a partnership. A few salaried dentists work in hospitals and offices of physicians.

Job Outlook

Average employment growth will generate some job openings, but most openings will result from the need to replace the large number of dentists expected to retire. Job prospects should be good as new dentists take over established practices or start their own.

Employment change. Employment of dentists is projected to grow nine percent through 2016, about as fast as the average for all occupations. The demand for dental services is expected to continue to increase. The overall population is growing, particularly the number of older people, which will increase the demand for dental care. As members of the baby-boom generation advance into middle age, a large number will need complicated dental work, such as bridges. In addition, elderly people are more likely to retain their teeth than were their predecessors, so they will require much more care than in the past. The

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Dentists	29-1020	161,000	176,000	15,000	9
Dentists, general.....	29-1021	136,000	149,000	13,000	9
Oral and maxillofacial surgeons	29-1022	7,700	8,400	700	9
Orthodontists.....	29-1023	9,200	10,000	800	9
Prosthodontists.....	29-1024	1,000	1,100	100	11
Dentists, all other specialists.....	29-1029	6,900	7,400	500	7

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

younger generation will continue to need preventive checkups despite an overall increase in the dental health of the public over the last few decades. Recently, some private insurance providers have increased their dental coverage. If this trend continues, those with new or expanded dental insurance will be more likely to visit a dentist than in the past. Also, while they are currently a small proportion of dental expenditures, cosmetic dental services, such as fitting braces for adults as well as children and providing teeth-whitening treatments, have become increasingly popular.

However, employment of dentists is not expected to keep pace with the increased demand for dental services. Productivity increases from new technology, as well as having dental hygienists and assistants perform some tasks, will allow dentists to perform more work than they have in the past. As their practices expand, dentists are likely to hire more hygienists and dental assistants to handle routine services.

Dentists will increasingly provide care and instruction aimed at preventing the loss of teeth, rather than simply providing treatments such as fillings. Improvements in dental technology also will allow dentists to offer more effective and less painful treatment to their patients.

Job prospects. As an increasing number of dentists from the baby-boom generation reach retirement age, many of them will retire or work fewer hours. However, the number of applicants to, and graduates from, dental schools has increased in recent years. Therefore, younger dentists will be able to take over the work from older dentists who retire or cut back on hours, as well as provide dental services to accommodate the growing demand.

Demand for dental services tends to follow the business cycle, primarily because these services usually are paid for either by the patient or by private insurance companies. As a result, during slow times in the economy, demand for dental services can decrease; dentists may have difficulty finding employment, or if already in an established practice, they may work fewer hours because of reduced demand.

Earnings

Median annual earnings of salaried dentists were \$136,960 in May 2006. Earnings vary according to number of years in practice, location, hours worked, and specialty. Self-employed dentists in private practice tend to earn more than do salaried dentists.

Dentists who are salaried often receive benefits paid by their employer, with health insurance and malpractice insurance be-

ing among the most common. However, like other business owners, self-employed dentists must provide their own health insurance, life insurance, retirement plans, and other benefits.

Related Occupations

Dentists examine, diagnose, prevent, and treat diseases and abnormalities. Chiropractors, optometrists, physicians and surgeons, podiatrists, psychologists, and veterinarians do similar work.

Sources of Additional Information

For information on dentistry as a career, a list of accredited dental schools, and a list of State boards of dental examiners, contact:

► American Dental Association, Commission on Dental Accreditation, 211 E. Chicago Ave., Chicago, IL 60611.

Internet: <http://www.ada.org>

For information on admission to dental schools, contact:

► AmericanDentalEducationAssociation, 1400KSt.NW., Suite 1100, Washington, DC 20005. Internet: <http://www.adea.org>

Persons interested in practicing dentistry should obtain the requirements for licensure from the board of dental examiners of the State in which they plan to work.

To obtain information on scholarships, grants, and loans, including Federal financial aid, prospective dental students should contact the office of student financial aid at the schools to which they apply.

Dietitians and Nutritionists

(O*NET 29-1031.00)

Significant Points

- Most jobs are in hospitals, nursing care facilities, outpatient care centers, and offices of physicians or other health practitioners.
- Dietitians and nutritionists need at least a bachelor's degree in dietetics, foods and nutrition, food service systems management, or a related area; licensure, certification, or registration requirements vary by State.
- Employment is projected to grow about as fast as the average for all occupations; however, growth may be constrained if employers substitute other workers for dietitians and if limitations are placed on insurance reimbursement for dietetic services.
- Good job opportunities are expected.

Nature of the Work

Dietitians and nutritionists plan food and nutrition programs, supervise meal preparation, and oversee the serving of meals. They prevent and treat illnesses by promoting healthy eating habits and recommending dietary modifications. For example, dietitians might teach a patient with high blood pressure how to use less salt when preparing meals, or create a diet reduced in fat and sugar for an overweight patient.

Dietitians manage food service systems for institutions such as hospitals and schools, promote sound eating habits through

education, and conduct research. Many dietitians specialize, becoming a clinical dietitian, community dietitian, management dietitian, or consultant.

Clinical dietitians provide nutritional services to patients in hospitals, nursing care facilities, and other institutions. They assess patients' nutritional needs, develop and implement nutrition programs, and evaluate and report the results. They also confer with doctors and other health care professionals to coordinate medical and nutritional needs. Some clinical dietitians specialize in managing the weight of overweight patients or in the care of renal (kidney), diabetic, or critically ill patients. In addition, clinical dietitians in nursing care facilities, small hospitals, or correctional facilities may manage the food service department.

Community dietitians counsel individuals and groups on nutritional practices designed to prevent disease and promote health. Working in places such as public health clinics, home health agencies, and health maintenance organizations, community dietitians evaluate individual needs, develop nutritional care plans, and instruct individuals and their families. Dietitians working in home health agencies provide instruction on grocery shopping and food preparation to the elderly, children, and individuals with special needs.

Increased public interest in nutrition has led to job opportunities in food manufacturing, advertising, and marketing. In these areas, dietitians analyze foods, prepare literature for distribution, or report on issues such as dietary fiber, vitamin supplements, or the nutritional content of recipes.

Management dietitians oversee large-scale meal planning and preparation in health care facilities, company cafeterias, prisons, and schools. They hire, train, and direct other dietitians and food service workers; budget for and purchase food, equipment, and supplies; enforce sanitary and safety regulations; and prepare records and reports.



Dietitians and nutritionists plan food and nutrition programs to reach the client's health goals.

Consultant dietitians work under contract with health care facilities or in their own private practice. They perform nutrition screenings for their clients and offer advice on diet-related concerns such as weight loss and cholesterol reduction. Some work for wellness programs, sports teams, supermarkets, and other nutrition-related businesses. They may consult with food service managers, providing expertise in sanitation, safety procedures, menu development, budgeting, and planning.

Work environment. Dietitians and nutritionists usually work in clean, well-lighted, and well-ventilated areas. However, some work in hot, congested kitchens. Many dietitians and nutritionists are on their feet for much of the workday.

Most full-time dietitians and nutritionists work a regular 40-hour week, although some work weekends. About 1 in 3 worked part time in 2006.

Training, Other Qualifications, and Advancement

Dietitians and nutritionists need at least a bachelor's degree. Licensure, certification, or registration requirements vary by State.

Education and training. Becoming a dietitian or nutritionist usually requires at least a bachelor's degree in dietetics, foods and nutrition, food service systems management, or a related area. Graduate degrees also are available. College students in these majors take courses in foods, nutrition, institution management, chemistry, biochemistry, biology, microbiology, and physiology. Other suggested courses include business, mathematics, statistics, computer science, psychology, sociology, and economics. High school students interested in becoming a dietitian or nutritionist should take courses in biology, chemistry, mathematics, health, and communications.

As of 2007, there were 281 bachelor's degree programs and 22 master's degree programs approved by the American Dietetic Association's Commission on Accreditation for Dietetics Education.

Licensure. Of the 48 States and jurisdictions with laws governing dietetics, 35 require licensure, 12 require statutory certification, and 1 requires registration. Requirements vary by State. As a result, interested candidates should determine the requirements of the State in which they want to work before sitting for any exam.

In States that require licensure, only people who are licensed can work as dietitians and nutritionists. States that require statutory certification limit the use of occupational titles to people who meet certain requirements; individuals without certification can still practice as a dietitian or nutritionist but without using certain titles. Registration is the least restrictive form of State regulation of dietitians and nutritionists. Unregistered people are permitted to practice as a dietitian or nutritionist.

Certification and other qualifications. Although not required, the Commission on Dietetic Registration of the American Dietetic Association awards the Registered Dietitian credential to those who pass an exam after completing academic coursework and a supervised internship. This certification is different from the statutory certification regulated by some States and discussed in the previous section. To maintain a Registered Dietitian status, workers must complete at least 75 credit hours in approved continuing education classes every 5 years.

A supervised internship, required for certification, can be completed in one of two ways. The first requires the comple-

tion of a program accredited by the Commission on Dietetic Registration. As of 2007, there were 53 accredited programs that combined academic and supervised practice experience and generally lasted 4 to 5 years. The second option requires the completion of 900 hours of supervised practice experience in any of the 265 accredited internships. These internships may be full-time programs lasting 6 to 12 months or part-time programs lasting 2 years.

Advancement. Experienced dietitians may advance to management positions, such as assistant director, associate director, or director of a dietetic department, or may become self-employed. Some dietitians specialize in areas such as renal, diabetic, cardiovascular, or pediatric dietetics. Others leave the occupation to become sales representatives for equipment, pharmaceutical, or food manufacturers. A master's degree can help some workers to advance their careers, particularly in career paths related to research, advanced clinical positions, or public health.

Employment

Dietitians and nutritionists held about 57,000 jobs in 2006. More than half of all jobs were in hospitals, nursing care facilities, outpatient care centers, or offices of physicians and other health practitioners. State and local government agencies provided additional jobs—mostly in correctional facilities, health departments, and other public-health-related areas. Some dietitians and nutritionists were employed in special food services, an industry made up of firms providing food services on contract to facilities such as colleges and universities, airlines, correctional facilities, and company cafeterias.

Other jobs were in public and private educational services, community care facilities for the elderly (which includes assisted-living facilities), individual and family services, home health care services, and the Federal Government—mostly in the U.S. Department of Veterans Affairs. Some dietitians were self-employed, working as consultants to facilities such as hospitals and nursing care facilities or providing dietary counseling to individuals.

Job Outlook

Average employment growth is projected. Good job opportunities are expected, especially for dietitians with specialized training, an advanced degree, or certifications beyond the particular State's minimum requirement.

Employment change. Employment of dietitians and nutritionists is expected to increase 9 percent during the 2006-16 projection decade, about as fast as the average for all occupations. Job growth will result from an increasing emphasis on disease prevention through improved dietary habits. A growing and aging population will boost demand for nutritional counseling and treatment in hospitals, residential care facilities, schools, prisons, community health programs, and home health care agencies. Public interest in nutrition and increased emphasis on health education and prudent lifestyles also will spur demand, especially in food service management.

Employment growth, however, may be constrained if some employers substitute other workers, such as health educators, food service managers, and dietetic technicians, to do work related to nutrition. Also, demand for nutritional therapy services is related to the ability of patients to pay, either out-of-pocket

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Dietitians and nutritionists	29-1031	57,000	62,000	4,900	9

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

or through health insurance, and although more insurance plans now cover nutritional therapy services, the extent of such coverage varies among plans. Growth may be curbed by limitations on insurance reimbursement for dietetic services.

Hospitals will continue to employ a large number of dietitians and nutritionists to provide medical nutritional therapy and plan meals. But hospitals also will continue to contract with outside agencies for food service and move medical nutritional therapy to outpatient care facilities, slowing job growth in hospitals relative to food service, outpatient facilities, and other employers.

The number of dietitian positions in nursing care facilities is expected to decline, as these establishments continue to contract with outside agencies for food services. However, employment is expected to grow rapidly in contract providers of food services, in outpatient care centers, and in offices of physicians and other health practitioners.

Finally, with increased public awareness of obesity and diabetes, Medicare coverage may be expanded to include medical nutrition therapy for renal and diabetic patients, creating job growth for dietitians and nutritionists specializing in those diseases.

Job prospects. In addition to employment growth, job openings will result from the need to replace experienced workers who retire or leave the occupation for other reasons. Overall, job opportunities will be good for dietitians and nutritionists, particularly for licensed and registered dietitians. Job opportunities should be particularly good in outpatient care facilities, offices of physicians, and food service management. Dietitians and nutritionists without a bachelor's degree will face keen competition for jobs.

Dietitians with specialized training, an advanced degree, or certifications beyond the particular State's minimum requirement will experience the best job opportunities. Those specializing in renal and diabetic nutrition or gerontological nutrition will benefit from the growing number of diabetics and the aging of the population.

Earnings

Median annual earnings of dietitians and nutritionists were \$46,980 in May 2006. The middle 50 percent earned between \$38,430 and \$57,090. The lowest 10 percent earned less than \$29,860, and the highest 10 percent earned more than \$68,330. Median annual earnings in the industries employing the largest numbers of dietitians and nutritionists in May 2006 were:

Outpatient care centers.....	\$49,950
General medical and surgical hospitals.....	47,320
State government.....	46,690
Nursing care facilities	46,660
Local government	43,250

According to the American Dietetic Association, median annualized wages for registered dietitians in 2005 varied by practice area as follows: \$53,800 in consultation and business; \$60,000 in food and nutrition management; \$60,200 in education and research; \$48,800 in clinical nutrition/ambulatory care; \$50,000 in clinical nutrition/long-term care; \$44,800 in community nutrition; and \$45,000 in clinical nutrition/acute care. Salaries also vary by years in practice, education level, and geographic region.

Related Occupations

Workers in other occupations who may apply the principles of dietetics include food service managers, health educators, dietetic technicians, and registered nurses.

Sources of Additional Information

For a list of academic programs, scholarships, and other information about dietetics, contact:

➤ The American Dietetic Association, 120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995.

Internet: <http://www.eatright.org>

For information on the Registered Dietitian exam and other specialty credentials, contact:

➤ The Commission on Dietetic Registration, 120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995.

Internet: <http://www.cdrnet.org>

Occupational Therapists

(O*NET 29-1122.00)

Significant Points

- Employment is expected to grow much faster than average and job opportunities should be good, especially for therapists treating the elderly.
- Occupational therapists must be licensed, requiring a master's degree in occupational therapy, 6 months of supervised fieldwork, and passing scores on national and State examinations.
- Occupational therapists are increasingly taking on supervisory roles, allowing assistants and aides to work more closely with clients under the guidance of a therapist.
- More than a quarter of occupational therapists work part time.

Nature of the Work

Occupational therapists help patients improve their ability to perform tasks in living and working environments. They work with individuals who suffer from a mentally, physically, developmentally, or emotionally disabling condition. Occupational therapists use treatments to develop, recover, or maintain the daily living and work skills of their patients. The therapist helps clients not only to improve their basic motor functions and reasoning abilities, but also to compensate for permanent loss of function. The goal is to help clients have independent, productive, and satisfying lives.

Occupational therapists help clients to perform all types of activities, from using a computer to caring for daily needs such as dressing, cooking, and eating. Physical exercises may be used to increase strength and dexterity, while other activities may be chosen to improve visual acuity or the ability to discern patterns. For example, a client with short-term memory loss might be encouraged to make lists to aid recall, and a person with coordination problems might be assigned exercises to improve hand-eye coordination. Occupational therapists also use computer programs to help clients improve decision-making, abstract-reasoning, problem-solving, and perceptual skills, as well as memory, sequencing, and coordination—all of which are important for independent living.

Patients with permanent disabilities, such as spinal cord injuries, cerebral palsy, or muscular dystrophy, often need special instruction to master certain daily tasks. For these individuals, therapists demonstrate the use of adaptive equipment, including wheelchairs, orthoses, eating aids, and dressing aids. They also design or build special equipment needed at home or at work, including computer-aided adaptive equipment. They teach clients how to use the equipment to improve communication and control various situations in their environment.

Some occupational therapists treat individuals whose ability to function in a work environment has been impaired. These practitioners might arrange employment, evaluate the work space, plan work activities, and assess the client's progress. Therapists also may collaborate with the client and the employer to modify the work environment so that the client can successfully complete the work.

Assessing and recording a client's activities and progress is an important part of an occupational therapist's job. Accurate records are essential for evaluating clients, for billing, and for reporting to physicians and other health care providers.

Occupational therapists may work exclusively with individuals in a particular age group or with a particular disability. In schools, for example, they evaluate children's capabilities, recommend and provide therapy, modify classroom equipment, and help children participate in school activities. A therapist may work with children individually, lead small groups in the classroom, consult with a teacher, or serve on an administrative committee. Some therapists provide early intervention therapy to infants and toddlers who have, or are at risk of having, developmental delays. Therapies may include facilitating the use of the hands and promoting skills for listening, following directions, social play, dressing, or grooming.

Other occupational therapists work with elderly patients. These therapists help the elderly lead more productive, active,



Occupational therapists help people improve their ability to perform tasks in their daily living and working environments.

and independent lives through a variety of methods. Therapists with specialized training in driver rehabilitation assess an individual's ability to drive using both clinical and on-the-road tests. The evaluations allow the therapist to make recommendations for adaptive equipment, training to prolong driving independence, and alternative transportation options. Occupational therapists also work with clients to assess their homes for hazards and to identify environmental factors that contribute to falls.

Occupational therapists in mental health settings treat individuals who are mentally ill, developmentally challenged, or emotionally disturbed. To treat these problems, therapists choose activities that help people learn to engage in and cope with daily life. Activities might include time management skills, budgeting, shopping, homemaking, and the use of public transportation. Occupational therapists also work with individuals who are dealing with alcoholism, drug abuse, depression, eating disorders, or stress-related disorders.

Work environment. In large rehabilitation centers, therapists may work in spacious rooms equipped with machines, tools, and other devices generating noise. The work can be tiring because therapists are on their feet much of the time. Those providing home health care services may spend time driving from appointment to appointment. Therapists also face hazards such as back strain from lifting and moving clients and equipment.

Occupational therapists in hospitals and other health care and community settings usually work a 40-hour week. Those in schools may participate in meetings and other activities during and after the school day. In 2006, more than a quarter of occupational therapists worked part time.

Training, Other Qualifications, and Advancement

Occupational therapists must be licensed, requiring a master's degree in occupational therapy, 6 months of supervised fieldwork, and passing scores on national and State examinations.

Education and training. A master’s degree or higher in occupational therapy is the minimum requirement for entry into the field. In 2007, 124 master’s degree programs offered entry-level education, 66 programs offered a combined bachelor’s and master’s degree, and 5 offered an entry-level doctoral degree. Most schools have full-time programs, although a growing number are offering weekend or part-time programs as well. Coursework in occupational therapy programs include the physical, biological, and behavioral sciences as well as the application of occupational therapy theory and skills. Programs also require the completion of 6 months of supervised fieldwork.

People considering this profession should take high school courses in biology, chemistry, physics, health, art, and the social sciences. College admissions offices also look favorably on paid or volunteer experience in the health care field. Relevant undergraduate majors include biology, psychology, sociology, anthropology, liberal arts, and anatomy.

Licensure. All States, Puerto Rico, Guam, and the District of Columbia regulate the practice of occupational therapy. To obtain a license, applicants must graduate from an accredited educational program and pass a national certification examination. Those who pass the exam are awarded the title “Occupational Therapist Registered (OTR).” Some States have additional requirements for therapists who work in schools or early intervention programs. These requirements may include education-related classes, an education practice certificate, or early intervention certification.

Other qualifications. Occupational therapists need patience and strong interpersonal skills to inspire trust and respect in their clients. Patience is necessary because many clients may not show rapid improvement. Ingenuity and imagination in adapting activities to individual needs are assets. Those working in home health care services also must be able to adapt to a variety of settings.

Advancement. Occupational therapists are expected to continue their professional development by participating in continuing education courses and workshops. In fact, a number of States require continuing education as a condition of maintaining licensure.

Therapists are increasingly taking on supervisory roles. Because of rising health care costs, third-party payers are beginning to encourage occupational therapist assistants and aides to take more hands-on responsibility for clients. Occupational therapists can choose to advance their careers by taking on administrative duties and supervising assistants and aides.

Occupational therapists also can advance by specializing in a clinical area and gaining expertise in treating a certain type of patient or ailment. Therapists have specialized in gerontology, mental health, pediatrics, and physical rehabilitation. In addition, some occupational therapists choose to teach classes in accredited occupational therapy educational programs.

Employment

Occupational therapists held about 99,000 jobs in 2006. About 1 in 10 occupational therapists held more than one job. The largest number of jobs was in hospitals. Other major employers were offices of other health practitioners (including offices of occupational therapists), public and private educational services, and nursing care facilities. Some occupational therapists were employed by home health care services, outpatient care centers, offices of physicians, individual and family services, community care facilities for the elderly, and government agencies.

A small number of occupational therapists were self-employed in private practice. These practitioners treated clients referred by other health professionals. They also provided contract or consulting services to nursing care facilities, schools, adult day care programs, and home health care agencies.

Job Outlook

Employment of occupational therapists is expected to grow much faster than the average for all occupations. Job opportunities should be good, especially for occupational therapists treating the elderly.

Employment change. Employment of occupational therapists is expected to increase 23 percent between 2006 and 2016, much faster than the average for all occupations. The increasing elderly population will drive growth in the demand for occupational therapy services. In the short run, the impact of proposed Federal legislation imposing limits on reimbursement for therapy services may adversely affect the job market for occupational therapists. However, over the long run, the demand for occupational therapists should continue to rise as a result of the increasing number of individuals with disabilities or limited function who require therapy services. The baby-boom generation’s movement into middle age, a period when the incidence of heart attack and stroke increases, will spur demand for therapeutic services. Growth in the population 75 years and older—an age group that suffers from high incidences of disabling conditions—also will increase demand for therapeutic services. In addition, medical advances now enable more patients with critical problems to survive—patients who ultimately may need extensive therapy.

Hospitals will continue to employ a large number of occupational therapists to provide therapy services to acutely ill inpatients. Hospitals also will need occupational therapists to staff their outpatient rehabilitation programs.

Employment growth in schools will result from the expansion of the school-age population, the extension of services for disabled students, and an increasing prevalence of sensory disorders in children. Therapists will be needed to help children with disabilities prepare to enter special education programs.

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Occupational therapists.....	29-1122	99,000	122,000	23,000	23

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

Job prospects. Job opportunities should be good for licensed occupational therapists in all settings, particularly in acute hospital, rehabilitation, and orthopedic settings because the elderly receive most of their treatment in these settings. Occupational therapists with specialized knowledge in a treatment area also will have increased job prospects. Driver rehabilitation and fall-prevention training for the elderly are emerging practice areas for occupational therapy.

Earnings

Median annual earnings of occupational therapists were \$60,470 in May 2006. The middle 50 percent earned between \$50,450 and \$73,710. The lowest 10 percent earned less than \$40,840, and the highest 10 percent earned more than \$89,450. Median annual earnings in the industries employing the largest numbers of occupational therapists in May 2006 were:

Home health care services	\$67,600
Nursing care facilities	64,750
Offices of physical, occupational and speech therapists, and audiologists	62,290
General medical and surgical hospitals.....	61,610
Elementary and secondary schools	54,260

Related Occupations

Occupational therapists use specialized knowledge to help individuals perform daily living skills and achieve maximum independence. Other workers performing similar duties include athletic trainers, audiologists, chiropractors, physical therapists, recreational therapists, rehabilitation counselors, respiratory therapists, and speech-language pathologists.

Sources of Additional Information

For more information on occupational therapy as a career, contact:

➤ American Occupational Therapy Association, 4720 Montgomery LaNE., Bethesda, MD 20824-1220.

Internet: <http://www.aota.org>

For information regarding the requirements to practice as an occupational therapist in schools, contact the appropriate occupational therapy regulatory agency for your State.

Optometrists

(O*NET 29-1041.00)

Significant Points

- Admission to optometry school is competitive.
- To be licensed, optometrists must earn a Doctor of Optometry degree from an accredited optometry school and pass the appropriate exams administered by the National Board of Examiners in Optometry.
- Employment is expected to grow as fast as average in response to the vision care needs of a growing and aging population.

Nature of the Work

Optometrists, also known as *doctors of optometry*, or *ODs*, are the main providers of vision care. They examine people’s eyes to diagnose vision problems, such as nearsightedness and farsightedness, and they test patients’ depth and color perception and ability to focus and coordinate the eyes. Optometrists may prescribe eyeglasses or contact lenses, or they may prescribe or provide other treatments, such as vision therapy or low-vision rehabilitation.

Optometrists also test for glaucoma and other eye diseases and diagnose conditions caused by systemic diseases such as diabetes and high blood pressure, referring patients to other health practitioners as needed. They administer drugs to patients to aid in the diagnosis of vision problems and to treat eye diseases. Optometrists often provide preoperative and postoperative care to cataract patients, as well as to patients who have had laser vision correction or other eye surgery.

Most optometrists are in general practice. Some specialize in work with the elderly, children, or partially sighted persons who need specialized visual devices. Others develop and implement ways to protect workers’ eyes from on-the-job strain or injury. Some specialize in contact lenses, sports vision, or vision therapy. A few teach optometry, perform research, or consult.

Most optometrists are private practitioners who also handle the business aspects of running an office, such as developing a patient base, hiring employees, keeping paper and electronic records, and ordering equipment and supplies. Optometrists who operate franchise optical stores also may have some of these duties.

Optometrists should not be confused with ophthalmologists or dispensing opticians. *Ophthalmologists* are physicians who perform eye surgery, as well as diagnose and treat eye diseases and injuries. Like optometrists, they also examine eyes and prescribe eyeglasses and contact lenses. *Dispensing opticians* fit and adjust eyeglasses and, in some States, may fit contact lenses according to prescriptions written by ophthalmologists or optometrists. (See the sections on physicians and surgeons; and opticians, dispensing, elsewhere in the *Handbook*.)

Work environment. Optometrists work in places—usually their own offices—that are clean, well lighted, and comfortable. Most full-time optometrists work about 40 hours a week.



Optometrists use specialized equipment to test vision and detect diseases of the eye.

Many work weekends and evenings to suit the needs of patients. Emergency calls, once uncommon, have increased with the passage of therapeutic-drug laws expanding optometrists' ability to prescribe medications.

Optometrists who work in solo practice or with a partner tend to work longer hours because they must tend to administrative duties in addition to their medical ones. According to the American Optometric Association surveys, optometrists worked about 49 hours per week, on average, in 2004, and were available to see patients about 38 hours per week.

Training, Other Qualifications, and Advancement

The Doctor of Optometry degree requires the completion of a 4-year program at an accredited optometry school, preceded by at least 3 years of preoptometric study at an accredited college or university. All States require optometrists to be licensed.

Education and training. Optometrists need a Doctor of Optometry degree, which requires the completion of a 4-year program at an accredited optometry school. In 2006, there were 16 colleges of optometry in the U.S. and 1 in Puerto Rico that offered programs accredited by the Accreditation Council on Optometric Education of the American Optometric Association. Requirements for admission to optometry schools include college courses in English, mathematics, physics, chemistry, and biology. Because a strong background in science is important, many applicants to optometry school major in a science, such as biology or chemistry as undergraduates. Others major in another subject and take many science courses offering laboratory experience.

Admission to optometry school is competitive. Applicants must take the Optometry Admissions Test, which measures academic ability and scientific comprehension. As a result, most applicants take the test after their sophomore or junior year in college, allowing them an opportunity to take the test again and raise their score. A few applicants are accepted to optometry school after 3 years of college and complete their bachelor's degree while attending optometry school. However, most students accepted by a school or college of optometry have completed an undergraduate degree. Each institution has its own undergraduate prerequisites, so applicants should contact the school or college of their choice for specific requirements.

Optometry programs include classroom and laboratory study of health and visual sciences and clinical training in the diagnosis and treatment of eye disorders. Courses in pharmacology, optics, vision science, biochemistry, and systemic diseases are included.

One-year postgraduate clinical residency programs are available for optometrists who wish to obtain advanced clinical competence. Specialty areas for residency programs include family practice optometry, pediatric optometry, geriatric optometry, vision therapy and rehabilitation, low-vision rehabilitation, cor-

nea and contact lenses, refractive and ocular surgery, primary eye care optometry, and ocular disease.

Licensure. All States and the District of Columbia require that optometrists be licensed. Applicants for a license must have a Doctor of Optometry degree from an accredited optometry school and must pass both a written National Board examination and a National, regional, or State clinical examination. The written and clinical examinations of the National Board of Examiners in Optometry usually are taken during the student's academic career. Many States also require applicants to pass an examination on relevant State laws. Licenses must be renewed every 1 to 3 years and, in all States, continuing education credits are needed for renewal.

Other qualifications. Business ability, self-discipline, and the ability to deal tactfully with patients are important for success. The work of optometrists also requires attention to detail and manual dexterity.

Advancement. Optometrists wishing to teach or conduct research may study for a master's degree or Ph.D. in visual science, physiological optics, neurophysiology, public health, health administration, health information and communication, or health education.

Employment

Optometrists held about 33,000 jobs in 2006. Salaried jobs for optometrists were primarily in offices of optometrists; offices of physicians, including ophthalmologists; and health and personal care stores, including optical goods stores. A few salaried jobs for optometrists were in hospitals, the Federal Government, or outpatient care centers including health maintenance organizations. Nearly 25 percent of optometrists are self-employed. According to a 2005 survey by the American Optometric Association most self-employed optometrists worked in private practice or in partnership with other health care professionals. A small number worked for optical chains or franchises or as independent contractors.

Job Outlook

Employment of optometrists is expected to grow as fast as average for all occupations through 2016, in response to the vision care needs of a growing and aging population. Greater recognition of the importance of vision care, along with growth in employee vision care plans, will also spur job growth.

Employment change. Employment of optometrists is projected to grow 11 percent between 2006 and 2016. A growing population that recognizes the importance of good eye care will increase demand for optometrists. Also, an increasing number of health insurance plans that include vision care, should generate more job growth.

As the population ages, there will likely be more visits to optometrists and ophthalmologists because of the onset of vi-

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Optometrists.....	29-1041	33,000	36,000	3,700	11

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

sion problems that occur at older ages, such as cataracts and glaucoma. In addition, increased incidences of diabetes and hypertension in the general population as well as in the elderly will generate greater demand for optometric services as these diseases often affect eyesight.

Employment of optometrists would grow more rapidly if not for productivity gains expected to allow each optometrist to see more patients. These expected gains stem from greater use of optometric assistants and other support personnel, who can reduce the amount of time optometrists need with each patient.

The increasing popularity of laser surgery to correct some vision problems may reduce some of the demand for optometrists as patients often do not require eyeglasses afterward. But optometrists still will be needed to provide preoperative and postoperative care for laser surgery patients.

Job prospects. Job opportunities for optometrists should be very good over the next decade. Demand is expected to be much higher, and because there are only 16 schools of optometry, the number of students who can get a degree in optometry is limited. In addition to growth, the need to replace optometrists who retire or leave the occupation for other reasons will create more employment opportunities.

Earnings

Median annual earnings of salaried optometrists were \$91,040 in May 2006. The middle 50 percent earned between \$66,530 and \$118,490. Median annual earnings of salaried optometrists in offices of optometrists were \$86,760. Salaried optometrists tend to earn more initially than do optometrists who set up their own practices. In the long run, however, those in private practice usually earn more.

According to the American Optometric Association, median net annual income for all optometrists, including the self-employed, was \$105,000 in 2006. The middle 50 percent earned between \$84,000 and \$150,000.

Self-employed optometrists, including those working in partnerships, must provide their own benefits. Optometrists employed by others typically enjoy paid vacation, sick leave, and pension contributions.

Related Occupations

Other workers who apply scientific knowledge to prevent, diagnose, and treat disorders and injuries are chiropractors, dentists, physicians and surgeons, psychologists, podiatrists, and veterinarians.

Sources of Additional Information

For information on optometry as a career and a list of accredited optometric institutions of education, contact:

➤ Association of Schools and Colleges of Optometry, 6110 Executive Blvd., Suite 510, Rockville, MD 20852.

Internet: <http://www.opted.org>

Additional career information is available from:

➤ American Optometric Association, Educational Services, 243 North Lindbergh Blvd., St. Louis, MO 63141.

Internet: <http://www.aoa.org>

The board of optometry in each State can supply information on licensing requirements.

For information on specific admission requirements and sources of financial aid, contact the admissions officers of individual optometry schools.

Pharmacists

(O*NET 29-1051.00)

Significant Points

- Excellent job opportunities are expected.
- Earnings are high, but some pharmacists are required to work nights, weekends, and holidays.
- Pharmacists are becoming more involved in counseling patients and planning drug therapy programs.
- A license is required; the prospective pharmacist must graduate from an accredited college of pharmacy and pass a series of examinations.

Nature of the Work

Pharmacists distribute prescription drugs to individuals. They also advise their patients, as well as physicians and other health practitioners, on the selection, dosages, interactions, and side effects of medications. Pharmacists monitor the health and progress of patients to ensure the safe and effective use of medication. Compounding—the actual mixing of ingredients to form medications—is a small part of a pharmacist's practice, because most medicines are produced by pharmaceutical companies in a standard dosage and drug delivery form. Most pharmacists work in a community setting, such as a retail drugstore, or in a health care facility, such as a hospital, nursing home, mental health institution, or neighborhood health clinic.

Pharmacists in community pharmacies dispense medications, counsel patients on the use of prescription and over-the-counter medications, and advise physicians about patients' medication therapy. They also advise patients about general health topics such as diet, exercise, and stress management, and provide information on products such as durable medical equipment or home health care supplies. In addition, they may complete third-party insurance forms and other paperwork. Those who own or manage community pharmacies may sell non-health-related merchandise, hire and supervise personnel, and oversee the general operation of the pharmacy. Some community pharmacists provide specialized services to help patients with conditions such as diabetes, asthma, smoking cessation, or high blood pressure; others also are trained to administer vaccinations.

Pharmacists in health care facilities dispense medications and advise the medical staff on the selection and effects of drugs. They may make sterile solutions to be administered intravenously. They also plan, monitor and evaluate drug programs or regimens. They may counsel hospitalized patients on the use of drugs before the patients are discharged.

Pharmacists who work in home health care monitor drug therapy and prepare infusions—solutions that are injected into patients—and other medications for use in the home.

Some pharmacists specialize in specific drug therapy areas, such as intravenous nutrition support, oncology (cancer), nuclear pharmacy (used for chemotherapy), geriatric pharmacy, and psychiatric pharmacy (the use of drugs to treat mental disorders).

Most pharmacists keep confidential computerized records of patients' drug therapies to prevent harmful drug interactions. Pharmacists are responsible for the accuracy of every prescription that is filled, but they often rely upon pharmacy technicians and pharmacy aides to assist them in the dispensing process. Thus, the pharmacist may delegate prescription-filling and administrative tasks and supervise their completion. Pharmacists also frequently oversee pharmacy students serving as interns.

Increasingly, pharmacists are pursuing nontraditional pharmacy work. Some are involved in research for pharmaceutical manufacturers, developing new drugs and testing their effects. Others work in marketing or sales, providing clients with expertise on the use, effectiveness, and possible side effects of drugs. Some pharmacists work for health insurance companies, developing pharmacy benefit packages and carrying out cost-benefit analyses on certain drugs. Other pharmacists work for the government, managed care organizations, public health care services, the armed services, or pharmacy associations. Finally, some pharmacists are employed full time or part time as college faculty, teaching classes and performing research in a wide range of areas.

Work environment. Pharmacists work in clean, well-lit, and well-ventilated areas. Many pharmacists spend most of their workday on their feet. When working with sterile or dangerous pharmaceutical products, pharmacists wear gloves, masks, and other protective equipment.

Most full-time salaried pharmacists work approximately 40 hours a week, and about 10 percent work more than 50 hours. Many community and hospital pharmacies are open for extended hours or around the clock, so pharmacists may be required to work nights, weekends, and holidays. Consultant pharmacists may travel to nursing homes or other facilities to monitor patients' drug therapy. About 16 percent of pharmacists worked part time in 2006.



Pharmacists counsel patients and answer questions about medications.

Training, Other Qualifications, and Advancement

A license is required in all States, the District of Columbia, and all U.S. territories. In order to obtain a license, pharmacists must earn a Doctor of Pharmacy (Pharm.D.) degree from a college of pharmacy and pass several examinations.

Education and training. Pharmacists must earn a Pharm.D. degree from an accredited college or school of pharmacy. The Pharm.D. degree has replaced the Bachelor of Pharmacy degree, which is no longer being awarded. To be admitted to a Pharm.D. program, an applicant must have completed at least 2 years of postsecondary study, although most applicants have completed 3 or more years. Other entry requirements usually include courses in mathematics and natural sciences, such as chemistry, biology, and physics, as well as courses in the humanities and social sciences. In 2007, 92 colleges and schools of pharmacy were accredited to confer degrees by the Accreditation Council for Pharmacy Education (ACPE). About 70 percent of Pharm.D. programs require applicants to take the Pharmacy College Admissions Test (PCAT).

Courses offered at colleges of pharmacy are designed to teach students about all aspects of drug therapy. In addition, students learn how to communicate with patients and other health care providers about drug information and patient care. Students also learn professional ethics, concepts of public health, and medication distribution systems management. In addition to receiving classroom instruction, students in Pharm.D. programs spend about one-fourth of their time in a variety of pharmacy practice settings under the supervision of licensed pharmacists.

In the 2006–07 academic year, 70 colleges of pharmacy also awarded the master-of-science degree or the Ph.D. degree. Both degrees are awarded after the completion of a Pharm.D. degree and are designed for those who want additional clinical, laboratory, and research experience. Areas of graduate study include pharmaceuticals and pharmaceutical chemistry (physical and chemical properties of drugs and dosage forms), pharmacology (effects of drugs on the body), and pharmacy administration. Many master's and Ph.D. degree holders go on to do research for a drug company or teach at a university.

Other options for pharmacy graduates who are interested in further training include 1-year or 2-year residency programs or fellowships. Pharmacy residencies are postgraduate training programs in pharmacy practice and usually require the completion of a research project. These programs are often mandatory for pharmacists who wish to work in hospitals. Pharmacy fellowships are highly individualized programs that are designed to prepare participants to work in a specialized area of pharmacy, such as clinical practice or research laboratories. Some pharmacists who own their own pharmacy obtain a master's degree in business administration (MBA). Others may obtain a degree in public administration or public health.

Licensure. A license to practice pharmacy is required in all States, the District of Columbia, and all U.S. territories. To obtain a license, a prospective pharmacist must graduate from a college of pharmacy that is accredited by the ACPE and pass a series of examinations. All States, U.S. territories, and the District of Columbia require the North American Pharmacist Licensure Exam (NAPLEX), which tests pharmacy skills and knowledge. Forty-four States and the District of Columbia also

require the Multistate Pharmacy Jurisprudence Exam (MPJE), which tests pharmacy law. Both exams are administered by the National Association of Boards of Pharmacy (NABP). Each of the eight States and territories that do not require the MJPE has its own pharmacy law exam. In addition to the NAPLEX and MPJE, some States and territories require additional exams that are unique to their jurisdiction.

All jurisdictions except California currently grant license transfers to qualified pharmacists who already are licensed by another jurisdiction. Many pharmacists are licensed to practice in more than one jurisdiction. Most jurisdictions require continuing education for license renewal. Persons interested in a career as a pharmacist should check with individual jurisdiction boards of pharmacy for details on license renewal requirements and license transfer procedures.

Graduates of foreign pharmacy schools may also qualify for licensure in some U.S. States and territories. These individuals must apply for certification from the Foreign Pharmacy Graduate Examination Committee (FPGEC). Once certified, they must pass the Foreign Pharmacy Graduate Equivalency Examination (FPGEE), Test of English as a Foreign Language (TOEFL) exam, and Test of Spoken English (TSE) exam. They then must pass all of the exams required by the licensing jurisdiction, such as the NAPLEX and MJPE. Applicants who graduated from programs accredited by the Canadian Council for Accreditation of Pharmacy Programs (CCAPP) between 1993 and 2004 are exempt from FPGEC certification and examination requirements.

Other qualifications. Prospective pharmacists should have scientific aptitude, good interpersonal skills, and a desire to help others. They also must be conscientious and pay close attention to detail, because the decisions they make affect human lives.

Advancement. In community pharmacies, pharmacists usually begin at the staff level. Pharmacists in chain drugstores may be promoted to pharmacy supervisor or manager at the store level, then to manager at the district or regional level, and later to an executive position within the chain’s headquarters. Hospital pharmacists may advance to supervisory or administrative positions. After they gain experience and secure the necessary capital, some pharmacists become owners or part owners of independent pharmacies. Pharmacists in the pharmaceutical industry may advance in marketing, sales, research, quality control, production, or other areas.

Employment

Pharmacists held about 243,000 jobs in 2006. About 62 percent worked in community pharmacies that were either independently owned or part of a drugstore chain, grocery store, department store, or mass merchandiser. Most community pharmacists were salaried employees, but some were self-employed owners. About 23 percent of pharmacists worked in hospitals. A small proportion

worked in mail-order and Internet pharmacies, pharmaceutical wholesalers, offices of physicians, and the Federal Government.

Job Outlook

Employment is expected to increase much faster than the average through 2016. As a result of rapid growth and the need to replace workers who leave the occupation, job prospects should be excellent.

Employment change. Employment of pharmacists is expected to grow by 22 percent between 2006 and 2016, which is much faster than the average for all occupations. The increasing numbers of middle-aged and elderly people—who use more prescription drugs than younger people—will continue to spur demand for pharmacists throughout the projection period. Other factors likely to increase the demand for pharmacists include scientific advances that will make more drug products available and the coverage of prescription drugs by a greater number of health insurance plans and Medicare.

As the use of prescription drugs increases, demand for pharmacists will grow in most practice settings, such as community pharmacies, hospital pharmacies, and mail-order pharmacies. As the population ages, assisted living facilities and home care organizations should see particularly rapid growth. Demand will also increase as cost conscious insurers, in an attempt to improve preventative care, use pharmacists in areas such as patient education and vaccination administration.

Demand is also increasing in managed care organizations where pharmacists analyze trends and patterns in medication use, and in pharmacoeconomics—the cost and benefit analysis of different drug therapies. New jobs also are being created in disease management—the development of new methods for curing and controlling diseases—and in sales and marketing. Rapid growth is also expected in pharmacy informatics—the use of information technology to improve patient care.

Job prospects. Excellent opportunities are expected for pharmacists over the 2006 to 2016 period. Job openings will result from rapid employment growth, and from the need to replace workers who retire or leave the occupation for other reasons.

Earnings

Median annual of wage-and-salary pharmacists in May 2006 were \$94,520. The middle 50 percent earned between \$83,180 and \$108,140 a year. The lowest 10 percent earned less than \$67,860, and the highest 10 percent earned more than \$119,480 a year. Median annual earnings in the industries employing the largest numbers of pharmacists in May 2006 were:

Department stores	\$99,050
Grocery stores	95,600
Pharmacies and drug stores.....	94,640
General medical and surgical hospitals.....	93,640

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Pharmacists	29-1051	243,000	296,000	53,000	22

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

According to a 2006 survey by *Drug Topics Magazine*, pharmacists in retail settings earned an average of \$92,291 per year, while pharmacists in institutional settings earned an average of \$97,545. Full-time pharmacists earned an average of \$102,336, while part-time pharmacists earned an average of \$55,589.

Related Occupations

Pharmacy technicians and pharmacy aides also work in pharmacies. Persons in other professions who may work with pharmaceutical compounds include biological scientists, medical scientists, and chemists and materials scientists. Increasingly, pharmacists are involved in patient care and therapy, work that they have in common with physicians and surgeons.

Sources of Additional Information

For information on pharmacy as a career, preprofessional and professional requirements, programs offered by colleges of pharmacy, and student financial aid, contact:

► American Association of Colleges of Pharmacy, 1426 Prince St., Alexandria, VA 22314. Internet: <http://www.aacp.org>

General information on careers in pharmacy is available from:

► American Society of Health-System Pharmacists, 7272 Wisconsin Ave., Bethesda, MD 20814. Internet: <http://www.ashp.org>

► National Association of Chain Drug Stores, 413 N. Lee St., P.O. Box 1417-D49, Alexandria, VA 22313-1480.

Internet: <http://www.nacds.org>

► Academy of Managed Care Pharmacy, 100 North Pitt St., Suite 400, Alexandria, VA 22314. Internet: <http://www.amcp.org>

► American Pharmacists Association, 1100 15th Street, NW, Suite 400., Washington, DC 20005. Internet: <http://www.aphanet.org>

Information on the North American Pharmacist Licensure Exam (NAPLEX) and the Multistate Pharmacy Jurisprudence Exam (MPJE) is available from:

► National Association of Boards of Pharmacy, 1600 Feehanville Dr., Mount Prospect, IL 60056. Internet: <http://www.nabp.net>

State licensure requirements are available from each State's board of pharmacy. Information on specific college entrance requirements, curriculums, and financial aid is available from any college of pharmacy.

Physical Therapists

(O*NET 29-1123.00)

Significant Points

- Employment is expected to increase much faster than average.
- Job opportunities should be good, particularly in acute hospital, rehabilitation, and orthopedic settings.
- Physical therapists need a master's degree from an accredited physical therapy program and a State license, requiring passing scores on national and State examinations.
- About 6 out of 10 physical therapists work in hospitals or in offices of physical therapists.



Physical therapists use traction or deep-tissue massage to relieve pain.

Nature of the Work

Physical therapists provide services that help restore function, improve mobility, relieve pain, and prevent or limit permanent physical disabilities of patients suffering from injuries or disease. They restore, maintain, and promote overall fitness and health. Their patients include accident victims and individuals with disabling conditions such as low-back pain, arthritis, heart disease, fractures, head injuries, and cerebral palsy.

Therapists examine patients' medical histories and then test and measure the patients' strength, range of motion, balance and coordination, posture, muscle performance, respiration, and motor function. Next, physical therapists develop plans describing a treatment strategy and its anticipated outcome.

Treatment often includes exercise, especially for patients who have been immobilized or who lack flexibility, strength, or endurance. Physical therapists encourage patients to use their muscles to increase their flexibility and range of motion. More advanced exercises focus on improving strength, balance, coordination, and endurance. The goal is to improve how an individual functions at work and at home.

Physical therapists also use electrical stimulation, hot packs or cold compresses, and ultrasound to relieve pain and reduce swelling. They may use traction or deep-tissue massage to relieve pain and improve circulation and flexibility. Therapists also teach patients to use assistive and adaptive devices, such as crutches, prostheses, and wheelchairs. They also may show patients how to do exercises at home to expedite their recovery.

As treatment continues, physical therapists document the patient's progress, conduct periodic examinations, and modify treatments when necessary.

Physical therapists often consult and practice with a variety of other professionals, such as physicians, dentists, nurses, educators, social workers, occupational therapists, speech-language pathologists, and audiologists.

Some physical therapists treat a wide range of ailments; others specialize in areas such as pediatrics, geriatrics, orthopedics, sports medicine, neurology, and cardiopulmonary physical therapy.

Work environment. Physical therapists practice in hospitals, clinics, and private offices that have specially equipped facilities. They also treat patients in hospital rooms, homes, or schools. These jobs can be physically demanding because therapists often have to stoop, kneel, crouch, lift, and stand for long periods. In addition, physical therapists move heavy equipment and lift patients or help them turn, stand, or walk.

In 2006, most full-time physical therapists worked a 40-hour week; some worked evenings and weekends to fit their patients' schedules. About 1 in 5 physical therapists worked part time.

Training, Other Qualifications, and Advancement

Physical therapists need a master's degree from an accredited physical therapy program and a State license, requiring passing scores on national and State examinations.

Education and training. According to the American Physical Therapy Association, there were 209 accredited physical therapist education programs in 2007. Of the accredited programs, 43 offered master's degrees and 166 offered doctoral degrees. Only master's degree and doctoral degree programs are accredited, in accordance with the Commission on Accreditation in Physical Therapy Education. In the future, a doctoral degree might be the required entry-level degree. Master's degree programs typically last 2 years, and doctoral degree programs last 3 years.

Physical therapist education programs start with basic science courses such as biology, chemistry, and physics and then introduce specialized courses, including biomechanics, neuroanatomy, human growth and development, manifestations of disease, examination techniques, and therapeutic procedures. Besides getting classroom and laboratory instruction, students receive supervised clinical experience.

Among the undergraduate courses that are useful when one applies to a physical therapist education program are anatomy, biology, chemistry, social science, mathematics, and physics. Before granting admission, many programs require volunteer experience in the physical therapy department of a hospital or clinic. For high school students, volunteering with the school athletic trainer is a good way to gain experience.

Licensure. All States require physical therapists to pass national and State licensure exams before they can practice. They must also graduate from an accredited physical therapist education program.

Other qualifications. Physical therapists should have strong interpersonal skills so that they can educate patients about their physical therapy treatments and communicate with patients' families. Physical therapists also should be compassionate and possess a desire to help patients.

Advancement. Physical therapists are expected to continue their professional development by participating in continuing education

courses and workshops. In fact, a number of States require continuing education as a condition of maintaining licensure.

Employment

Physical therapists held about 173,000 jobs in 2006. The number of jobs is greater than the number of practicing physical therapists because some physical therapists hold two or more jobs. For example, some may work in a private practice, but also work part time in another health care facility.

About 6 out of 10 physical therapists worked in hospitals or in offices of physical therapists. Other jobs were in the home health care services industry, nursing care facilities, outpatient care centers, and offices of physicians. Some physical therapists were self-employed in private practices, seeing individual patients and contracting to provide services in hospitals, rehabilitation centers, nursing care facilities, home health care agencies, adult day care programs, and schools. Physical therapists also teach in academic institutions and conduct research.

Job Outlook

Employment of physical therapists is expected to grow much faster than average. Job opportunities will be good, especially in acute hospital, rehabilitation, and orthopedic settings.

Employment change. Employment of physical therapists is expected to grow 27 percent from 2006 to 2016, much faster than the average for all occupations. The impact of proposed Federal legislation imposing limits on reimbursement for therapy services may adversely affect the short-term job outlook for physical therapists. However, the long-run demand for physical therapists should continue to rise as new treatments and techniques expand the scope of physical therapy practices. Moreover, demand will be spurred by the increasing numbers of individuals with disabilities or limited function.

The increasing elderly population will drive growth in the demand for physical therapy services. The elderly population is particularly vulnerable to chronic and debilitating conditions that require therapeutic services. Also, the baby-boom generation is entering the prime age for heart attacks and strokes, increasing the demand for cardiac and physical rehabilitation. And increasing numbers of children will need physical therapy as technological advances save the lives of a larger proportion of newborns with severe birth defects.

Future medical developments also should permit a higher percentage of trauma victims to survive, creating additional demand for rehabilitative care. In addition, growth may result from advances in medical technology that could permit the treatment of an increasing number of disabling conditions that were untreatable in the past.

Widespread interest in health promotion also should increase demand for physical therapy services. A growing number of em-

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Physical therapists.....	29-1123	173,000	220,000	47,000	27

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

ployers are using physical therapists to evaluate worksites, develop exercise programs, and teach safe work habits to employees.

Job prospects. Job opportunities will be good for licensed physical therapists in all settings. Job opportunities should be particularly good in acute hospital, rehabilitation, and orthopedic settings, where the elderly are most often treated. Physical therapists with specialized knowledge of particular types of treatment also will have excellent job prospects.

Earnings

Median annual earnings of physical therapists were \$66,200 in May 2006. The middle 50 percent earned between \$55,030 and \$78,080. The lowest 10 percent earned less than \$46,510, and the highest 10 percent earned more than \$94,810. Median annual earnings in the industries employing the largest numbers of physical therapists in May 2006 were:

Home health care services	\$70,920
Nursing care facilities	68,650
General medical and surgical hospitals.....	66,630
Offices of physicians.....	65,900
Offices of physical, occupational and speech therapists, and audiologists	65,150

Related Occupations

Physical therapists rehabilitate people with physical disabilities. Others who work in the rehabilitation field include audiologists, chiropractors, occupational therapists, recreational therapists, rehabilitation counselors, respiratory therapists, and speech-language pathologists.

Sources of Additional Information

Additional career information and a list of accredited educational programs in physical therapy are available from:

► American Physical Therapy Association, 1111 North Fairfax St, Alexandria, VA 22314-1488.

Internet: <http://www.apta.org>

Physician Assistants

(O*NET 29-1071.00)

Significant Points

- Physician assistant programs usually last at least 2 years; admission requirements vary by program, but many require at least 2 years of college and some health care experience.
- All States require physician assistants to complete an accredited education program and to pass a national exam in order to obtain a license.
- Employment is projected to grow much faster than average as health care establishments increasingly use physician assistants to contain costs.
- Job opportunities should be good, particularly in rural and inner-city clinics.



Physician assistants may be the principal care providers in rural or inner city clinics, where a physician is present for only one or two days each week.

Nature of the Work

Physician assistants (PAs) practice medicine under the supervision of physicians and surgeons. They should not be confused with medical assistants, who perform routine clinical and clerical tasks. (Medical assistants are discussed elsewhere in the *Handbook*.) PAs are formally trained to provide diagnostic, therapeutic, and preventive health care services, as delegated by a physician. Working as members of the health care team, they take medical histories, examine and treat patients, order and interpret laboratory tests and x-rays, and make diagnoses. They also treat minor injuries, by suturing, splinting, and casting. PAs record progress notes, instruct and counsel patients, and order or carry out therapy. In 48 States and the District of Columbia, physician assistants may prescribe some medications. In some establishments, a PA is responsible for managerial duties, such as ordering medical supplies or equipment and supervising technicians and assistants.

Physician assistants work under the supervision of a physician. However, PAs may be the principal care providers in rural or inner city clinics where a physician is present for only one or two days each week. In such cases, the PA confers with the supervising physician and other medical professionals as needed and as required by law. PAs also may make house calls or go to hospitals and nursing care facilities to check on patients, after which they report back to the physician.

The duties of physician assistants are determined by the supervising physician and by State law. Aspiring PAs should investigate the laws and regulations in the States in which they wish to practice.

Many PAs work in primary care specialties, such as general internal medicine, pediatrics, and family medicine. Other specialty areas include general and thoracic surgery, emergency medicine, orthopedics, and geriatrics. PAs specializing in sur-

gery provide preoperative and postoperative care and may work as first or second assistants during major surgery.

Work environment. Although PAs usually work in a comfortable, well-lighted environment, those in surgery often stand for long periods. At times, the job requires a considerable amount of walking. Schedules vary according to the practice setting, and often depend on the hours of the supervising physician. The workweek of hospital-based PAs may include weekends, nights, or early morning hospital rounds to visit patients. These workers also may be on call. PAs in clinics usually work a 40-hour week.

Training, Other Qualifications, and Advancement

Physician assistant programs usually last at least 2 years. Admission requirements vary by program, but many require at least 2 years of college and some health care experience. All States require that PAs complete an accredited, formal education program and pass a National exam to obtain a license.

Education and training. Physician assistant education programs usually last at least 2 years and are full time. Most programs are in schools of allied health, academic health centers, medical schools, or 4-year colleges; a few are in community colleges, the military, or hospitals. Many accredited PA programs have clinical teaching affiliations with medical schools.

In 2007, 136 education programs for physician assistants were accredited or provisionally accredited by the American Academy of Physician Assistants. More than 90 of these programs offered the option of a master’s degree, and the rest offered either a bachelor’s degree or an associate degree. Most applicants to PA educational programs already have a bachelor’s degree.

Admission requirements vary, but many programs require 2 years of college and some work experience in the health care field. Students should take courses in biology, English, chemistry, mathematics, psychology, and the social sciences. Many PAs have prior experience as registered nurses, and others come from varied backgrounds, including military corpsman or medics and allied health occupations such as respiratory therapists, physical therapists, and emergency medical technicians and paramedics.

PA education includes classroom instruction in biochemistry, pathology, human anatomy, physiology, microbiology, clinical pharmacology, clinical medicine, geriatric and home health care, disease prevention, and medical ethics. Students obtain supervised clinical training in several areas, including family medicine, internal medicine, surgery, prenatal care and gynecology, geriatrics, emergency medicine, psychiatry, and pediatrics. Sometimes, PA students serve one or more of these rotations under the supervision of a physician who is seeking to hire a PA. The rotations often lead to permanent employment.

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Physician assistants.....	29-1071	66,000	83,000	18,000	27

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

Licensure. All States and the District of Columbia have legislation governing the qualifications or practice of physician assistants. All jurisdictions require physician assistants to pass the Physician Assistant National Certifying Examination, administered by the National Commission on Certification of Physician Assistants (NCCPA) and open only to graduates of accredited PA education programs. Only those successfully completing the examination may use the credential “Physician Assistant-Certified.” To remain certified, PAs must complete 100 hours of continuing medical education every 2 years. Every 6 years, they must pass a recertification examination or complete an alternative program combining learning experiences and a take-home examination.

Other qualifications. Physician assistants must have a desire to serve patients and be self-motivated. PAs also must have a good bedside manner, emotional stability, and the ability to make decisions in emergencies. Physician assistants must be willing to study throughout their career to keep up with medical advances.

Certification and advancement. Some PAs pursue additional education in a specialty such as surgery, neonatology, or emergency medicine. PA postgraduate educational programs are available in areas such as internal medicine, rural primary care, emergency medicine, surgery, pediatrics, neonatology, and occupational medicine. Candidates must be graduates of an accredited program and be certified by the NCCPA.

As they attain greater clinical knowledge and experience, PAs can advance to added responsibilities and higher earnings. However, by the very nature of the profession, clinically practicing PAs always are supervised by physicians.

Employment

Physician assistants held about 66,000 jobs in 2006. The number of jobs is greater than the number of practicing PAs because some hold two or more jobs. For example, some PAs work with a supervising physician, but also work in another practice, clinic, or hospital. According to the American Academy of Physician Assistants, about 15 percent of actively practicing PAs worked in more than one clinical job concurrently in 2006.

More than half of jobs for PAs were in the offices of physicians. About a quarter were in hospitals, public or private. The rest were mostly in outpatient care centers, including health maintenance organizations; the Federal Government; and public or private colleges, universities, and professional schools. A few were self-employed.

Job Outlook

Employment is expected to grow much faster than the average as health care establishments increasingly use physician assistants to contain costs. Job opportunities for PAs should be

good, particularly in rural and inner city clinics, as these settings typically have difficulty attracting physicians.

Employment change. Employment of physician assistants is expected to grow 27 percent from 2006 to 2016, much faster than the average for all occupations. Projected rapid job growth reflects the expansion of health care industries and an emphasis on cost containment, which results in increasing use of PAs by health care establishments.

Physicians and institutions are expected to employ more PAs to provide primary care and to assist with medical and surgical procedures because PAs are cost-effective and productive members of the health care team. Physician assistants can relieve physicians of routine duties and procedures. Telemedicine—using technology to facilitate interactive consultations between physicians and physician assistants—also will expand the use of physician assistants.

Besides working in traditional office-based settings, PAs should find a growing number of jobs in institutional settings such as hospitals, academic medical centers, public clinics, and prisons. PAs also may be needed to augment medical staffing in inpatient teaching hospital settings as the number of hours physician residents are permitted to work is reduced, encouraging hospitals to use PAs to supply some physician resident services.

Job prospects. Job opportunities for PAs should be good, particularly in rural and inner-city clinics because those settings have difficulty attracting physicians. In addition to job openings from employment growth, openings will result from the need to replace physician assistants who retire or leave the occupation permanently during the 2006-16 decade. Opportunities will be best in States that allow PAs a wider scope of practice, such as allowing PAs to prescribe medications.

Earnings

Median annual earnings of wage-and-salary physician assistants were \$74,980 in May 2006. The middle 50 percent earned between \$62,430 and \$89,220. The lowest 10 percent earned less than \$43,100, and the highest 10 percent earned more than \$102,230. Median annual earnings in the industries employing the largest numbers of physician assistants in May 2006 were:

Outpatient care centers.....	\$80,960
General medical and surgical hospitals.....	76,710
Offices of physicians.....	74,160

According to the American Academy of Physician Assistants, median income for physician assistants in full-time clinical practice was \$80,356 in 2006; median income for first-year graduates was \$69,517. Income varies by specialty, practice setting, geographical location, and years of experience. Employers often pay for their employees' liability insurance, registration fees with the Drug Enforcement Administration, State licensing fees, and credentialing fees.

Related Occupations

Other health care workers who provide direct patient care that requires a similar level of skill and training include audiologists,

occupational therapists, physical therapists, registered nurses, and speech-language pathologists.

Sources of Additional Information

For information on a career as a physician assistant, including a list of accredited programs, contact:

➤ American Academy of Physician Assistants Information Center, 950 North Washington St., Alexandria, VA 22314. Internet: <http://www.aapa.org>

For eligibility requirements and a description of the Physician Assistant National Certifying Examination, contact:

➤ National Commission on Certification of Physician Assistants, Inc., 12000 Findley Rd., Suite 200, Duluth, GA 30097. Internet: <http://www.nccpa.net>

Physicians and Surgeons

(O*NET 29-1061.00, 29-1062.00, 29-1063.00, 29-1064.00, 29-1065.00, 29-1066.00, 29-1067.00, 29-1069.99)

Significant Points

- Many physicians and surgeons work long, irregular hours; more than one-third of full-time physicians worked 60 hours or more a week in 2006.
- Acceptance to medical school is highly competitive.
- Formal education and training requirements are among the most demanding of any occupation, but earnings are among the highest.
- Job opportunities should be very good, particularly in rural and low-income areas.

Nature of the Work

Physicians and surgeons diagnose illnesses and prescribe and administer treatment for people suffering from injury or disease. Physicians examine patients, obtain medical histories, and order, perform, and interpret diagnostic tests. They counsel patients on diet, hygiene, and preventive health care.

There are two types of physicians: M.D.—Doctor of Medicine—and D.O.—Doctor of Osteopathic Medicine. M.D.s also are known as allopathic physicians. While both M.D.s and D.O.s may use all accepted methods of treatment, including drugs and surgery, D.O.s place special emphasis on the body's musculoskeletal system, preventive medicine, and holistic patient care. D.O.s are most likely to be primary care specialists although they can be found in all specialties. About half of D.O.s practice general or family medicine, general internal medicine, or general pediatrics.

Physicians work in one or more of several specialties, including, but not limited to, anesthesiology, family and general medicine, general internal medicine, general pediatrics, obstetrics and gynecology, psychiatry, and surgery.

Anesthesiologists focus on the care of surgical patients and pain relief. Like other physicians, they evaluate and treat patients and direct the efforts of their staffs. Through continual monitoring and assessment, these critical care specialists are

responsible for maintenance of the patient's vital life functions—heart rate, body temperature, blood pressure, breathing—during surgery. They also work outside of the operating room, providing pain relief in the intensive care unit, during labor and delivery, and for those who suffer from chronic pain. Anesthesiologists confer with other physicians and surgeons about appropriate treatments and procedures before, during, and after operations.

Family and general practitioners often provide the first point of contact for people seeking health care, by acting as the traditional family doctor. They assess and treat a wide range of conditions, from sinus and respiratory infections to broken bones. Family and general practitioners typically have a base of regular, long-term patients. These doctors refer patients with more serious conditions to specialists or other health care facilities for more intensive care.

General internists diagnose and provide nonsurgical treatment for a wide range of problems that affect internal organ systems, such as the stomach, kidneys, liver, and digestive tract. Internists use a variety of diagnostic techniques to treat patients through medication or hospitalization. Like general practitioners, general internists commonly act as primary care specialists. They treat patients referred from other specialists, and, in turn they refer patients to other specialists when more complex care is required.

General pediatricians care for the health of infants, children, teenagers, and young adults. They specialize in the diagnosis and treatment of a variety of ailments specific to young people and track patients' growth to adulthood. Like most physicians, pediatricians work with different health care workers, such as nurses and other physicians, to assess and treat children with various ailments. Most of the work of pediatricians involves treating day-to-day illnesses—minor injuries, infectious diseases, and immunizations—that are common to children, much as a general practitioner treats adults. Some pediatricians specialize in pediatric surgery or serious medical conditions, such as autoimmune disorders or serious chronic ailments.

Obstetricians and gynecologists (OB/GYNs) specialize in women's health. They are responsible for women's general medical care, and they also provide care related to pregnancy and the reproductive system. Like general practitioners, OB/GYNs attempt to prevent, diagnose, and treat general health problems, but they focus on ailments specific to the female anatomy, such as cancers of the breast or cervix, urinary tract and pelvic disorders, and hormonal disorders. OB/GYNs also specialize in childbirth, treating and counseling women throughout their pregnancy, from giving prenatal diagnoses to assisting with delivery and providing postpartum care.

Psychiatrists are the primary caregivers in the area of mental health. They assess and treat mental illnesses through a combination of psychotherapy, psychoanalysis, hospitalization, and medication. Psychotherapy involves regular discussions with patients about their problems; the psychiatrist helps them find solutions through changes in their behavioral patterns, the exploration of their past experiences, or group and family therapy sessions. Psychoanalysis involves long-term psychotherapy and counseling for patients. In many cases,

medications are administered to correct chemical imbalances that cause emotional problems. Psychiatrists also may administer electroconvulsive therapy to those of their patients who do not respond to, or who cannot take, medications.

Surgeons specialize in the treatment of injury, disease, and deformity through operations. Using a variety of instruments, and with patients under anesthesia, a surgeon corrects physical deformities, repairs bone and tissue after injuries, or performs preventive surgeries on patients with debilitating diseases or disorders. Although a large number perform general surgery, many surgeons choose to specialize in a specific area. One of the most prevalent specialties is orthopedic surgery: the treatment of the musculoskeletal system. Others include neurological surgery (treatment of the brain and nervous system), cardiovascular surgery, otolaryngology (treatment of the ear, nose, and throat), and plastic or reconstructive surgery. Like other physicians, surgeons also examine patients, perform and interpret diagnostic tests, and counsel patients on preventive health care.

Other physicians and surgeons work in a number of other medical and surgical specialists, including allergists, cardiologists, dermatologists, emergency physicians, gastroenterologists, ophthalmologists, pathologists, and radiologists.

Work environment. Many physicians—primarily general and family practitioners, general internists, pediatricians, OB/GYNs, and psychiatrists—work in small private offices or clinics, often assisted by a small staff of nurses and other administrative personnel. Increasingly, physicians are practicing in groups or health care organizations that provide backup coverage and allow for more time off. Physicians in a group practice or health care organization often work as part of a team that coordinates care for a number of patients; they are less independent than the solo practitioners of the past. Surgeons and anesthesiologists usually work in well-lit, sterile environments while performing surgery and often stand for long periods. Most work in hospitals or in surgical outpatient centers.

Many physicians and surgeons work long, irregular hours. Over one-third of full-time physicians and surgeons worked 60 hours or more a week in 2006. Only 8 percent of all phy-



Physicians increasingly practice in groups or health care organizations that provide backup coverage and allow for more time off.

sicians and surgeons worked part-time, compared with 15 percent for all occupations. Physicians and surgeons must travel frequently between office and hospital to care for their patients. While on call, a physician will deal with many patients' concerns over the phone and make emergency visits to hospitals or nursing homes.

Training, Other Qualifications, and Advancement

The common path to practicing as a physician requires 8 years of education beyond high school and 3 to 8 additional years of internship and residency. All States, the District of Columbia, and U.S. territories license physicians.

Education and training. Formal education and training requirements for physicians are among the most demanding of any occupation—4 years of undergraduate school, 4 years of medical school, and 3 to 8 years of internship and residency, depending on the specialty selected. A few medical schools offer combined undergraduate and medical school programs that last 6 years rather than the customary 8 years.

Premedical students must complete undergraduate work in physics, biology, mathematics, English, and inorganic and organic chemistry. Students also take courses in the humanities and the social sciences. Some students volunteer at local hospitals or clinics to gain practical experience in the health professions.

The minimum educational requirement for entry into medical school is 3 years of college; most applicants, however, have at least a bachelor's degree, and many have advanced degrees. There are 146 medical schools in the United States—126 teach allopathic medicine and award a Doctor of Medicine (M.D.) degree; 20 teach osteopathic medicine and award the Doctor of Osteopathic Medicine (D.O.) degree.

Acceptance to medical school is highly competitive. Applicants must submit transcripts, scores from the Medical College Admission Test, and letters of recommendation. Schools also consider an applicant's character, personality, leadership qualities, and participation in extracurricular activities. Most schools require an interview with members of the admissions committee.

Students spend most of the first 2 years of medical school in laboratories and classrooms, taking courses such as anatomy, biochemistry, physiology, pharmacology, psychology, microbiology, pathology, medical ethics, and laws governing medicine. They also learn to take medical histories, examine patients, and diagnose illnesses. During their last 2 years, students work with patients under the supervision of experienced physicians in hospitals and clinics, learning acute, chronic, preventive, and rehabilitative care. Through rotations in internal medicine, family practice, obstetrics and gynecology, pediatrics, psychiatry, and surgery, they gain experience in the diagnosis and treatment of illness.

Following medical school, almost all M.D.s enter a residency—graduate medical education in a specialty that takes the form of paid on-the-job training, usually in a hospital. Most D.O.s serve a 12-month rotating internship after graduation and before entering a residency, which may last 2 to 6 years.

A physician's training is costly. According to the Association of American Medical Colleges, in 2004 more than 80

percent of medical school graduates were in debt for educational expenses.

Licensure and certification. All States, the District of Columbia, and U.S. territories license physicians. To be licensed, physicians must graduate from an accredited medical school, pass a licensing examination, and complete 1 to 7 years of graduate medical education. Although physicians licensed in one State usually can get a license to practice in another without further examination, some States limit reciprocity. Graduates of foreign medical schools generally can qualify for licensure after passing an examination and completing a U.S. residency.

M.D.s and D.O.s seeking board certification in a specialty may spend up to 7 years in residency training, depending on the specialty. A final examination immediately after residency or after 1 or 2 years of practice also is necessary for certification by a member board of the American Board of Medical Specialists (ABMS) or the American Osteopathic Association (AOA). The ABMS represents 24 boards related to medical specialties ranging from allergy and immunology to urology. The AOA has approved 18 specialty boards, ranging from anesthesiology to surgery. For certification in a subspecialty, physicians usually need another 1 to 2 years of residency.

Other qualifications. People who wish to become physicians must have a desire to serve patients, be self-motivated, and be able to survive the pressures and long hours of medical education and practice. Physicians also must have a good bedside manner, emotional stability, and the ability to make decisions in emergencies. Prospective physicians must be willing to study throughout their career to keep up with medical advances.

Advancement. Some physicians and surgeons advance by gaining expertise in specialties and subspecialties and by developing a reputation for excellence among their peers and patients. Many physicians and surgeons start their own practice or join a group practice. Others teach residents and other new doctors, and some advance to supervisory and managerial roles in hospitals, clinics, and other settings.

Employment

Physicians and surgeons held about 633,000 jobs in 2006; approximately 15 percent were self-employed. About half of

Table 1. Percent distribution of active physicians in patient care by specialty, 2005

	Percent
Total	100.0
Primary care	40.4
Family medicine and general practice	12.3
Internal medicine	15.0
Obstetrics & gynecology.....	5.5
Pediatrics.....	7.5
Specialties	59.6
Anesthesiology.....	5.2
Psychiatry.....	5.1
Surgical specialties, selected	10.8
All other specialties.....	38.5

SOURCE: American Medical Association, Physician Characteristics and Distribution in the US, 2007.

wage-and-salary physicians and surgeons worked in offices of physicians, and 18 percent were employed by hospitals. Others practiced in Federal, State, and local governments, including colleges, universities, and professional schools; private colleges, universities, and professional schools; and outpatient care centers.

According to 2005 data from the American Medical Association (AMA), about two in five physicians in patient care were in primary care, but not in a subspecialty of primary care. (See table 1.)

A growing number of physicians are partners or wage-and-salary employees of group practices. Organized as clinics or as associations of physicians, medical groups can more easily afford expensive medical equipment, can share support staff, and benefit from other business advantages.

According to the AMA, the New England and Middle Atlantic States have the highest ratio of physicians to population; the South Central and Mountain States have the lowest. D.O.s are more likely than M.D.s to practice in small cities and towns and in rural areas. M.D.s tend to locate in urban areas, close to hospitals and education centers.

Job Outlook

Employment of physicians and surgeons is expected to grow faster than the average for all occupations. Job opportunities should be very good, especially for physicians and surgeons willing to practice in specialties—including family practice, internal medicine, and OB/GYN—or in rural and low-income areas where there is a perceived shortage of medical practitioners.

Employment change. Employment of physicians and surgeons is projected to grow 14 percent from 2006 to 2016, faster than the average for all occupations. Job growth will occur because of continued expansion of health care related industries. The growing and aging population will drive overall growth in the demand for physician services, as consumers continue to demand high levels of care using the latest technologies, diagnostic tests, and therapies.

Demand for physicians' services is highly sensitive to changes in consumer preferences, health care reimbursement policies, and legislation. For example, if changes to health coverage result in consumers facing higher out-of-pocket costs, they may demand fewer physician services. Patients relying more on other health care providers—such as physician assistants, nurse practitioners, optometrists, and nurse anesthetists—also may temper demand for physician services. In addition, new technologies will increase physician productivity. These technologies include electronic medical records, test and prescription orders, billing, and scheduling.

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Physicians and surgeons.....	29-1060	633,000	723,000	90,000	14

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

Table 2. Median compensation for physicians, 2005

Specialty	Less than two years in specialty	Over one year in specialty
Anesthesiology.....	\$259,948	\$321,686
Surgery: General.....	228,839	282,504
Obstetrics/gynecology: General.....	203,270	247,348
Psychiatry: General.....	173,922	180,000
Internal medicine: General.....	141,912	166,420
Pediatrics: General.....	132,953	161,331
Family practice (without obstetrics) ...	137,119	156,010

SOURCE: Medical Group Management Association, Physician Compensation and Production Report, 2005.

Job prospects. Opportunities for individuals interested in becoming physicians and surgeons are expected to be very good. In addition to job openings from employment growth, numerous openings will result from the need to replace physicians and surgeons who retire over the 2006-16 decade.

Unlike their predecessors, newly trained physicians face radically different choices of where and how to practice. New physicians are much less likely to enter solo practice and more likely to take salaried jobs in group medical practices, clinics, and health networks.

Reports of shortages in some specialties, such as general or family practice, internal medicine, and OB/GYN, or in rural or low-income areas should attract new entrants, encouraging schools to expand programs and hospitals to increase available residency slots. However, because physician training is so lengthy, employment change happens gradually. In the short term, to meet increased demand, experienced physicians may work longer hours, delay retirement, or take measures to increase productivity, such as using more support staff to provide services. Opportunities should be particularly good in rural and low-income areas, as some physicians find these areas unattractive because of less control over work hours, isolation from medical colleagues, or other reasons.

Earnings

Earnings of physicians and surgeons are among the highest of any occupation. The Medical Group Management Association's Physician Compensation and Production Survey, reports that median total compensation for physicians in 2005 varied by specialty, as shown in table 2. Total compensation for physicians reflects the amount reported as direct compensation for tax purposes, plus all voluntary salary reductions. Salary, bonus and incentive payments, research stipends, honoraria, and distribution of profits were included in total compensation.

Self-employed physicians—those who own or are part owners of their medical practice—generally have higher

median incomes than salaried physicians. Earnings vary according to number of years in practice, geographic region, hours worked, skill, personality, and professional reputation. Self-employed physicians and surgeons must provide for their own health insurance and retirement.

Related Occupations

Physicians work to prevent, diagnose, and treat diseases, disorders, and injuries. Other health care practitioners who need similar skills and who exercise critical judgment include chiropractors, dentists, optometrists, physician assistants, podiatrists, registered nurses, and veterinarians.

Sources of Additional Information

For a list of medical schools and residency programs, as well as general information on premedical education, financial aid, and medicine as a career, contact:

➤ American Association of Colleges of Osteopathic Medicine, 5550 Friendship Blvd., Suite 310, Chevy Chase, MD 20815. Internet: <http://www.aacom.org>

➤ Association of American Medical Colleges, Section for Student Services, 2450 N St. NW., Washington, DC 20037.

Internet: <http://www.aamc.org/students>

For general information on physicians, contact:

➤ American Medical Association, 515 N. State St., Chicago, IL 60610. Internet: <http://www.ama-assn.org>

➤ American Osteopathic Association, Department of Communications, 142 East Ontario St., Chicago, IL 60611.

Internet: <http://www.osteopathic.org>

For information about various medical specialties, contact:

➤ American Academy of Family Physicians, Resident Student Activities Department, 11400 Tomahawk Creek Pkwy., Leawood, KS 66211. Internet: <http://fmignet.aafp.org>

➤ American Academy of Pediatrics, 141 Northwest Point Blvd., Elk Grove Village, IL 60007. Internet:

<http://www.aap.org>

➤ American Board of Medical Specialties, 1007 Church St., Suite 404, Evanston, IL 60201.

Internet: <http://www.abms.org>

➤ American College of Obstetricians and Gynecologists, 409 12th St. SW., P.O. Box 96920, Washington, DC 20090.

Internet: <http://www.acog.org>

➤ American College of Physicians, 190 North Independence Mall West, Philadelphia, PA 19106.

Internet: <http://www.acponline.org>

➤ American College of Surgeons, Division of Education, 633 North Saint Clair St., Chicago, IL 60611.

Internet: <http://www.facs.org>

➤ American Psychiatric Association, 1000 Wilson Blvd., Suite 1825, Arlington, VA 22209. Internet:

<http://www.psych.org>

➤ American Society of Anesthesiologists, 520 N. Northwest Hwy., Park Ridge, IL 60068.

Internet: <http://www.asahq.org/career/homepage.htm>

Information on Federal scholarships and loans is available from the directors of student financial aid at schools of medicine. Information on licensing is available from State boards of examiners.

Podiatrists

(O*NET 29-1081.00)

Significant Points

- Podiatrists must be licensed, requiring 3 to 4 years of undergraduate education, the completion of a 4-year podiatric college program, and passing scores on national and State examinations.
- While the occupation is small, job opportunities should be good for entry-level graduates of accredited podiatric medicine programs.
- Opportunities for newly trained podiatrists will be better in group medical practices, clinics, and health networks than in traditional, solo practices.
- Podiatrists enjoy very high earnings.

Nature of the Work

Americans spend a great deal of time on their feet. As the Nation becomes more active across all age groups, the need for foot care will become increasingly important.

The human foot is a complex structure. It contains 26 bones—plus muscles, nerves, ligaments, and blood vessels—and is designed for balance and mobility. The 52 bones in the feet make up about one-fourth of all the bones in the human body. Podiatrists, also known as *doctors of podiatric medicine* (DPMs), diagnose and treat disorders, diseases, and injuries of the foot and lower leg.

Podiatrists treat corns, calluses, ingrown toenails, bunions, heel spurs, and arch problems; ankle and foot injuries, deformities, and infections; and foot complaints associated with diabetes and other diseases. To treat these problems, podiatrists prescribe drugs and physical therapy, set fractures, and perform surgery. They also fit corrective shoe inserts called orthotics, design plaster casts and strappings to correct deformities, and design custom-made shoes. Podiatrists may use a force plate or scanner to help design the orthotics: patients walk across a plate connected to a computer that “reads” their feet, picking up pressure points and weight distribution. From the computer readout, podiatrists order the correct design or recommend another kind of treatment.

To diagnose a foot problem, podiatrists also order x-rays and laboratory tests. The foot may be the first area to show signs of serious conditions such as arthritis, diabetes, and heart disease. For example, patients with diabetes are prone to foot ulcers and infections because of poor circulation. Podiatrists consult with and refer patients to other health practitioners when they detect symptoms of these disorders.

Most podiatrists have a solo practice, although more are forming group practices with other podiatrists or health practitioners. Some specialize in surgery, orthopedics, primary care, or public health. Besides these board-certified specialties, podiatrists may practice other specialties, such as sports medicine,



Podiatrists diagnose and treat disorders of the feet and ankles.

pediatrics, dermatology, radiology, geriatrics, or diabetic foot care.

Podiatrists who are in private practice are responsible for running a small business. They may hire employees, order supplies, and keep records, among other tasks. In addition, some educate the community on the benefits of foot care through speaking engagements and advertising.

Work environment. Podiatrists usually work in small private offices or clinics, sometimes supported by a small staff of assistants and other administrative personnel. They also may spend time visiting patients in nursing homes or performing surgery at hospitals or ambulatory surgical centers. Podiatrists with private practices set their own hours but may work evenings and weekends to accommodate their patients. Podiatrists usually treat fewer emergencies than other doctors.

Training, Other Qualifications, and Advancement

Podiatrists must be licensed, requiring 3 to 4 years of undergraduate education, the completion of a 4-year podiatric college program, and passing scores on national and State examinations.

Education and training. Prerequisites for admission to a college of podiatric medicine include the completion of at least 90 semester hours of undergraduate study, an acceptable grade point average, and suitable scores on the Medical College Admission Test. (Some colleges also may accept the Dental Admission Test or the Graduate Record Exam.)

Admission to podiatric colleges usually requires at least 8 semester hours each of biology, inorganic chemistry, organic

chemistry, and physics and at least 6 hours of English. The science courses should be those designed for premedical students. Extracurricular and community activities, personal interviews, and letters of recommendation are also important. About 95 percent of podiatric students have at least a bachelor's degree.

In 2007, there were seven colleges of podiatric medicine fully accredited by the Council on Podiatric Medical Education. Colleges of podiatric medicine offer a 4-year program whose core curriculum is similar to that in other schools of medicine. During the first 2 years, students receive classroom instruction in basic sciences, including anatomy, chemistry, pathology, and pharmacology. Third-year and fourth-year students have clinical rotations in private practices, hospitals, and clinics. During these rotations, they learn how to take general and podiatric histories, perform routine physical examinations, interpret tests and findings, make diagnoses, and perform therapeutic procedures. Graduates receive the degree of Doctor of Podiatric Medicine (DPM).

Most graduates complete a hospital-based residency program after receiving a DPM. Residency programs last from 2 to 4 years. Residents receive advanced training in podiatric medicine and surgery and serve clinical rotations in anesthesiology, internal medicine, pathology, radiology, emergency medicine, and orthopedic and general surgery. Residencies lasting more than 1 year provide more extensive training in specialty areas.

Licensure. All States and the District of Columbia require a license for the practice of podiatric medicine. Each State defines its own licensing requirements, although many States grant reciprocity to podiatrists who are licensed in another State. Applicants for licensure must be graduates of an accredited college of podiatric medicine and must pass written and oral examinations. Some States permit applicants to substitute the examination of the National Board of Podiatric Medical Examiners, given in the second and fourth years of podiatric medical college, for part or all of the written State examination. In general, States require a minimum of 2 years of postgraduate residency training in an approved health care institution. For licensure renewal, most States require continuing education.

Other qualifications. People planning a career in podiatry should have scientific aptitude, manual dexterity, interpersonal skills, and a friendly bedside manner. In private practice, podiatrists also should have good business sense.

Certification and advancement. There are a number of certifying boards for the podiatric specialties of orthopedics, primary medicine, and surgery. Certification has requirements beyond licensure. Each board requires advanced training, the completion of written and oral examinations, and experience as a practicing podiatrist. Most managed-care organizations prefer board-certified podiatrists.

Podiatrists may advance to become professors at colleges of podiatric medicine, department chiefs in hospitals, or general health administrators.

Employment

Podiatrists held about 12,000 jobs in 2006. About 24 percent of podiatrists were self-employed. Most podiatrists were solo practitioners, although more are entering group practices with other podiatrists or other health practitioners. Solo practitioners primarily were unincorporated self-employed workers, al-

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Podiatrists.....	29-1081	12,000	13,000	1,100	9

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

though some also were incorporated wage and salary workers in offices of other health practitioners. Other podiatrists were employed by hospitals, long-term care facilities, the Federal Government, and municipal health departments.

Job Outlook

Employment is expected to increase about as fast as average because of increasing consumer demand for podiatric medicine services. Job prospects should be good.

Employment change. Employment of podiatrists is expected to increase 9 percent from 2006 to 2016, about as fast as the average for all occupations. More people will turn to podiatrists for foot care because of the rising number of injuries sustained by a more active and increasingly older population.

Medicare and most private health insurance programs cover acute medical and surgical foot services, as well as diagnostic x-rays and leg braces. Details of such coverage vary among plans. However, routine foot care, including the removal of corns and calluses, is not usually covered unless the patient has a systemic condition that has resulted in severe circulatory problems or areas of desensitization in the legs or feet. Like dental services, podiatric care is often discretionary and, therefore, more dependent on disposable income than some other medical services.

Employment of podiatrists would grow even faster were it not for continued emphasis on controlling the costs of specialty health care. Insurers will balance the cost of sending patients to podiatrists against the cost and availability of substitute practitioners, such as physicians and physical therapists.

Job prospects. Although the occupation is small and most podiatrists continue to practice until retirement, job opportunities should be good for entry-level graduates of accredited podiatric medicine programs. Job growth and replacement needs should create enough job openings for the supply of new podiatric medicine graduates. Opportunities will be better for board-certified podiatrists because many managed-care organizations require board certification. Newly trained podiatrists will find more opportunities in group medical practices, clinics, and health networks than in traditional solo practices. Establishing a practice will be most difficult in the areas surrounding colleges of podiatric medicine, where podiatrists concentrate.

Earnings

Podiatrists enjoy very high earnings. Median annual earnings of salaried podiatrists were \$108,220 in 2006. Additionally, a survey by *Podiatry Management Magazine* reported median net income of \$114,000 in 2006. Podiatrists in partnerships tended to earn higher net incomes than those in solo practice. A salaried podiatrist typically receives health insurance and retirement benefits from their employer, whereas self-employed chiropractors must provide for their own health insurance and retirement. Also, solo practitioners must absorb the costs of running their own offices.

Related Occupations

Other workers, who apply medical knowledge to prevent, diagnose, and treat muscle and bone disorders and injuries include athletic trainers, chiropractors, massage therapists, occupational therapists, physical therapists, and physicians and surgeons. Workers who specialize in developing orthopedic shoe inserts, braces, and prosthetic limbs are orthotists and prosthetists.

Sources of Additional Information

For information on a career in podiatric medicine, contact:

► American Podiatric Medical Association, 9312 Old Georgetown Rd., Bethesda, MD 20814-1621.

Internet: <http://www.apma.org>

Information on colleges of podiatric medicine and their entrance requirements, curricula, and student financial aid is available from:

► American Association of Colleges of Podiatric Medicine, 15850 Crabbs Branch Way, Suite 320, Rockville, MD 20855-2622. Internet: <http://www.aacpm.org>

Radiation Therapists

(O*NET 29-1124.00)

Significant Points

- A bachelor's degree, associate degree, or certificate in radiation therapy is generally required.
- Good job opportunities are expected.
- Employment is projected to grow much faster than the average for all occupations.

Nature of the Work

Treating cancer in the human body is the principal use of radiation therapy. As part of a medical radiation oncology team, radiation therapists use machines—called linear accelerators—to administer radiation treatment to patients. Linear accelerators, used in a procedure called external beam therapy, project high-energy x-rays at targeted cancer cells. As the x-rays collide with human tissue, they produce highly energized ions that can shrink and eliminate cancerous tumors. Radiation therapy is sometimes used as the sole treatment for cancer, but is usually used in conjunction with chemotherapy or surgery.

The first step in the radiation therapy process is simulation. During simulation, the radiation therapist uses an x-ray imaging machine or computer tomography (CT) scan to pinpoint the location of the tumor. The therapist then positions the patient and adjusts the linear accelerator so that, when treatment begins, radiation exposure is concentrated on the tumor cells.

The radiation therapist then develops a treatment plan in conjunction with a radiation oncologist (a physician who specializes in therapeutic radiology), and a dosimetrist (a technician who calculates the dose of radiation that will be used for treatment). The therapist later explains the treatment plan to the patient and answers any questions that the patient may have.

The next step in the process is treatment. To begin, the radiation therapist positions the patient and adjusts the linear accelerator according to the guidelines established in simulation. Then, from a separate room that is protected from the x-ray radiation, the therapist operates the linear accelerator and monitors the patient's condition through a TV monitor and an intercom system. Treatment can take anywhere from 10 to 30 minutes and is usually administered once a day, 5 days a week, for 2 to 9 weeks.

During the treatment phase, the radiation therapist monitors the patient's physical condition to determine if any adverse side effects are taking place. The therapist must also be aware of the patient's emotional wellbeing. Because many patients are under stress and are emotionally fragile, it is important for the therapist to maintain a positive attitude and provide emotional support.

Radiation therapists keep detailed records of their patients' treatments. These records include information such as the dose of radiation used for each treatment, the total amount of radiation used to date, the area treated, and the patient's reactions.



Radiation therapists work in hospitals and cancer treatment centers.

Radiation oncologists and dosimetrists review these records to ensure that the treatment plan is working, to monitor the amount of radiation exposure that the patient has received, and to keep side effects to a minimum.

Radiation therapists also assist medical radiation physicists, workers who monitor and adjust the linear accelerator. Because radiation therapists often work alone during the treatment phase, they need to be able to check the linear accelerator for problems and make any adjustments that are needed. Therapists also may assist dosimetrists with routine aspects of dosimetry, the process used to calculate radiation dosages.

Work environment. Radiation therapists work in hospitals or in cancer treatment centers. These places are clean, well lighted, and well ventilated. Therapists do a considerable amount of lifting and must be able to help disabled patients get on and off treatment tables. They spend most of their time on their feet.

Radiation therapists generally work 40 hours a week, and unlike those in other health care occupations, they normally work only during the day. However, because radiation therapy emergencies do occur, some therapists are required to be on call and may have to work outside of their normal hours.

Working with cancer patients can be stressful, but many radiation therapists also find it rewarding. Because they work around radioactive materials, radiation therapists take great care to ensure that they are not exposed to dangerous levels of radiation. Following standard safety procedures can prevent overexposure.

Training, Other Qualifications, and Advancement

A bachelor's degree, associate degree, or certificate in radiation therapy generally is required. Many States also require radiation therapists to be licensed. With experience, therapists can advance to managerial positions.

Education and training. Employers usually require applicants to complete an associate or a bachelor's degree program in radiation therapy. Individuals also may become qualified by completing an associate or a bachelor's degree program in radiography, which is the study of radiological imaging, and then completing a 12-month certificate program in radiation therapy. Radiation therapy programs include core courses on radiation therapy procedures and the scientific theories behind them. In addition, such programs often include courses on human anatomy and physiology, physics, algebra, precalculus, writing, public speaking, computer science, and research methodology. In 2007 there were 123 radiation therapy programs accredited by the American Registry of Radiologic Technologists (ARRT).

Licensure. In 2007, 32 States required radiation therapists to be licensed by a State accrediting board. Licensing requirements vary by State, but many States require applicants to pass the ARRT certification examination. Further information is available from individual State licensing offices.

Certification and other qualifications. Some States, as well as many employers, require that radiation therapists be certified by ARRT. To become ARRT-certified, an applicant must complete an accredited radiation therapy program, adhere to ARRT ethical standards, and pass the ARRT certification examination. The examination and accredited academic programs cover ra-

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Radiation therapists.....	29-1124	15,000	18,000	3,600	25

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

diation protection and quality assurance, clinical concepts in radiation oncology, treatment planning, treatment delivery, and patient care and education. Candidates also must demonstrate competency in several clinical practices including patient care activities; simulation procedures; dosimetry calculations; fabrication of beam modification devices; low-volume, high-risk procedures, and the application of radiation.

ARRT certification is valid for 1 year, after which therapists must renew their certification. Requirements for renewal include abiding by the ARRT ethical standards, paying annual dues, and satisfying continuing education requirements. Continuing education requirements must be met every 2 years and include either the completion of 24 credits of radiation therapy-related courses or the attainment of ARRT certification in a discipline other than radiation therapy. Certification renewal, however, may not be required by all States or employers that require initial certification.

All radiation therapists need good communication skills because their work involves a great deal of patient interaction. Individuals interested in becoming radiation therapists should be psychologically capable of working with cancer patients. They should be caring and empathetic because they work with patients who are ill and under stress. They should be able to keep accurate, detailed records. They also should be physically fit because they work on their feet for long periods and lift and move disabled patients.

Advancement. Experienced radiation therapists may advance to manage radiation therapy programs in treatment centers or other health care facilities. Managers generally continue to treat patients while taking on management responsibilities. Other advancement opportunities include teaching, technical sales, and research. With additional training and certification, therapists also can become dosimetrists, who use complex mathematical formulas to calculate proper radiation doses.

Employment

Radiation therapists held about 15,000 jobs in 2006. About 73 percent worked in hospitals, and about 17 percent worked in the offices of physicians. A small proportion worked in outpatient care centers.

Job Outlook

Employment is expected to increase much faster than the average from 2006 to 2016, and job prospects should be good.

Employment change. Employment of radiation therapists is projected to grow by 25 percent between 2006 and 2016, which is much faster than the average for all occupations. As the U.S. population grows and an increasing share of it is in the older age groups, the number of people needing treatment is expected to increase and to spur demand for radiation therapists. In addition, as radiation technology advances and is able to treat

more types of cancer, radiation therapy will be prescribed more often.

Job prospects. Job prospects are expected to be good. Job openings will result from employment growth and from the need to replace workers who retire or leave the occupation for other reasons. Applicants who are certified should have the best opportunities.

Earnings

Median annual earnings of wage-and-salary radiation therapists were \$66,170 in May 2006. The middle 50 percent earned between \$54,170 and \$78,550. The lowest 10 percent earned less than \$44,840, and the highest 10 percent earned more than \$92,110. Median annual earnings in the industries that employed the largest numbers of radiation therapists in May 2006 are as follows:

Outpatient care centers.....	\$73,810
Offices of physicians.....	70,050
General medical and surgical hospitals.....	63,580

Some employers also reimburse their employees for the cost of continuing education.

Related Occupations

Radiation therapists use advanced machinery to administer medical treatment to patients. Other occupations that perform similar duties include radiologic technologists and technicians, diagnostic medical sonographers, nuclear medicine technologists, cardiovascular technologists and technicians, dental hygienists, respiratory therapists, physical therapist assistants and aides, registered nurses, and physicians and surgeons.

Other occupations that build relationships with patients and provide them with emotional support include nursing, psychiatric, and home health aides; counselors; psychologists; social workers; and social and human service assistants.

Sources of Additional Information

Information on certification by the American Registry of Radiologic Technologists and on accredited radiation therapy programs may be obtained from:

► American Registry of Radiologic Technologists, 1255 Northland Dr., St. Paul, MN 55120.

Internet: <http://www.arrrt.org>

Information on careers in radiation therapy may be obtained from:

► American Society of Radiologic Technologists, 15000 Central Ave., SE., Albuquerque, NM 87123.

Internet: <http://www.asrt.org>

Recreational Therapists

(O*NET 29-1125.00)

Significant Points

- Recreational therapists will experience competition for jobs.
- A bachelor's degree in therapeutic recreation is the usual requirement for entry-level positions.
- Recreational therapists should be comfortable working with persons who are ill or who have disabilities.

Nature of the Work

Recreational therapists, also referred to as *therapeutic recreation specialists*, provide treatment services and recreation activities for individuals with disabilities or illnesses. Using a variety of techniques, including arts and crafts, animals, sports, games, dance and movement, drama, music, and community outings, therapists improve and maintain the physical, mental, and emotional well-being of their clients. Therapists help individuals reduce depression, stress, and anxiety; recover basic motor functioning and reasoning abilities; build confidence; and socialize effectively so that they can enjoy greater independence and reduce or eliminate the effects of their illness or disability. In addition, therapists help people with disabilities integrate into the community by teaching them how to use community resources and recreational activities. Recreational therapists are different from recreation workers, who organize recreational activities primarily for enjoyment. (Recreation workers are discussed elsewhere in the *Handbook*.)

In acute health care settings, such as hospitals and rehabilitation centers, recreational therapists treat and rehabilitate individuals with specific health conditions, usually in conjunction or collaboration with physicians, nurses, psychologists, social workers, and physical and occupational therapists. In long-term and residential care facilities, recreational therapists use leisure activities—especially structured group programs—to improve and maintain their clients' general health and well-being. They also may provide interventions to prevent the client from suffering further medical problems and complications.

Recreational therapists assess clients using information from observations, medical records, standardized assessments, the medical staff, the clients' families, and the clients themselves. They then develop and carry out therapeutic interventions consistent with the clients' needs and interests. For example, they may encourage clients who are isolated from others or who have limited social skills to play games with others, and they may teach right-handed people with right-side paralysis how to use their unaffected left side to throw a ball or swing a racket. Recreational therapists may instruct patients in relaxation techniques to reduce stress and tension, stretching and limbering exercises, proper body mechanics for participation in recreational activities, pacing and energy conserva-



Recreational therapists use various techniques, including cognitive tests, to treat clients and maintain their well-being.

tion techniques, and team activities. As they work, therapists observe and document a patient's participation, reactions, and progress.

Community-based recreational therapists may work in park and recreation departments, special-education programs for school districts, or assisted-living, adult day care, and substance abuse rehabilitation centers. In these programs, therapists use interventions to develop specific skills, while providing opportunities for exercise, mental stimulation, creativity, and fun. Those few who work in schools help counselors, teachers, and parents address the special needs of students, including easing disabled students' transition into adult life.

Work environment. Recreational therapists provide services in special activity rooms but also plan activities and prepare documentation in offices. When working with clients during community integration programs, they may travel locally to teach clients how to use public transportation and other public areas, such as parks, playgrounds, swimming pools, restaurants, and theaters. Therapists often lift and carry equipment. Recreational therapists generally work a 40-hour week that may include some evenings, weekends, and holidays.

Training, Other Qualifications, and Advancement

A bachelor's degree with a major or concentration in therapeutic recreation is the usual requirement for entry-level positions. Some States regulate recreational therapists, but requirements vary.

Education and training. Most entry-level recreational therapists need a bachelor's degree in therapeutic recreation, or in recreation with a concentration in therapeutic recreation. People may qualify for paraprofessional positions with an associate degree in therapeutic recreation or another subject related to health care. An associate degree in recreational therapy; training in art, drama, or music therapy; or qualifying

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Recreational therapists.....	29-1125	25,000	26,000	900	4

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

work experience may be sufficient for activity director positions in nursing homes.

Approximately 130 academic programs prepare students to become recreational therapists. Most offer bachelor’s degrees, although some also offer associate, master’s, or doctoral degrees. Therapeutic recreation programs include courses in assessment, treatment and program planning, intervention design, and evaluation. Students also study human anatomy, physiology, abnormal psychology, medical and psychiatric terminology, characteristics of illnesses and disabilities, professional ethics, and the use of assistive devices and technology.

Licensure. Some States regulate recreational therapists through licensure, registration, or regulation of titles. Requirements vary by State. In 2006, North Carolina, Utah, and New Hampshire required licensure to practice as a recreational therapist.

Certification and other qualifications. Although certification is usually voluntary, most employers prefer to hire candidates who are certified therapeutic recreation specialists. In 2006, about 3 out of 4 recreational therapists worked in a clinical setting, which often requires certification by the National Council for Therapeutic Recreation Certification. The council offers the Certified Therapeutic Recreation Specialist credential to candidates who have a bachelor’s or graduate degree from an accredited educational institution, pass a written certification examination, and complete a supervised internship of at least 480 hours. Therapists must meet additional requirements to maintain certification.

Therapists can also earn certifications in specific areas, such as art therapy and aquatic therapy.

Recreational therapists must be comfortable working with people who are ill or disabled. Therapists must be patient, tactful, and persuasive when working with people who have a variety of special needs. Ingenuity, a sense of humor, and imagination are needed to adapt activities to individual needs, and good physical coordination is necessary to demonstrate or participate in recreational activities.

Advancement. Therapists may advance to supervisory or administrative positions. Some teach, conduct research, or consult for health or social services agencies.

Employment

Recreational therapists held about 25,000 jobs in 2006. About 70 percent were in nursing and residential care facilities and hospitals. Others worked in State and local government agencies and in community care facilities for the elderly, including assisted-living facilities. The rest worked primarily in residential mental retardation, mental health, and substance abuse facilities; individual and family services; Federal Government

agencies; educational services; and outpatient care centers. Only a small number of therapists were self-employed, generally contracting with long-term care facilities or community agencies to develop and oversee programs.

Job Outlook

Overall employment of recreational therapists is expected to grow more slowly than the average for all occupations. Competition for jobs is expected.

Employment change. Employment of recreational therapists is expected to increase 4 percent from 2006 to 2016, slower than the average for all occupations. Employment of recreational therapists will grow to meet the therapy needs of the increasing number of older adults. In nursing care facilities—the largest industry employing recreational therapists—employment will grow slightly faster than the occupation as a whole as the number of older adults continues to grow. Fast employment growth is expected in the residential and outpatient settings that serve people who are physically disabled, cognitively disabled, or elderly or who have mental illness or substance abuse problems. Employment is expected to decline in hospitals, however, as services shift to outpatient settings and employers emphasize cost containment.

Health care facilities will support a growing number of jobs in adult day care and outpatient programs offering short-term mental health and alcohol or drug abuse services. Rehabilitation, home health care, and transitional programs will provide additional jobs.

Job prospects. Recreational therapists will experience competition for jobs. Job opportunities should be best for people with a bachelor’s degree in therapeutic recreation or in recreation with courses in therapeutic recreation. Opportunities also should be good for therapists who hold specialized certifications such as aquatic therapy, meditation, or crisis intervention. Recreational therapists might experience more competition for jobs in certain regions of the country.

Earnings

Median annual earnings of recreational therapists were \$34,990 in May 2006. The middle 50 percent earned between \$26,780 and \$44,850. The lowest 10 percent earned less than \$20,880, and the highest 10 percent earned more than \$55,530. Median annual earnings in the industries employing the largest numbers of recreational therapists in May 2006 were:

General medical and surgical hospitals.....	\$39,320
State government.....	38,260
Psychiatric and substance abuse hospitals.....	37,560
Nursing care facilities.....	30,440
Community care facilities for the elderly.....	28,980

Related Occupations

Recreational therapists primarily design activities to help people with disabilities lead more fulfilling and independent lives. Other workers who have similar jobs are occupational therapists, physical therapists, recreation workers, rehabilitation counselors, and teachers—special education.

Sources of Additional Information

For information and materials on careers and academic programs in recreational therapy, contact:

➤ American Therapeutic Recreation Association, 1414 Prince St., Suite 204, Alexandria, VA 22314-2853.

Internet: <http://www.atra-tr.org>

➤ National Therapeutic Recreation Society, 22377 Belmont Ridge Rd., Ashburn, VA 20148-4501. Internet:

<http://www.nrpa.org/content/default.aspx?documentid=530>

Information on certification may be obtained from:

➤ National Council for Therapeutic Recreation Certification, 7 Elmwood Dr., New City, NY 10956.

Internet: <http://www.nctrc.org>

For information on licensure requirements, contact the appropriate recreational therapy regulatory agency for your State.

Registered Nurses

(O*NET 29-1111.00)

Significant Points

- Registered nurses constitute the largest health care occupation, with 2.5 million jobs.
- About 59 percent of jobs are in hospitals.
- The three major educational paths to registered nursing are a bachelor's degree, an associate degree, and a diploma from an approved nursing program.
- Registered nurses are projected to generate about 587,000 new jobs over the 2006-16 period, one of the largest numbers among all occupations; overall job opportunities are expected to be excellent, but may vary by employment setting.

Nature of the Work

Registered nurses (RNs), regardless of specialty or work setting, treat patients, educate patients and the public about various medical conditions, and provide advice and emotional support to patients' family members. RNs record patients' medical histories and symptoms, help perform diagnostic tests and analyze results, operate medical machinery, administer treatment and medications, and help with patient follow-up and rehabilitation.

RNs teach patients and their families how to manage their illness or injury, explaining post-treatment home care needs; diet, nutrition, and exercise programs; and self-administration of medication and physical therapy. Some RNs work to promote general health by educating the public on warning signs and symptoms of disease. RNs also might run general health

screening or immunization clinics, blood drives, and public seminars on various conditions.

When caring for patients, RNs establish a plan of care or contribute to an existing plan. Plans may include numerous activities, such as administering medication, including careful checking of dosages and avoiding interactions; starting, maintaining, and discontinuing intravenous (IV) lines for fluid, medication, blood, and blood products; administering therapies and treatments; observing the patient and recording those observations; and consulting with physicians and other health care clinicians. Some RNs provide direction to licensed practical nurses and nursing aids regarding patient care. RNs with advanced educational preparation and training may perform diagnostic and therapeutic procedures and may have prescriptive authority.

RNs can specialize in one or more areas of patient care. There generally are four ways to specialize. RNs can choose a particular work setting or type of treatment, such as perioperative nurses, who work in operating rooms and assist surgeons. RNs also may choose to specialize in specific health conditions, as do diabetes management nurses, who assist patients to manage diabetes. Other RNs specialize in working with one or more organs or body system types, such as dermatology nurses, who work with patients who have skin disorders. RNs also can choose to work with a well-defined population, such as geriatric nurses, who work with the elderly. Some RNs may combine specialties. For example, pediatric oncology nurses deal with children and adolescents who have cancer.

There are many options for RNs who specialize in a work setting or type of treatment. *Ambulatory care nurses* provide preventive care and treat patients with a variety of illnesses and injuries in physicians' offices or in clinics. Some ambulatory care nurses are involved in telehealth, providing care and advice through electronic communications media such as videoconferencing, the Internet, or by telephone. *Critical care nurses* provide care to patients with serious, complex, and acute illnesses or injuries that require very close monitoring and extensive medication protocols and therapies. Critical care nurses often work in critical or intensive care hospital units. *Emergency, or trauma, nurses* work in hospital or stand-alone emergency departments, providing initial assessments and care for patients with life-threatening conditions. Some emergency nurses may become qualified to serve as transport nurses, who provide medical care to patients who are transported by helicopter or airplane to the nearest medical facility. *Holistic nurses* provide care such as acupuncture, massage and aroma therapy, and bio-feedback, which are meant to treat patients' mental and spiritual health in addition to their physical health. *Home health care nurses* provide at-home nursing care for patients, often as follow-up care after discharge from a hospital or from a rehabilitation, long-term care, or skilled nursing facility. *Hospice and palliative care nurses* provide care, most often in home or hospice settings, focused on maintaining quality of life for terminally ill patients. *Infusion nurses* administer medications, fluids, and blood to patients through injections into patients' veins. *Long-term care nurses* provide health care services on a recurring basis to patients with chronic physical or mental disorders, often in long-term care or skilled nursing facilities. *Medical-surgical nurses* provide health promotion and basic medical

care to patients with various medical and surgical diagnoses. *Occupational health nurses* seek to prevent job-related injuries and illnesses, provide monitoring and emergency care services, and help employers implement health and safety standards. *Perianesthesia nurses* provide preoperative and postoperative care to patients undergoing anesthesia during surgery or other procedure. *Perioperative nurses* assist surgeons by selecting and handling instruments, controlling bleeding, and suturing incisions. Some of these nurses also can specialize in plastic and reconstructive surgery. *Psychiatric-mental health nurses* treat patients with personality and mood disorders. *Radiology nurses* provide care to patients undergoing diagnostic radiation procedures such as ultrasounds, magnetic resonance imaging, and radiation therapy for oncology diagnoses. *Rehabilitation nurses* care for patients with temporary and permanent disabilities. *Transplant nurses* care for both transplant recipients and living donors and monitor signs of organ rejection.

RNs specializing in a particular disease, ailment, or health care condition are employed in virtually all work settings, including physicians' offices, outpatient treatment facilities, home health care agencies, and hospitals. *Addictions nurses* care for patients seeking help with alcohol, drug, tobacco, and other addictions. *Intellectual and developmental disabilities nurses* provide care for patients with physical, mental, or behavioral disabilities; care may include help with feeding, controlling bodily functions, sitting or standing independently, and speaking or other communication. *Diabetes management nurses* help diabetics to manage their disease by teaching them proper nutrition and showing them how to test blood sugar levels and administer insulin injections. *Genetics nurses* provide early detection screenings, counseling, and treatment of patients with genetic disorders, including cystic fibrosis and Huntington's disease. *HIV/AIDS nurses* care for patients diagnosed with HIV and AIDS. *Oncology nurses* care for patients with various types of cancer and may assist in the administration of radiation and chemotherapies and follow-up monitoring. *Wound, ostomy, and continence nurses* treat patients with wounds caused by traumatic injury, ulcers, or arterial disease; provide postoperative care for patients with openings that allow for alternative



Registered nurses who work in schools provide general health care to students.

methods of bodily waste elimination; and treat patients with urinary and fecal incontinence.

RNs specializing in treatment of a particular organ or body system usually are employed in hospital specialty or critical care units, specialty clinics, and outpatient care facilities. *Cardiovascular nurses* treat patients with coronary heart disease and those who have had heart surgery, providing services such as postoperative rehabilitation. *Dermatology nurses* treat patients with disorders of the skin, such as skin cancer and psoriasis. *Gastroenterology nurses* treat patients with digestive and intestinal disorders, including ulcers, acid reflux disease, and abdominal bleeding. Some nurses in this field also assist in specialized procedures such as endoscopies, which look inside the gastrointestinal tract using a tube equipped with a light and a camera that can capture images of diseased tissue. *Gynecology nurses* provide care to women with disorders of the reproductive system, including endometriosis, cancer, and sexually transmitted diseases. *Nephrology nurses* care for patients with kidney disease caused by diabetes, hypertension, or substance abuse. *Neuroscience nurses* care for patients with dysfunctions of the nervous system, including brain and spinal cord injuries and seizures. *Ophthalmic nurses* provide care to patients with disorders of the eyes, including blindness and glaucoma, and to patients undergoing eye surgery. *Orthopedic nurses* care for patients with muscular and skeletal problems, including arthritis, bone fractures, and muscular dystrophy. *Otorhinolaryngology nurses* care for patients with ear, nose, and throat disorders, such as cleft palates, allergies, and sinus disorders. *Respiratory nurses* provide care to patients with respiratory disorders such as asthma, tuberculosis, and cystic fibrosis. *Urology nurses* care for patients with disorders of the kidneys, urinary tract, and male reproductive organs, including infections, kidney and bladder stones, and cancers.

RNs who specialize by population provide preventive and acute care in all health care settings to the segment of the population in which they specialize, including newborns (neonatology), children and adolescents (pediatrics), adults, and the elderly (gerontology or geriatrics). RNs also may provide basic health care to patients outside of health care settings in such venues as including correctional facilities, schools, summer camps, and the military. Some RNs travel around the United States and abroad providing care to patients in areas with shortages of health care workers.

Most RNs work as staff nurses as members of a team providing critical health care. However, some RNs choose to become advanced practice nurses, who work independently or in collaboration with physicians, and may focus on the provision of primary care services. *Clinical nurse specialists* provide direct patient care and expert consultations in one of many nursing specialties, such as psychiatric-mental health. *Nurse anesthetists* provide anesthesia and related care before and after surgical, therapeutic, diagnostic and obstetrical procedures. They also provide pain management and emergency services, such as airway management. *Nurse-midwives* provide primary care to women, including gynecological exams, family planning advice, prenatal care, assistance in labor and delivery, and neonatal care. *Nurse practitioners* serve as primary and specialty care providers, providing a blend of nursing and health care services

to patients and families. The most common specialty areas for nurse practitioners are family practice, adult practice, women's health, pediatrics, acute care, and geriatrics. However, there are a variety of other specialties that nurse practitioners can choose, including neonatology and mental health. Advanced practice nurses can prescribe medications in all States and in the District of Columbia.

Some nurses have jobs that require little or no direct patient care, but still require an active RN license. *Case managers* ensure that all of the medical needs of patients with severe injuries and severe or chronic illnesses are met. *Forensics nurses* participate in the scientific investigation and treatment of abuse victims, violence, criminal activity, and traumatic accident. *Infection control nurses* identify, track, and control infectious outbreaks in health care facilities and develop programs for outbreak prevention and response to biological terrorism. *Legal nurse consultants* assist lawyers in medical cases by interviewing patients and witnesses, organizing medical records, determining damages and costs, locating evidence, and educating lawyers about medical issues. *Nurse administrators* supervise nursing staff, establish work schedules and budgets, maintain medical supply inventories, and manage resources to ensure high-quality care. *Nurse educators* plan, develop, implement, and evaluate educational programs and curricula for the professional development of student nurses and RNs. *Nurse informaticists* manage and communicate nursing data and information to improve decision making by consumers, patients, nurses, and other health care providers. RNs also may work as health care consultants, public policy advisors, pharmaceutical and medical supply researchers and salespersons, and medical writers and editors.

Work environment. Most RNs work in well-lighted, comfortable health care facilities. Home health and public health nurses travel to patients' homes, schools, community centers, and other sites. RNs may spend considerable time walking, bending, stretching, and standing. Patients in hospitals and nursing care facilities require 24-hour care; consequently, nurses in these institutions may work nights, weekends, and holidays. RNs also may be on call—available to work on short notice. Nurses who work in offices, schools, and other settings that do not provide 24-hour care are more likely to work regular business hours. About 21 percent of RNs worked part time in 2006, and 7 percent held more than one job.

Nursing has its hazards, especially in hospitals, nursing care facilities, and clinics, where nurses may be in close contact with individuals who have infectious diseases and with toxic, harmful, or potentially hazardous compounds, solutions, and medications. RNs must observe rigid, standardized guidelines to guard against disease and other dangers, such as those posed by radiation, accidental needle sticks, chemicals used to sterilize instruments, and anesthetics. In addition, they are vulnerable to back injury when moving patients, shocks from electrical equipment, and hazards posed by compressed gases. RNs also may suffer emotional strain from caring for patients suffering unrelieved intense pain, close personal contact with patients' families, the need to make critical decisions, and ethical dilemmas and concerns.

Training, Other Qualifications, and Advancement

The three major educational paths to registered nursing are a bachelor's degree, an associate degree, and a diploma from an approved nursing program. Nurses most commonly enter the occupation by completing an associate degree or bachelor's degree program. Individuals then must complete a national licensing examination in order to obtain a nursing license. Further training or education can qualify nurses to work in specialty areas, and may help improve advancement opportunities.

Education and training. There are three major educational paths to registered nursing—a bachelor's of science degree in nursing (BSN), an associate degree in nursing (ADN), and a diploma. BSN programs, offered by colleges and universities, take about 4 years to complete. In 2006, 709 nursing programs offered degrees at the bachelor's level. ADN programs, offered by community and junior colleges, take about 2 to 3 years to complete. About 850 RN programs granted associate degrees. Diploma programs, administered in hospitals, last about 3 years. Only about 70 programs offered diplomas. Generally, licensed graduates of any of the three types of educational programs qualify for entry-level positions.

Many RNs with an ADN or diploma later enter bachelor's programs to prepare for a broader scope of nursing practice. Often, they can find an entry-level position and then take advantage of tuition reimbursement benefits to work toward a BSN by completing an RN-to-BSN program. In 2006, there were 629 RN-to-BSN programs in the United States. Accelerated master's degree in nursing (MSN) programs also are available by combining 1 year of an accelerated BSN program with 2 years of graduate study. In 2006, there were 149 RN-to-MSN programs.

Accelerated BSN programs also are available for individuals who have a bachelor's or higher degree in another field and who are interested in moving into nursing. In 2006, 197 of these programs were available. Accelerated BSN programs last 12 to 18 months and provide the fastest route to a BSN for individuals who already hold a degree. MSN programs also are available for individuals who hold a bachelor's or higher degree in another field.

Individuals considering nursing should carefully weigh the advantages and disadvantages of enrolling in a BSN or MSN program because, if they do, their advancement opportunities usually are broader. In fact, some career paths are open only to nurses with a bachelor's or master's degree. A bachelor's degree often is necessary for administrative positions and is a prerequisite for admission to graduate nursing programs in research, consulting, and teaching, and all four advanced practice nursing specialties—clinical nurse specialists, nurse anesthetists, nurse-midwives, and nurse practitioners. Individuals who complete a bachelor's receive more training in areas such as communication, leadership, and critical thinking, all of which are becoming more important as nursing care becomes more complex. Additionally, bachelor's degree programs offer more clinical experience in nonhospital settings. Education beyond a bachelor's degree can also help students looking to enter certain fields or increase advancement opportunities. In 2006, 448 nursing schools offered master's degrees, 108 offered doctoral degrees, and 58 offered accelerated BSN-to-doctoral programs.

All four advanced practice nursing specialties require at least a master’s degree. Most programs include about 2 years of full-time study and require a BSN degree for entry; some programs require at least 1 to 2 years of clinical experience as an RN for admission. In 2006, there were 342 master’s and post-master’s programs offered for nurse practitioners, 230 master’s and post-master’s programs for clinical nurse specialists, 106 programs for nurse anesthetists, and 39 programs for nurse-midwives.

All nursing education programs include classroom instruction and supervised clinical experience in hospitals and other health care facilities. Students take courses in anatomy, physiology, microbiology, chemistry, nutrition, psychology and other behavioral sciences, and nursing. Coursework also includes the liberal arts for ADN and BSN students.

Supervised clinical experience is provided in hospital departments such as pediatrics, psychiatry, maternity, and surgery. A growing number of programs include clinical experience in nursing care facilities, public health departments, home health agencies, and ambulatory clinics.

Licensure and certification. In all States, the District of Columbia, and U.S. territories, students must graduate from an approved nursing program and pass a national licensing examination, known as the NCLEX-RN, in order to obtain a nursing license. Nurses may be licensed in more than one State, either by examination or by the endorsement of a license issued by another State. The Nurse Licensure Compact Agreement allows a nurse who is licensed and permanently resides in one of the member States to practice in the other member States without obtaining additional licensure. In 2006, 20 states were members of the Compact, while 2 more were pending membership. All States require periodic renewal of licenses, which may require continuing education.

Certification is common, and sometimes required, for the four advanced practice nursing specialties—clinical nurse specialists, nurse anesthetists, nurse-midwives, and nurse practitioners. Upon completion of their educational programs, most advanced practice nurses become nationally certified in their area of specialty. Certification also is available in specialty areas for all nurses. In some States, certification in a specialty is required in order to practice that specialty.

Foreign-educated and foreign-born nurses wishing to work in the United States must obtain a work visa. To obtain the visa, nurses must undergo a federal screening program to ensure that their education and licensure are comparable to that of a U.S. educated nurse, that they have proficiency in written and spoken English, and that they have passed either the Commission on Graduates of Foreign Nursing Schools (CGFNS) Qualifying Examination or the NCLEX-RN. CGFNS administers the VisaScreen Program. (The Commission is an immigration-neutral, nonprofit organization that is recognized internationally as an authority on credentials evaluation in the health care field.)

Nurses educated in Australia, Canada (except Quebec), Ireland, New Zealand, and the United Kingdom, or foreign-born nurses who were educated in the United States, are exempt from the language proficiency testing. In addition to these national requirements, foreign-born nurses must obtain state licensure in order to practice in the United States. Each State has its own requirements for licensure.

Other qualifications. Nurses should be caring, sympathetic, responsible, and detail oriented. They must be able to direct or supervise others, correctly assess patients’ conditions, and determine when consultation is required. They need emotional stability to cope with human suffering, emergencies, and other stresses.

Advancement. Some RNs start their careers as licensed practical nurses or nursing aides, and then go back to school to receive their RN degree. Most RNs begin as staff nurses in hospitals, and with experience and good performance often move to other settings or are promoted to more responsible positions. In management, nurses can advance from assistant unit manager or head nurse to more senior-level administrative roles of assistant director, director, vice president, or chief nurse. Increasingly, management-level nursing positions require a graduate or an advanced degree in nursing or health services administration. Administrative positions require leadership, communication and negotiation skills, and good judgment.

Some nurses move into the business side of health care. Their nursing expertise and experience on a health care team equip them to manage ambulatory, acute, home-based, and chronic care. Employers—including hospitals, insurance companies, pharmaceutical manufacturers, and managed care organizations, among others—need RNs for health planning and development, marketing, consulting, policy development, and quality assurance. Other nurses work as college and university faculty or conduct research.

Employment

As the largest health care occupation, registered nurses held about 2.5 million jobs in 2006. Hospitals employed the majority of RNs, with 59 percent of jobs. Other industries also employed large shares of workers. About 8 percent of jobs were in offices of physicians, 5 percent in home health care services, 5 percent in nursing care facilities, 4 percent in employment services, and 3 percent in outpatient care centers. The remainder worked mostly in government agencies, social assistance agencies, and educational services. About 21 percent of RNs worked part time.

Job Outlook

Overall job opportunities for registered nurses are expected to be excellent, but may vary by employment and geographic setting. Employment of RNs is expected to grow much faster than

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Registered nurses	29-1111	2,505,000	3,092,000	587,000	23

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

the average for all occupations through 2016 and, because the occupation is very large, many new jobs will result. In fact, registered nurses are projected to generate 587,000 new jobs, among the largest number of new jobs for any occupation. Additionally, hundreds of thousands of job openings will result from the need to replace experienced nurses who leave the occupation.

Employment change. Employment of registered nurses is expected to grow 23 percent from 2006 to 2016, much faster than the average for all occupations. Growth will be driven by technological advances in patient care, which permit a greater number of health problems to be treated, and by an increasing emphasis on preventive care. In addition, the number of older people, who are much more likely than younger people to need nursing care, is projected to grow rapidly.

However, employment of RNs will not grow at the same rate in every industry. The projected growth rates for RNs in the industries with the highest employment of these workers are:

	Percent
Offices of physicians.....	39
Home health care services	39
Outpatient care centers, except mental health and substance abuse	34
Employment services	27
General medical and surgical hospitals, public and private.....	22
Nursing care facilities	20

Employment is expected to grow more slowly in hospitals—health care’s largest industry—than in most other health care industries. While the intensity of nursing care is likely to increase, requiring more nurses per patient, the number of inpatients (those who remain in the hospital for more than 24 hours) is not likely to grow by much. Patients are being discharged earlier, and more procedures are being done on an outpatient basis, both inside and outside hospitals. Rapid growth is expected in hospital outpatient facilities, such as those providing same-day surgery, rehabilitation, and chemotherapy.

More and more sophisticated procedures, once performed only in hospitals, are being performed in physicians’ offices and in outpatient care centers, such as freestanding ambulatory surgical and emergency centers. Accordingly, employment is expected to grow very fast in these places as health care in general expands.

Employment in nursing care facilities is expected to grow because of increases in the number of elderly, many of whom require long-term care. However, this growth will be relatively slower than in other health care industries because of the desire of patients to be treated at home or in residential care facilities, and the increasing availability of that type of care. The financial pressure on hospitals to discharge patients as soon as possible should produce more admissions to nursing and residential care facilities and to home health care. Job growth also is expected in units that provide specialized long-term rehabilitation for stroke and head injury patients, as well as units that treat Alzheimer’s victims.

Employment in home health care is expected to increase rapidly in response to the growing number of older persons

with functional disabilities, consumer preference for care in the home, and technological advances that make it possible to bring increasingly complex treatments into the home. The type of care demanded will require nurses who are able to perform complex procedures.

Rapid employment growth in employment services industry is expected as hospitals, physician’s offices, and other health care establishments utilize temporary workers to fill short-term staffing needs. And as the demand for nurses grows, temporary nurses will be needed more often, further contributing to employment growth in this industry.

Job prospects. Overall job opportunities are expected to be excellent for registered nurses. Employers in some parts of the country and in certain employment settings report difficulty in attracting and retaining an adequate number of RNs, primarily because of an aging RN workforce and a lack of younger workers to fill positions. Enrollments in nursing programs at all levels have increased more rapidly in the past few years as students seek jobs with stable employment. However, many qualified applicants are being turned away because of a shortage of nursing faculty. The need for nursing faculty will only increase as many instructors near retirement. Many employers also are relying on foreign-educated nurses to fill vacant positions.

Even though overall employment opportunities for all nursing specialties are expected to be excellent, they can vary by employment setting. Despite the slower employment growth in hospitals, job opportunities should still be excellent because of the relatively high turnover of hospital nurses. RNs working in hospitals frequently work overtime and night and weekend shifts and also treat seriously ill and injured patients, all of which can contribute to stress and burnout. Hospital departments in which these working conditions occur most frequently—critical care units, emergency departments, and operating rooms—generally will have more job openings than other departments. To attract and retain qualified nurses, hospitals may offer signing bonuses, family-friendly work schedules, or subsidized training. A growing number of hospitals also are experimenting with online bidding to fill open shifts, in which nurses can volunteer to fill open shifts at premium wages. This can decrease the amount of mandatory overtime that nurses are required to work.

Although faster employment growth is projected in physicians’ offices and outpatient care centers, RNs may face greater competition for these positions because they generally offer regular working hours and more comfortable working environments. There also may be some competition for jobs in employment services, despite a high rate of employment growth, because a large number of workers are attracted by the industry’s relatively high wages and the flexibility of the work in this industry.

Generally, RNs with at least a bachelor’s degree will have better job prospects than those without a bachelor’s. In addition, all four advanced practice specialties—clinical nurse specialists, nurse practitioners, nurse-midwives, and nurse anesthetists—will be in high demand, particularly in medically underserved areas such as inner cities and rural areas. Relative to physicians, these RNs increasingly serve as lower-cost primary care providers.

Earnings

Median annual earnings of registered nurses were \$57,280 in May 2006. The middle 50 percent earned between \$47,710 and \$69,850. The lowest 10 percent earned less than \$40,250, and the highest 10 percent earned more than \$83,440. Median annual earnings in the industries employing the largest numbers of registered nurses in May 2006 were:

Employment services	\$64,260
General medical and surgical hospitals.....	58,550
Home health care services	54,190
Offices of physicians.....	53,800
Nursing care facilities	52,490

Many employers offer flexible work schedules, child care, educational benefits, and bonuses.

Related Occupations

Because of the number of specialties for registered nurses, and the variety of responsibilities and duties, many other health care occupations are similar in some aspect of the job. Other occupations that deal directly with patients when providing care include licensed practical and licensed vocational nurses, physicians and surgeons, athletic trainers, respiratory therapists, massage therapists, dietitians and nutritionists, occupational therapists, physical therapists, and emergency medical technicians and paramedics. Other occupations that use advanced medical equipment to treat patients include cardiovascular technologists and technicians, diagnostic medical sonographers, radiologic technologists and technicians, radiation therapists, and surgical technologists. Workers who also assist other health care professionals in providing care include nursing, psychiatric, and home health aides; physician assistants; and dental hygienists. Some nurses take on a management role, similar to medical and health services managers.

Sources of Additional Information

For information on a career as a registered nurse and nursing education, contact:

➤ National League for Nursing, 61 Broadway, New York, NY 10006. Internet: <http://www.nln.org>

For information on baccalaureate and graduate nursing education, nursing career options, and financial aid, contact:

➤ American Association of Colleges of Nursing, 1 Dupont Circle NW., Suite 530, Washington, DC 20036.

Internet: <http://www.aacn.nche.edu>

For additional information on registered nurses, including credentialing, contact:

➤ American Nurses Association, 8515 Georgia Ave., Suite 400, Silver Spring, MD 20910. Internet: <http://nursingworld.org>

For information on the NCLEX-RN exam and a list of individual State boards of nursing, contact:

➤ National Council of State Boards of Nursing, 111 E. Wacker Dr., Suite 2900, Chicago, IL 60611.

Internet: <http://www.ncsbn.org>

For information on the nursing population, including workforce shortage facts, contact:

➤ Bureau of Health Professions, 5600 Fishers LaNE., Room 8-05, Rockville, MD 20857. Internet: <http://bhpr.hrsa.gov>

For information on obtaining U.S. certification and work visas for foreign-educated nurses, contact:

➤ Commission on Graduates of Foreign Nursing Schools, 3600 Market St., Suite 400, Philadelphia, PA 19104.

Internet: <http://www.cgfn.org>

For a list of accredited clinical nurse specialist programs, contact:

➤ National Association of Clinical Nurse Specialists, 2090 Linglestown Rd., Suite 107, Harrisburg, PA 17110.

Internet: <http://www.nacns.org>

For information on nurse anesthetists, including a list of accredited programs, contact:

➤ American Association of Nurse Anesthetists, 222 Prospect Ave., Park Ridge, IL 60068.

For information on nurse-midwives, including a list of accredited programs, contact:

➤ American College of Nurse-Midwives, 8403 Colesville Rd., Suite 1550, Silver Spring, MD 20910.

Internet: <http://www.midwife.org>

For information on nurse practitioners, including a list of accredited programs, contact:

➤ American Academy of Nurse Practitioners, P.O. Box 12846, Austin, TX 78711. Internet: <http://www.aanp.org>

For information on nurse practitioners education, contact:

➤ National Organization of Nurse Practitioner Faculties, 1522 K St. NW., Suite 702, Washington, DC 20005.

Internet: <http://www.nonpf.org>

For information on critical care nurses, contact:

➤ American Association of Critical-Care Nurses, 101 Columbia, Aliso Viejo, CA 92656. Internet: <http://www.aacn.org>

For additional information on registered nurses in all fields and specialties, contact:

➤ American Society of Registered Nurses, 1001 Bridgeway, Suite 411, Sausalito, CA 94965. Internet: <http://www.asrn.org>

Respiratory Therapists

(O*NET 29-1126.00, 29-2054.00)

Significant Points

- Job opportunities should be very good.
- An associate degree is the minimum educational requirement, but a bachelor's or master's degree may be important for advancement.
- All States, except Alaska and Hawaii, require respiratory therapists to be licensed.
- Hospitals will account for the vast majority of job openings, but a growing number of openings will arise in other settings.

Nature of the Work

Respiratory therapists and respiratory therapy technicians—also known as respiratory care practitioners—evaluate, treat, and care for patients with breathing or other cardiopulmonary disorders. Practicing under the direction of a physician, respi-

ratory therapists assume primary responsibility for all respiratory care therapeutic treatments and diagnostic procedures, including the supervision of respiratory therapy technicians. Respiratory therapy technicians follow specific, well-defined respiratory care procedures under the direction of respiratory therapists and physicians.

In clinical practice, many of the daily duties of therapists and technicians overlap. However, therapists generally have greater responsibility than technicians. For example, respiratory therapists consult with physicians and other health care staff to help develop and modify patient care plans. Respiratory therapists also are more likely to provide complex therapy requiring considerable independent judgment, such as caring for patients on life support in intensive-care units of hospitals. In this *Handbook* statement, the term *respiratory therapist* includes both respiratory therapists and respiratory therapy technicians.

Respiratory therapists evaluate and treat all types of patients, ranging from premature infants whose lungs are not fully developed to elderly people whose lungs are diseased. Respiratory therapists provide temporary relief to patients with chronic asthma or emphysema, and they give emergency care to patients who are victims of a heart attack, stroke, drowning, or shock.

To evaluate patients, respiratory therapists interview them, perform limited physical examinations, and conduct diagnostic tests. For example, respiratory therapists test a patient's breathing capacity and determine the concentration of oxygen and other gases in a patient's blood. They also measure a patient's pH, which indicates the acidity or alkalinity of the blood. To evaluate a patient's lung capacity, respiratory therapists have the patient breathe into an instrument that measures the volume and flow of oxygen during inhalation and exhalation. By comparing the reading with the norm for the patient's age, height, weight, and sex, respiratory therapists can provide information that helps determine whether the patient has any lung deficiencies. To analyze oxygen, carbon dioxide, and blood pH levels, therapists draw an arterial blood sample, place it in a blood gas analyzer, and relay the results to a physician, who then makes treatment decisions.

To treat patients, respiratory therapists use oxygen or oxygen mixtures, chest physiotherapy, and aerosol medications—liquid medications suspended in a gas that forms a mist which is inhaled. They teach patients how to inhale the aerosol properly to ensure its effectiveness. When a patient has difficulty getting enough oxygen into his or her blood, therapists increase the patient's concentration of oxygen by placing an oxygen mask or nasal cannula on the patient and setting the oxygen flow at the level prescribed by a physician. Therapists also connect patients who cannot breathe on their own to ventilators that deliver pressurized oxygen into the lungs. The therapists insert a tube into the patient's trachea, or windpipe; connect the tube to the ventilator; and set the rate, volume, and oxygen concentration of the oxygen mixture entering the patient's lungs.

Therapists perform regular assessments of patients and equipment. If a patient appears to be having difficulty breathing or if the oxygen, carbon dioxide, or pH level of the blood is abnormal, therapists change the ventilator setting according

to the doctor's orders or check the equipment for mechanical problems.

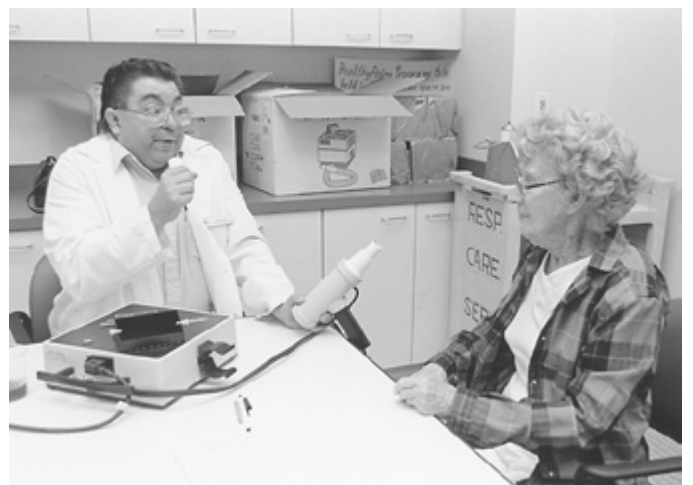
Respiratory therapists perform chest physiotherapy on patients to remove mucus from their lungs and make it easier for them to breathe. Therapists place patients in positions that help drain mucus, and then vibrate the patients' rib cages, often by tapping on the chest, and tell the patients to cough. Chest physiotherapy may be needed after surgery, for example, because anesthesia depresses respiration. As a result, physiotherapy may be prescribed to help get the patient's lungs back to normal and to prevent congestion. Chest physiotherapy also helps patients suffering from lung diseases, such as cystic fibrosis, that cause mucus to collect in the lungs.

Therapists who work in home care teach patients and their families to use ventilators and other life-support systems. In addition, these therapists visit patients in their homes to inspect and clean equipment, evaluate the home environment, and ensure that patients have sufficient knowledge of their diseases and the proper use of their medications and equipment. Therapists also make emergency visits if equipment problems arise.

In some hospitals, therapists perform tasks that fall outside their traditional role. Therapists are becoming involved in areas such as pulmonary rehabilitation, smoking cessation counseling, disease prevention, case management, and polysomnography—the diagnosis of breathing disorders during sleep, such as apnea. Respiratory therapists also increasingly treat critical care patients, either as part of surface and air transport teams or as part of rapid-response teams in hospitals.

Work environment. Respiratory therapists generally work between 35 and 40 hours a week. Because hospitals operate around the clock, therapists may work evenings, nights, or weekends. They spend long periods standing and walking between patients' rooms. In an emergency, therapists work under the stress of the situation. Respiratory therapists employed in home health care must travel frequently to patients' homes.

Respiratory therapists are trained to work with gases stored under pressure. Adherence to safety precautions and regular maintenance and testing of equipment minimize the risk of injury. As in many other health occupations, respiratory thera-



Respiratory therapists sometimes conduct diagnostic tests to evaluate patients.

pists are exposed to infectious diseases, but by carefully following proper procedures they can minimize the risks.

Training, Other Qualifications, and Advancement

An associate degree is the minimum educational requirement, but a bachelor’s or master’s degree may be important for advancement. All States, except Alaska and Hawaii, require respiratory therapists to be licensed.

Education and training. An associate degree is required to become a respiratory therapist. Training is offered at the post-secondary level by colleges and universities, medical schools, vocational-technical institutes, and the Armed Forces. Most programs award associate or bachelor’s degree and prepare graduates for jobs as advanced respiratory therapists. A limited number of associate degree programs lead to jobs as entry-level respiratory therapists. According to the Commission on Accreditation of Allied Health Education Programs (CAAHEP), 45 entry-level and 334 advanced respiratory therapy programs were accredited in the United States in 2006.

Among the areas of study in respiratory therapy programs are human anatomy and physiology, pathophysiology, chemistry, physics, microbiology, pharmacology, and mathematics. Other courses deal with therapeutic and diagnostic procedures and tests, equipment, patient assessment, cardiopulmonary resuscitation, the application of clinical practice guidelines, patient care outside of hospitals, cardiac and pulmonary rehabilitation, respiratory health promotion and disease prevention, and medical recordkeeping and reimbursement.

High school students interested in applying to respiratory therapy programs should take courses in health, biology, mathematics, chemistry, and physics. Respiratory care involves basic mathematical problem solving and an understanding of chemical and physical principles. For example, respiratory care workers must be able to compute dosages of medication and calculate gas concentrations.

Licensure and certification. A license is required to practice as a respiratory therapist, except in Alaska and Hawaii. Also, most employers require respiratory therapists to maintain a cardiopulmonary resuscitation (CPR) certification.

Licensure is usually based, in large part, on meeting the requirements for certification from the National Board for Respiratory Care (NBRC). The board offers the Certified Respiratory Therapist (CRT) credential to those who graduate from entry-level or advanced programs accredited by CAAHEP or the Committee on Accreditation for Respiratory Care (Co-ARC) and who also pass an exam.

The board also awards the Registered Respiratory Therapist (RRT) to CRTs who have graduated from advanced programs

and pass two separate examinations. Supervisory positions and intensive-care specialties usually require the RRT.

Other qualifications. Therapists should be sensitive to a patient’s physical and psychological needs. Respiratory care practitioners must pay attention to detail, follow instructions, and work as part of a team. In addition, operating advanced equipment requires proficiency with computers.

Advancement. Respiratory therapists advance in clinical practice by moving from general care to the care of critically ill patients who have significant problems in other organ systems, such as the heart or kidneys. Respiratory therapists, especially those with a bachelor’s or master’s degree, also may advance to supervisory or managerial positions in a respiratory therapy department. Respiratory therapists in home health care and equipment rental firms may become branch managers. Some respiratory therapists advance by moving into teaching positions. Some others use the knowledge gained as a respiratory therapist to work in another industry, such as developing, marketing, or selling pharmaceuticals and medical devices.

Employment

Respiratory therapists held about 122,000 jobs in 2006. About 79 percent of jobs were in hospitals, mainly in departments of respiratory care, anesthesiology, or pulmonary medicine. Most of the remaining jobs were in offices of physicians or other health practitioners, consumer-goods rental firms that supply respiratory equipment for home use, nursing care facilities, and home health care services. Holding a second job is relatively common for respiratory therapists. About 12 percent held another job, compared with 5 percent of workers in all occupations.

Job Outlook

Faster-than-average employment growth is projected for respiratory therapists. Job opportunities should be very good, especially for respiratory therapists with cardiopulmonary care skills or experience working with infants.

Employment change. Employment of respiratory therapists is expected to grow 19 percent from 2006 to 2016, faster than the average for all occupations. The increasing demand will come from substantial growth in the middle-aged and elderly population—a development that will heighten the incidence of cardiopulmonary disease. Growth in demand also will result from the expanding role of respiratory therapists in case management, disease prevention, emergency care, and the early detection of pulmonary disorders.

Older Americans suffer most from respiratory ailments and cardiopulmonary diseases such as pneumonia, chronic bronchitis, emphysema, and heart disease. As their numbers in-

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Respiratory therapists.....	—	122,000	145,000	23,000	19
Respiratory therapists.....	29-1126	102,000	126,000	23,000	23
Respiratory therapy technicians.....	29-2054	19,000	19,000	200	1

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

crease, the need for respiratory therapists is expected to increase as well. In addition, advances in inhalable medications and in the treatment of lung transplant patients, heart attack and accident victims, and premature infants (many of whom are dependent on a ventilator during part of their treatment) will increase the demand for the services of respiratory care practitioners.

Job prospects. Job opportunities are expected to be very good. The vast majority of job openings will continue to be in hospitals. However, a growing number of openings are expected to be outside of hospitals, especially in home health care services, offices of physicians or other health practitioners, consumer-goods rental firms, or in the employment services industry as a temporary worker in various settings.

Earnings

Median annual earnings of wage-and-salary respiratory therapists were \$47,420 in May 2006. The middle 50 percent earned between \$40,840 and \$56,160. The lowest 10 percent earned less than \$35,200, and the highest 10 percent earned more than \$64,190.

Median annual earnings of wage-and-salary respiratory therapy technicians were \$39,120 in May 2006. The middle 50 percent earned between \$32,050 and \$46,930. The lowest 10 percent earned less than \$25,940, and the highest 10 percent earned more than \$56,220.

Related Occupations

Under the supervision of a physician, respiratory therapists administer respiratory care and life support to patients with heart and lung difficulties. Other workers who care for, treat, or train people to improve their physical condition include registered nurses, occupational therapists, physical therapists, radiation therapists, and athletic trainers. Respiratory care practitioners work with advanced medical technology, as do other health care technicians including cardiovascular technologists and technicians, nuclear medicine technologists, radiologic technologists and technicians, and diagnostic medical sonographers.

Sources of Additional Information

Information concerning a career in respiratory care is available from:

➤ American Association for Respiratory Care, 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063.

Internet: <http://www.aarc.org>

For a list of accredited educational programs for respiratory care practitioners, contact either of the following organizations:

➤ Commission on Accreditation for Allied Health Education Programs, 1361 Park St., Clearwater, FL 33756.

Internet: <http://www.caahep.org>

➤ Committee on Accreditation for Respiratory Care, 1248 Harwood Rd., Bedford, TX 76021.

Information on gaining credentials in respiratory care and a list of State licensing agencies can be obtained from:

➤ National Board for Respiratory Care, Inc., 18000 W. 105th St., Olathe, KS 66061. Internet: <http://www.nbrc.org>

Speech-Language Pathologists

(O*NET 29-1127.00)

Significant Points

- About half worked in educational services; most others were employed by health care and social assistance facilities.
- A master's degree in speech-language pathology is the standard credential required for licensing in most States.
- Excellent job opportunities are expected.

Nature of the Work

Speech-language pathologists, sometimes called *speech therapists*, assess, diagnose, treat, and help to prevent disorders related to speech, language, cognitive-communication, voice, swallowing, and fluency.

Speech-language pathologists work with people who cannot produce speech sounds or cannot produce them clearly; those with speech rhythm and fluency problems, such as stuttering; people with voice disorders, such as inappropriate pitch or harsh voice; those with problems understanding and producing language; those who wish to improve their communication skills by modifying an accent; and those with cognitive communication impairments, such as attention, memory, and problem solving disorders. They also work with people who have swallowing difficulties.

Speech, language, and swallowing difficulties can result from a variety of causes including stroke, brain injury or deterioration, developmental delays or disorders, learning disabilities, cerebral palsy, cleft palate, voice pathology, mental retardation, hearing loss, or emotional problems. Problems can be congenital, developmental, or acquired. Speech-language pathologists use special instruments and qualitative and quantitative assessment methods, including standardized tests, to analyze and diagnose the nature and extent of impairments.

Speech-language pathologists develop an individualized plan of care, tailored to each patient's needs. For individuals with little or no speech capability, speech-language pathologists may select augmentative or alternative communication methods, including automated devices and sign language, and teach their use. They teach patients how to make sounds, improve their voices, or increase their oral or written language skills to communicate more effectively. They also teach individuals how to strengthen muscles or use compensatory strategies to swallow without choking or inhaling food or liquid. Speech-language pathologists help patients develop, or recover, reliable communication and swallowing skills so patients can fulfill their educational, vocational, and social roles.

Speech-language pathologists keep records on the initial evaluation, progress, and discharge of clients. This helps pinpoint problems, tracks client progress, and justifies the cost of treatment when applying for reimbursement. They counsel individuals and their families concerning communication disor-



Speech-language pathologists tailor a plan of care for each patient.

ders and how to cope with the stress and misunderstanding that often accompany them. They also work with family members to recognize and change behavior patterns that impede communication and treatment and show them communication-enhancing techniques to use at home.

Most speech-language pathologists provide direct clinical services to individuals with communication or swallowing disorders. In medical facilities, they may perform their job in conjunction with physicians, social workers, psychologists, and other therapists. Speech-language pathologists in schools collaborate with teachers, special educators, interpreters, other school personnel, and parents to develop and implement individual or group programs, provide counseling, and support classroom activities.

Some speech-language pathologists conduct research on how people communicate. Others design and develop equipment or techniques for diagnosing and treating speech problems.

Work environment. Speech-language pathologists usually work at a desk or table in clean comfortable surroundings. In medical settings, they may work at the patient's bedside and assist in positioning the patient. In schools, they may work with students in an office or classroom. Some work in the client's home.

Although the work is not physically demanding, it requires attention to detail and intense concentration. The emotional needs of clients and their families may be demanding. Most full-time speech-language pathologists work 40 hours per week. Those who work on a contract basis may spend a substantial amount of time traveling between facilities.

Training, Other Qualifications, and Advancement

A master's degree is the most common level of education among speech-language pathologists. Licensure or certification requirements also exist, but vary by State.

Education and training. Most speech-language pathologist jobs require a master's degree. In 2007, more than 230 colleges and universities offered graduate programs in speech-language pathology accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology. While graduation from an accredited program is not always

required to become a speech-language pathologist, it may be helpful in obtaining a license or may be required to obtain a license in some States.

Speech-language pathology courses cover anatomy, physiology, and the development of the areas of the body involved in speech, language, and swallowing; the nature of disorders; principles of acoustics; and psychological aspects of communication. Graduate students also learn to evaluate and treat speech, language, and swallowing disorders and receive supervised clinical training in communication disorders.

Licensure and certification. In 2007, 47 States regulated speech-language pathologists through licensure or registration. A passing score on the national examination on speech-language pathology, offered through the Praxis Series of the Educational Testing Service, is required. Other usual requirements include 300 to 375 hours of supervised clinical experience and 9 months of postgraduate professional clinical experience. Forty-one States have continuing education requirements for licensure renewal. Medicaid, Medicare, and private health insurers generally require a practitioner to be licensed to qualify for reimbursement.

Only 12 States require this same license to practice in the public schools. The other States issue a teaching license or certificate that typically requires a master's degree from an approved college or university. Some States will grant a provisional teaching license or certificate to applicants with a bachelor's degree, but a master's degree must be earned within 3 to 5 years. A few States grant a full teacher's certificate or license to bachelor's degree applicants.

In some States, the Certificate of Clinical Competence in Speech-Language Pathology (CCC-SLP) offered by the American Speech-Language-Hearing Association meets some or all of the requirements for licensure. To earn a CCC, a person must have a graduate degree from an accredited university, 400 hours of supervised clinical experience, complete a 36-week postgraduate clinical fellowship, and pass the Praxis Series examination in speech-language pathology administered by the Educational Testing Service. Contact your State's Licensing Board for details on your State's requirements.

Other qualifications. Speech-language pathologists should be able to effectively communicate diagnostic test results, diagnoses, and proposed treatment in a manner easily understood by their patients and their families. They must be able to approach problems objectively and be supportive. Because a patient's progress may be slow, patience, compassion, and good listening skills are necessary.

Advancement. As speech-language pathologists gain clinical experience and engage in continuing professional education, many develop expertise with certain populations, such as preschoolers and adolescents, or disorders, such as aphasia and learning disabilities. Some may obtain board recognition in a specialty area, such as child language, fluency, or feeding and swallowing. Experienced clinicians may become mentors or supervisors of other therapists or be promoted to administrative positions.

Employment

Speech-language pathologists held about 110,000 jobs in 2006. About half were employed in educational services, primarily in

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Speech-language pathologists.....	29-1127	110,000	121,000	12,000	11

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

preschools and elementary and secondary schools. Others were employed in hospitals; offices of other health practitioners, including speech-language pathologists; nursing care facilities; home health care services; individual and family services; outpatient care centers; and child day care centers.

A few speech-language pathologists are self-employed in private practice. They contract to provide services in schools, offices of physicians, hospitals, or nursing care facilities, or work as consultants to industry.

Job Outlook

Average employment growth is projected. Job opportunities are expected to be excellent.

Employment change. Employment of speech-language pathologists is expected to grow 11 percent from 2006 to 2016, about as fast as the average for all occupations. As the members of the baby boom generation continue to age, the possibility of neurological disorders and associated speech, language, and swallowing impairments increases. Medical advances also are improving the survival rate of premature infants and trauma and stroke victims, who then need assessment and sometimes treatment.

Employment in educational services will increase with the growth in elementary and secondary school enrollments, including enrollment of special education students. Federal law guarantees special education and related services to all eligible children with disabilities. Greater awareness of the importance of early identification and diagnosis of speech and language disorders in young children will also increase employment.

In health care facilities, restrictions on reimbursement for therapy services may limit the growth of speech-language pathologist jobs in the near term. However, the long-run demand for therapists should continue to rise as growth in the number of individuals with disabilities or limited function spurs demand for therapy services.

The number of speech-language pathologists in private practice will rise because of the increasing use of contract services by hospitals, schools, and nursing care facilities.

Job prospects. The combination of growth in the occupation and an expected increase in retirements over the coming years should create excellent job opportunities for speech-language pathologists. Opportunities should be particularly favorable for those with the ability to speak a second language, such as Spanish. Job prospects also are expected to be especially favorable for those who are willing to relocate, particularly to areas experiencing difficulty in attracting and hiring speech-language pathologists.

Earnings

Median annual earnings of wage-and-salary speech-language pathologists were \$57,710 in May 2006. The middle 50 percent

earned between \$46,360 and \$72,410. The lowest 10 percent earned less than \$37,970, and the highest 10 percent earned more than \$90,400. Median annual earnings in the industries employing the largest numbers of speech-language pathologists were:

Nursing care facilities	\$70,180
Offices of other health practitioners.....	63,240
General medical and surgical hospitals.....	61,970
Elementary and secondary schools	53,110

Some employers may reimburse speech-language pathologists for their required continuing education credits.

Related Occupations

Speech-language pathologists specialize in the prevention, diagnosis, and treatment of speech and language problems. Workers in related occupations include audiologists, occupational therapists, optometrists, physical therapists, psychologists, and recreational therapists. Speech-language pathologists in school systems often work closely with special education teachers in assisting students with disabilities.

Sources of Additional Information

State licensing boards can provide information on licensure requirements. State departments of education can supply information on certification requirements for those who wish to work in public schools.

For information on careers in speech-language pathology, a description of the CCC-SLP credential, and a listing of accredited graduate programs in speech-language pathology, contact:

- American Speech-Language-Hearing Association, 10801 Rockville Pike, Rockville, MD 20852.
- Internet: <http://www.asha.org>

Veterinarians

(O*NET 29-1131.00)

Significant Points

- Veterinarians should have an affinity for animals and the ability to get along with their owners.
- Graduation from an accredited college of veterinary medicine and a State license are required.
- Competition for admission to veterinary school is keen; however, graduates should have excellent job opportunities.
- About 3 out of 4 veterinarians work in private practice.

Nature of the Work

Veterinarians care for the health of pets, livestock, and animals in zoos, racetracks, and laboratories. Some veterinarians use their skills to protect humans against diseases carried by animals and conduct clinical research on human and animal health problems. Others work in basic research, broadening our knowledge of animals and medical science, and in applied research, developing new ways to use knowledge.

Most veterinarians diagnose animal health problems; vaccinate against diseases, such as distemper and rabies; medicate animals suffering from infections or illnesses; treat and dress wounds; set fractures; perform surgery; and advise owners about animal feeding, behavior, and breeding.

According to the American Medical Veterinary Association, more than 70 percent of veterinarians who work in private medical practices predominately, or exclusively, treat small animals. Small-animal practitioners usually care for companion animals, such as dogs and cats, but also treat birds, reptiles, rabbits, ferrets, and other animals that can be kept as pets. About one-fourth of all veterinarians work in mixed animal practices, where they see pigs, goats, cattle, sheep, and some wild animals in addition to companion animals.

A small number of private-practice veterinarians work exclusively with large animals, mostly horses or cattle; some also care for various kinds of food animals. These veterinarians usually drive to farms or ranches to provide veterinary services for herds or individual animals. Much of this work involves preventive care to maintain the health of the animals. These veterinarians test for and vaccinate against diseases and consult with farm or ranch owners and managers regarding animal production, feeding, and housing issues. They also treat and dress wounds, set fractures, and perform surgery, including cesarean sections on birthing animals. Other veterinarians care for zoo, aquarium, or laboratory animals. Veterinarians of all types euthanize animals when necessary.

Veterinarians who treat animals use medical equipment such as stethoscopes, surgical instruments, and diagnostic equipment, including radiographic and ultrasound equipment. Veterinarians working in research use a full range of sophisticated laboratory equipment.

Veterinarians contribute to human as well as animal health. A number of veterinarians work with physicians and scientists as they research ways to prevent and treat various human health problems. For example, veterinarians contributed greatly in conquering malaria and yellow fever, solved the mystery of botulism, produced an anticoagulant used to treat some people with heart disease, and defined and developed surgical techniques for humans, such as hip and knee joint replacements and limb and organ transplants. Today, some determine the effects of drug therapies, antibiotics, or new surgical techniques by testing them on animals.

Some veterinarians are involved in food safety and inspection. Veterinarians who are livestock inspectors, for example, check animals for transmissible diseases, such as *E. coli*, advise owners on the treatment of their animals, and may quarantine animals. Veterinarians who are meat, poultry, or egg product inspectors examine slaughtering and processing plants, check live animals and carcasses for disease, and enforce gov-



Most veterinarians perform clinical work in private practices on small animals.

ernment regulations regarding food purity and sanitation. More veterinarians are finding opportunities in food security as they ensure that the Nation has abundant and safe food supplies. Veterinarians involved in food security often work along the Nation's borders as animal and plant health inspectors, where they examine imports and exports of animal products to prevent disease here and in foreign countries. Many of these workers are employed by the Department of Homeland Security or the Department of Agriculture's Animal and Plant Health Inspection Service division.

Work environment. Veterinarians in private or clinical practice often work long hours in a noisy indoor environment. Sometimes they have to deal with emotional or demanding pet owners. When working with animals that are frightened or in pain, veterinarians risk being bitten, kicked, or scratched.

Veterinarians in large-animal practice spend time driving between their office and farms or ranches. They work outdoors in all kinds of weather and may have to treat animals or perform surgery, under unsanitary conditions.

Veterinarians working in nonclinical areas, such as public health and research, have working conditions similar to those of other professionals in those lines of work. These veterinarians enjoy clean, well-lit offices or laboratories and spend much of their time dealing with people rather than animals.

Veterinarians often work long hours. Those in group practices may take turns being on call for evening, night, or weekend work; solo practitioners may work extended and weekend hours, responding to emergencies or squeezing in unexpected appointments.

Training, Other Qualifications, and Advancement

Veterinarians must obtain a Doctor of Veterinary Medicine degree and a State license. There is keen competition for admission to veterinary school.

Education and training. Prospective veterinarians must graduate with a Doctor of Veterinary Medicine (D.V.M. or V.M.D.) degree from a 4-year program at an accredited college of veterinary medicine. There are 28 colleges in 26 States that meet accreditation standards set by the Council on Education of the American Veterinary Medical Association (AVMA).

The prerequisites for admission to veterinary programs vary. Many programs do not require a bachelor's degree for entrance,

but all require a significant number of credit hours—ranging from 45 to 90 semester hours—at the undergraduate level. However, most of the students admitted have completed an undergraduate program and earned a bachelor's degree. Applicants without a degree face a difficult task gaining admittance.

Preveterinary courses should emphasize the sciences. Veterinary medical colleges typically require applicants to have taken classes in organic and inorganic chemistry, physics, biochemistry, general biology, animal biology, animal nutrition, genetics, vertebrate embryology, cellular biology, microbiology, zoology, and systemic physiology. Some programs require calculus; some require only statistics, college algebra and trigonometry, or pre-calculus. Most veterinary medical colleges also require some courses in English or literature, other humanities, and the social sciences. Increasingly, courses in general business management and career development have become a standard part of the curriculum to teach new graduates how to effectively run a practice.

In addition to satisfying preveterinary course requirements, applicants must submit test scores from the Graduate Record Examination (GRE), the Veterinary College Admission Test (VCAT), or the Medical College Admission Test (MCAT), depending on the preference of the college to which they are applying. Currently, 22 schools require the GRE, 4 require the VCAT, and 2 accept the MCAT.

There is keen competition for admission to veterinary school. The number of accredited veterinary colleges has remained largely the same since 1983, but the number of applicants has risen significantly. Only about 1 in 3 applicants was accepted in 2005.

New graduates with a Doctor of Veterinary Medicine degree may begin to practice veterinary medicine once they receive their license, but many new graduates choose to enter a 1-year internship. Interns receive a small salary but often find that their internship experience leads to better paying opportunities later, relative to those of other veterinarians. Veterinarians who then seek board certification also must complete a 3- to 4-year residency program that provides intensive training in one of the 20 AVMA-recognized veterinary specialties including internal medicine, oncology, pathology, dentistry, nutrition, radiology, surgery, dermatology, anesthesiology, neurology, cardiology, ophthalmology, preventive medicine, and exotic small-animal medicine.

Licensure. All States and the District of Columbia require that veterinarians be licensed before they can practice. The only exemptions are for veterinarians working for some Federal agencies and some State governments. Licensing is controlled by the States and is not strictly uniform, although all States require the successful completion of the D.V.M. degree—or equivalent education—and a passing grade on a national board examination, the North American Veterinary Licensing Exam. This 8-hour examination consists of 360 multiple-choice questions covering all aspects of veterinary medicine as well as visual materials designed to test diagnostic skills.

The Educational Commission for Foreign Veterinary Graduates grants certification to individuals trained outside the United States who demonstrate that they meet specified requirements for English language and clinical proficiency. This certification fulfills the educational requirement for licensure in all States.

Most States also require candidates to pass a State jurisprudence examination covering State laws and regulations. Some States do additional testing on clinical competency as well. There are few reciprocal agreements between States, veterinarians who wish to practice in a different State usually must first pass that State's examinations.

Other qualifications. When deciding whom to admit, some veterinary medical colleges place heavy consideration on a candidate's veterinary and animal experience. Formal experience, such as work with veterinarians or scientists in clinics, agribusiness, research, or some area of health science, is particularly advantageous. Less formal experience, such as working with animals on a farm or ranch or at a stable or animal shelter, also can be helpful. Students must demonstrate ambition and an eagerness to work with animals.

Prospective veterinarians must have good manual dexterity. They should have an affinity for animals and the ability to get along with their owners, especially pet owners, who usually have strong bonds with their pets. Veterinarians who intend to go into private practice should possess excellent communication and business skills, because they will need to manage their practice and employees successfully and to promote, market, and sell their services.

Advancement. Most veterinarians begin as employees in established group practices. Despite the substantial financial investment in equipment, office space, and staff, many veterinarians with experience eventually set up their own practice or purchase an established one.

Newly trained veterinarians can become U.S. Government meat and poultry inspectors, disease-control workers, animal welfare and safety workers, epidemiologists, research assistants, or commissioned officers in the U.S. Public Health Service or various branches of the U.S. Armed Forces. A State license may be required.

Nearly all States have continuing education requirements for licensed veterinarians. Requirements differ by State and may involve attending a class or otherwise demonstrating knowledge of recent medical and veterinary advances.

Employment

Veterinarians held about 62,000 jobs in 2006. According to the American Veterinary Medical Association, about 3 out of 4 veterinarians were employed in a solo or group practice. Most others were salaried employees of another veterinary practice. Data from the U.S. Bureau of Labor Statistics show that the Federal Government employed about 1,400 civilian veterinarians, chiefly in the U.S. Departments of Agriculture, Health and Human Services, and, increasingly, Homeland Security. Other employers of veterinarians are State and local governments, colleges of veterinary medicine, medical schools, research laboratories, animal food companies, and pharmaceutical companies. A few veterinarians work for zoos, but most veterinarians caring for zoo animals are private practitioners who contract with the zoos to provide services, usually on a part-time basis.

In addition, many veterinarians hold veterinary faculty positions in colleges and universities and are classified as teachers. (See the statement on teachers—postsecondary elsewhere in the *Handbook*.)

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Veterinarians	29-1131	62,000	84,000	22,000	35

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

Job Outlook

Employment is expected to increase much faster than average. Excellent job opportunities are expected.

Employment change. Employment of veterinarians is expected to increase 35 percent over the 2006-16 decade, much faster than the average for all occupations. Veterinarians usually practice in animal hospitals or clinics and care primarily for companion animals. Recent trends indicate particularly strong interest in cats as pets. Faster growth of the cat population is expected to increase the demand for feline medicine and veterinary services, while demand for veterinary care for dogs should continue to grow at a more modest pace.

Many pet owners are relatively affluent and consider their pets a member of the family. These owners are becoming more aware of the availability of advanced care and are more willing to pay for intensive veterinary care than owners in the past. Furthermore, the number of pet owners purchasing pet insurance is rising, increasing the likelihood that considerable money will be spent on veterinary care.

More pet owners also will take advantage of nontraditional veterinary services, such as cancer treatment and preventive dental care. Modern veterinary services have caught up to human medicine; certain procedures, such as hip replacement, kidney transplants, and blood transfusions, which were once only available for humans, are now available for animals.

Continued support for public health and food and animal safety, national disease control programs, and biomedical research on human health problems will contribute to the demand for veterinarians, although the number of positions in these areas is limited. Homeland security also may provide opportunities for veterinarians involved in efforts to maintain abundant food supplies and minimize animal diseases in the U.S. and in foreign countries.

Job prospects. Excellent job opportunities are expected because there are only 28 accredited schools of veterinary medicine in the United States, resulting in a limited number of graduates—about 2,700—each year. However, applicants face keen competition for admission to veterinary school.

New graduates continue to be attracted to companion-animal medicine because they prefer to deal with pets and to live and work near heavily populated areas, where most pet owners live. Employment opportunities are good in cities and suburbs, but even better in rural areas because fewer veterinarians compete to work there.

Beginning veterinarians may take positions requiring evening or weekend work to accommodate the extended hours of operation that many practices are offering. Some veterinarians take salaried positions in retail stores offering veterinary services. Self-employed veterinarians usually have to work hard and long to build a sufficient client base.

The number of jobs for large-animal veterinarians is likely to grow more slowly than jobs for companion-animal veterinarians. Nevertheless, job prospects should be better for veterinarians who specialize in farm animals because of lower earnings in the farm-animal specialty and because many veterinarians do not want to work in rural or isolated areas.

Veterinarians with training in food safety and security, animal health and welfare, and public health and epidemiology should have the best opportunities for a career in the Federal Government.

Earnings

Median annual earnings of veterinarians were \$71,990 in May 2006. The middle 50 percent earned between \$56,450 and \$94,880. The lowest 10 percent earned less than \$43,530, and the highest 10 percent earned more than \$133,150.

The average annual salary for veterinarians in the Federal Government was \$84,335 in 2007.

According to a survey by the American Veterinary Medical Association, average starting salaries of veterinary medical college graduates in 2006 varied by type of practice as follows:

Large animals, exclusively	\$61,029
Small animals, predominantly	57,117
Small animals, exclusively	56,241
Private clinical practice	55,031
Large animals, predominantly	53,397
Mixed animals	52,254
Equine (horses)	40,130

Related Occupations

Veterinarians prevent, diagnose, and treat diseases, disorders, and injuries in animals. Those who do similar work for humans include chiropractors, dentists, optometrists, physicians and surgeons, and podiatrists. Veterinarians have extensive training in physical and life sciences, and some do scientific and medical research, as do biological scientists and medical scientists.

Animal care and service workers and veterinary technologists and technicians also work extensively with animals. Like veterinarians, they must have patience and feel comfortable with animals. However, the level of training required for these occupations is substantially less than that needed by veterinarians.

Sources of Additional Information

For additional information on careers in veterinary medicine, a list of U.S. schools and colleges of veterinary medicine, and accreditation policies, send a letter-size, self-addressed, stamped envelope to:

- American Veterinary Medical Association, 1931 N. Meacham Rd., Suite 100, Schaumburg, IL 60173.
- Internet: <http://www.avma.org>

For information on veterinary education, contact:

- Association of American Veterinary Medical Colleges, 1101 Vermont Ave. NW., Suite 301, Washington, DC 20005.

Internet: <http://www.aavmc.org>

For information on scholarships, grants, and loans, contact the financial aid officer at the veterinary schools to which you wish to apply.

For information on veterinarians working in zoos, see the Occupational Outlook Quarterly article “Wild jobs with wildlife,” online at:

<http://www.bls.gov/opub/ooq/2001/spring/art01.pdf>.

Information on obtaining a veterinary position with the Federal Government is available from the Office of Personnel Management through USAJOBS, the Federal Government’s official employment information system. This resource for locating and applying for job opportunities can be accessed through the Internet at <http://www.usajobs.opm.gov> or through an interactive voice response telephone system at (703) 724-1850 or TDD (978) 461-8404. These numbers are not toll free, and charges may result. For advice on how to find and apply for Federal jobs, see the Occupational Outlook Quarterly article “How to get a job in the Federal Government,” online at:

<http://www.bls.gov/opub/ooq/2004/summer/art01.pdf>