Audiologists

(O*NET 29-1121.00)

**Significant Points**

- Employment growth will be spurred by the expanding population in older age groups that are prone to medical conditions that result in hearing problems.
- More than half worked in health care facilities; many others were employed by educational services.
- A master’s degree in audiology has been the standard credential; however, a clinical doctoral degree is becoming more common for new entrants and is expected to become the new standard for the profession.

**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 in 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 (hearing) 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, from birth to old age. 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 levels in workplaces and conduct hearing protection programs in factories, as well as 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.

**Working Conditions**

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**

Audiologists are regulated in 49 States; all require that individuals have at least a master’s degree in audiology. However, a clinical doctoral degree is expected to become the new standard, and several States are currently in the process of changing their regulations to require the Doctor of Audiology (Au.D.) degree or equivalent. A passing score on the national examination on audiology offered through the Praxis Series of the Educational Testing Service also is needed. Other requirements typically are 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. An additional examination and license is required in order to dispense hearing aids in some States. Medicaid, Medicare, and private health insurers generally require practitioners to be licensed to qualify for reimbursement.

In 2005, there were 24 master’s degree programs and 62 clinical doctoral programs offered at accredited colleges and universities. Graduation from an accredited program may be required to obtain a license. Requirements for admission to programs in audiology include courses in English, mathematics, physics, chemistry, biology, psychology, and communication. Graduate course work 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.

Audiologists can acquire the Certificate of Clinical Competence in Audiology (CCC-A) offered by the American Speech-Language-Hearing Association. To earn a CCC, a person must have a graduate degree and 375 hours of supervised clinical experience, complete a 36-week postgraduate clinical fellowship, and pass the Praxis Series examination in audiology, administered.
by the Educational Testing Service. According to the American Speech-Language-Hearing Association, as of 2007, audiologists will need to have a bachelor’s degree and complete 75 hours of credit toward a doctoral degree in order to seek certification. As of 2012, audiologists will have to earn a doctoral degree in order to be certified.

Audiologists may also be certified through the American Board of Audiology. Applicants must earn a master’s or doctoral degree in audiology from a regionally accredited college or university, achieve a passing score on a national examination in audiology, and demonstrate that they have completed a minimum of 2,000 hours of mentored professional practice in a two-year period with a qualified audiologist. Certificants must apply for renewal every three years. They must demonstrate that they have earned 45 hours of approved continuing education within the three-year period. Beginning in 2007, all applicants must earn a doctoral degree in audiology.

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.

Employment
Audiologists held about 10,000 jobs in 2004. More than half of all jobs were in offices of physicians or other health practitioners, including audiologists; in hospitals; and in outpatient care centers. About 1 in 7 jobs was 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
Employment of audiologists is expected to grow about as fast as the average for all occupations through the year 2014. Because hearing loss is strongly associated with aging, rapid growth in older population groups will cause the number of persons with hearing and balance impairments to increase markedly. Medical advances are also improving the survival rate of premature infants and trauma victims, who then need assessment and possible treatment. Greater awareness of the importance of early identification and diagnosis of hearing disorders in infants also will increase employment. Most States now require that all 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. The number of audiologists in private practice will rise due to the increasing demand for direct services to individuals as well as increasing use of contract services by hospitals, schools, and nursing care facilities.

Growth in employment of audiologists will be moderated by limitations on insurance reimbursements for the services they provide. Additionally, increased educational requirements may limit the pool of workers entering the profession and any resulting higher salaries may cause doctors to hire more lower paid ear technicians to perform the functions that audiologists held in doctor’s offices. Only a few job openings for audiologists will arise from the need to replace those who leave the occupation, because the occupation is small.

Earnings
Median annual earnings of audiologists were $51,470 in May 2004. The middle 50 percent earned between $42,160 and $62,210. The lowest 10 percent earned less than $34,990, and the highest 10 percent earned more than $75,990.

According to a 2004 survey by the American Speech-Language-Hearing Association, the median annual salary for full-time certified audiologists who worked on a calendar-year basis, generally 11 or 12 months annually, was $56,000. For those who worked on an academic-year basis, usually 9 or 10 months annually, the median annual salary was $53,000. The median starting salary for certified audiologists with one to three years of experience was $45,000 on a calendar-year basis.

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.

General information on careers in audiology is available from:
➤ American Academy of Audiology, 11730 Plaza America Dr., Suite 300, Reston, VA 20190. Internet: http://www.audiology.org

Career information, a description of the CCC-A credential, and a listing of accredited graduate programs, is available from:

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

Chiropractors
(O*NET 29-1011.00)

Significant Points
▪ Job prospects should be good; employment is expected to increase faster than average as consumer demand for alternative health care grows.
▪ 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 58 percent of chiropractors are 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 whose health problems are associated with the body’s muscular, nervous, and skeletal systems, especially the spine. Chiropractors believe that interference with these systems impairs the body’s normal functions and lowers its resistance to disease. They also hold that spinal or vertebral dysfunction alters many important body functions by affecting the nervous system and that skeletal imbalance through joint or articular dysfunction, especially in the spine, can cause pain.

The chiropractic approach to health care is holistic, stressing the patient’s overall health and wellness. It recognizes that many factors affect health, including exercise, diet, rest, environment, and heredity. Chiropractors provide natural, drugless, nonsurgical health treatments and rely on the body’s inherent recuperative abilities. They also recommend changes in lifestyle—in eating, exercise, and sleeping habits, for example—to their patients. When appropriate, chiropractors consult with and refer patients to other health practitioners.

Like other health practitioners, chiropractors follow a standard routine to secure the information they need for diagnosis and treatment. 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 employ a postural and spinal analysis common to chiropractic diagnosis.

In cases in which difficulties can be traced to the involvement of musculoskeletal structures, chiropractors manually adjust the spinal column. Some chiropractors use water, light, massage, ultrasound, electric, acupuncture, and heat therapy. They also may apply supports such as straps, tapes, and braces. Chiropractors counsel patients about wellness concepts such as nutrition, exercise, changes in lifestyle, and stress management, but do not prescribe drugs or perform surgery.

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.

Working Conditions
Chiropractors work in clean, comfortable offices. Their average workweek is about 40 hours, although longer hours are not uncommon. Solo practitioners set their own hours, but may work evenings or weekends to accommodate patients.

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.

Training, Other Qualifications, and Advancement
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 permitting 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 boards require at least 2 years of undergraduate education; 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.

In 2005, 15 chiropractic programs and 2 chiropractic institutions in the United States were accredited by the Council on Chiropractic Education. Applicants are required to 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 State boards.

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 basic science subjects such as anatomy, physiology, public health, microbiology, pathology, and biochemistry. The last 2
years stress 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.

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.

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 2004. Approximately 58 percent of chiropractors are self-employed. Most chiropractors are in 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.

Many chiropractors are located in small communities. However, there still often are geographic imbalances in the distribution of chiropractors, in part because many establish practices close to one of the few chiropractic institutions.

Job Outlook
Job prospects are expected to be good for persons who enter the practice of chiropractic. Employment of chiropractors is expected to grow faster than the average for all occupations through the year 2014 as consumer demand for alternative health care grows. 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 as well 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. Increasingly, chiropractors must educate communities about the benefits of chiropractic care in order to establish a successful practice.

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 $69,910 in May 2004. The middle 50 percent earned between $46,710 and $118,280 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. Self-employed chiropractors must provide 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:


➤ World Chiropractic Alliance, 2950 N. Dobson Rd., Suite 1, Chandler, AZ 85224.

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


For information on State education and licensure requirements, contact:


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

➤ National Board of Chiropractic Examiners, 901 54th Ave., Suite 101, 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.

● Employment is projected to grow about as fast as average, and most job 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, prevent, and treat problems with teeth or mouth tissue. They remove 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 provide instruction on diet, brushing, flossing, the use of fluorides, and other aspects of dental care. They also administer anesthetics and write prescriptions for antibiotics and other medications.

Dentists use a variety of equipment, including x-ray machines; drills; and instruments such as 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 buying 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).

Working Conditions
Most dentists work 4 or 5 days a week. Some work evenings and weekends to meet their patients’ needs. Most full-time dentists work between 35 and 40 hours a week, but others work more. Initially, dentists may work more hours as they establish their practice. Experienced dentists often work fewer hours. Many continue in part-time practice well beyond the usual retirement age.

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.

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 one of the 56 dental schools accredited by the American Dental Association’s (ADA’s) Commission on Dental Accreditation in 2004, and then must pass written and practical examinations. 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.

Dental schools require a minimum of 2 years of college-level pre-dental education, regardless of the major chosen. However, most dental students have at least a bachelor’s degree. Pre-dental education emphasizes coursework in science, and many applicants to dental school major in a science such as biology or chemistry, while other applicants major in another subject and take many science courses as well. 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.

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 basic sciences, including anatomy, microbiology, biochemistry, and physiology. Beginning courses in clinical sciences, including laboratory techniques, also are provided at this time. 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). The rest 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.

In 2004, 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. 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. According to the ADA, each year about 12 percent of new graduates enroll in postgraduate training programs to prepare for a dental specialty.

Dentistry requires diagnostic ability and manual skills. Dentists should have good visual memory, excellent judgment regarding space and shape, 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. High school and college students who want to become dentists should take courses in biology, chemistry, physics, health, and mathematics.

Employment
Dentists held about 150,000 jobs in 2004. Employment was distributed among general practitioners and specialists as follows:

Dentists, general.................................................................................. 128,000
Orthodontists.................................................................................. 10,000
Oral and maxillofacial surgeons....................................................... 6,000
Prosthodontists................................................................................. 1,000
Dentists, all other specialists............................................................. 5,000

About one third of dentists were self-employed and not incorporated. Almost all dentists work in private practice. According to ADA, 78 percent of dentists in private practice are sole proprietors, and 14 percent belong to a partnership. A few salaried dentists work in hospitals and offices of physicians.
**Job Outlook**
Employment of dentists is projected to grow about as fast as the average for all occupations through 2014. Although employment growth will provide some job opportunities, most jobs 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.

Demand for dental care should grow substantially through 2014. 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 younger generation will continue to need preventive checkups despite treatments such as fluoridation of the water supply, which decreases the incidence of tooth decay. However, employment of dentists is not expected to grow as rapidly as the demand for dental services. As their practices expand, dentists are likely to hire more dental 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.

**Earnings**
Median annual earnings of salaried dentists were $129,920 in May 2004. 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, and a relatively large proportion of dentists is self-employed. Like other business owners, these dentists must provide their own health insurance, life insurance, and retirement benefits.

**Related Occupations**
Dentists examine, diagnose, prevent, and treat diseases and abnormalities. Chiropractors, optometrists, physicians and surgeons, podiatrists, psychologists, and veterinarians do related 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](http://www.ada.org)

For information on admission to dental schools, contact:

- American Dental Education Association, 1400 K St., NW, Suite 1100, Washington, DC 20005. Internet: [http://www.adea.org](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, 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.
- Faster than average employment growth is expected; however, growth may be constrained if employers substitute other workers for dietitians and if limitations are placed on insurance reimbursement for dietetic services.
- Those who have specialized training in renal or diabetic diets or have a master’s degree should experience good employment opportunities.

**Nature of the Work**
Dietitians and nutritionists plan food and nutrition programs and supervise the preparation and serving of meals. They help to prevent and treat illnesses by promoting healthy eating habits and recommending dietary modifications, such as the use of less salt for those with high blood pressure or the reduction of fat and sugar intake for those who are overweight.

Dietitians manage food service systems for institutions such as hospitals and schools, promote sound eating habits through education, and conduct research. Major areas of practice include clinical, community, management, and consultant dietetics.

Clinical dietitians provide nutritional services for patients in institutions such as hospitals and nursing care facilities. 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 the management of overweight patients or in the care of critically ill or renal (kidney) and diabetic 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, individuals with special needs, and children.

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 the nutritional content of recipes, dietary fiber, or vitamin supplements.

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.

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.

Working Conditions
Most full-time dietitians and nutritionists work a regular 40-hour week, although some work weekends. About 1 in 4 worked part time in 2004.

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

Training, Other Qualifications, and Advancement
High school students interested in becoming a dietitian or nutritionist should take courses in biology, chemistry, mathematics, health, and communications. Dietitians and nutritionists need at least a bachelor’s degree in dietetics, foods and nutrition, food service systems management, or a related area. 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.

Of the 46 States and jurisdictions with laws governing dietetics, 31 require licensure, 14 require 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. Although not required, the Commission on Dietetic Registration of the American Dietetic Association (ADA) awards the Registered Dietitian credential to those who pass an exam after completing their academic coursework and supervised experience.

As of 2004, there were about 227 bachelor’s and master’s degree programs approved by the ADA's Commission on Accreditation for Dietetics Education (CADE).

Supervised practice experience can be acquired in two ways. The first requires the completion of a CADE-accredited program. As of 2004, there were more than 50 accredited programs, which 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 CADE-accredited internships. These internships may be full-time programs lasting 6 to 12 months or part-time programs lasting 2 years. To maintain a registered dietitian status, at least 75 credit hours in approved continuing education classes are required every 5 years.

Students interested in research, advanced clinical positions, or public health may need an advanced degree.

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 may leave the occupation to become sales representatives for equipment, pharmaceutical, or food manufacturers.

Employment
Dietitians and nutritionists held about 50,000 jobs in 2004. 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 about 1 job in 5—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
Employment of dietitians is expected to grow faster than the average for all occupations through 2014 as a result of increasing emphasis on disease prevention through improved dietary habits. A growing and aging population will boost the demand for meals and nutritional counseling 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 management. In addition to employment growth, job openings will result from the need to replace experienced workers who leave the occupation.

The number of dietitian positions in nursing care facilities and in State government hospitals 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. With increased public awareness of obesity and diabetes, Medicare coverage may be expanded to include medical nutrition therapy for renal and diabetic patients. As a result, dietitians that have specialized training in renal or diabetic diets or have a master’s degree should experience good employment opportunities.

Employment growth for dietitians and nutritionists may be constrained if some employers substitute other workers, such as health educators, food service managers, and dietetic technicians. Growth
Occupational therapists assist clients in performing activities of all types, ranging 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 and 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 decisionmaking, abstract-reasoning, problem-solving, and perceptual skills, as well as memory, sequencing, and coordination—all of which are important for independent living.

Therapists instruct those with permanent disabilities, such as spinal cord injuries, cerebral palsy, or muscular dystrophy, in the use of adaptive equipment, including wheelchairs, orthotics, and aids for eating and dressing. They also design or make special equipment needed at home or at work. Therapists develop computer-aided adaptive equipment and teach clients with severe limitations how to use that equipment in order to communicate better and control various aspects of their environment.

Some occupational therapists treat individuals whose ability to function in a work environment has been impaired. These practitioners arrange employment, evaluate the work environment, 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 work can be successfully completed.

Occupational therapists may work exclusively with individuals in a particular age group or with particular disabilities. In schools, for example, they evaluate children’s abilities, recommend and provide therapy, modify classroom equipment, and help children participate as fully as possible in school programs and activities. A therapist may work with children individually, lead small groups in the classroom, consult with a teacher, or serve on a curriculum or other administrative committee. Early intervention therapy services are provided to infants and toddlers who have, or at the risk of having, developmental delays. Specific therapies may include facilitating the use of the hands, promoting skills for listening and following directions, fostering social play skills, or teaching dressing and grooming skills.

Occupational therapy also is beneficial to the elderly population. Therapists help the elderly lead more productive, active, and independent lives through a variety of methods, including the use of adaptive equipment. 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 the client to assess the home for hazards and to identify environmental factors that contribute to falls.

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

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.
Working Conditions
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 2004, more than a quarter of occupational therapists worked part time.

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.

Therapists increasingly are 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. By having assistants and aides work more closely with clients under the guidance of a therapist, the cost of therapy should decline.

Training, Other Qualifications, and Advancement
Currently, a bachelor’s degree in occupational therapy is the minimum requirement for entry into the field. Beginning in 2007, however, a master’s degree or higher will be the minimum educational requirement. As a result, students in bachelor’s-level programs must complete their coursework and fieldwork before 2007. 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 requirements.

In 2005, 122 master’s degree programs offered entry-level education, 65 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. Bachelor’s degree programs in occupational therapy are no longer offered because of the requirement for a master’s degree or higher beginning in 2007. In addition, post baccalaureate certificate programs for students with a degree other than occupational therapy are no longer offered.

Occupational therapy coursework includes the physical, biological, and behavioral sciences and the application of occupational therapy theory and skills. The completion of 6 months of supervised fieldwork also is required.

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

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 must be able to adapt to a variety of settings.

Employment
Occupational therapists held about 92,000 jobs in 2004. About 1 in 10 occupational therapists held more than one job. The largest number of jobs were 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 saw clients referred by physicians or other health professionals or 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 increase much faster than the average for all occupations through 2014. The impact of proposed Federal legislation imposing limits on reimbursement for therapy services may adversely affect the job market for occupational therapists in the short run. However, over the long run, the demand for occupational therapists should continue to rise as a result of growth in the 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. Driver rehabilitation and fall-prevention training for the elderly are emerging practice areas for occupational therapy. 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.

Earnings
Median annual earnings of occupational therapists were $54,660 in May 2004. The middle 50 percent earned between $45,690 and $67,010. The lowest 10 percent earned less than $37,430, and the
highest 10 percent earned more than $81,600. Median annual earnings in the industries employing the largest numbers of occupational therapists in May 2004 were:

- Home health care services ................................................................. $58,720
- Offices of other health practitioners ........................................... 56,620
- Nursing care facilities .................................................................. 56,620
- General medical and surgical hospitals ...................................... 55,710
- Elementary and secondary schools .............................................. 48,580

Related Occupations

Occupational therapists use specialized knowledge to help individuals perform daily living skills and achieve maximum independence. Other workers performing similar duties include 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 a written National Board exam and a clinical examination.
- Employment is expected to grow faster than 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, provide most primary vision care. They examine people’s eyes to diagnose vision problems and eye diseases, and they test patients’ visual acuity, depth and color perception, and ability to focus and coordinate the eyes. Optometrists prescribe eyeglasses and contact lenses and provide vision therapy and low-vision rehabilitation. Optometrists analyze test results and develop a treatment plan. They administer drugs to patients to aid in the diagnosis of vision problems and prescribe drugs to treat some 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. They also diagnose conditions caused by systemic diseases such as diabetes and high blood pressure, referring patients to other health practitioners as needed.

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.)

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.

Working Conditions

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. 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.

Training, Other Qualifications, and Advancement

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 board 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 are renewed every 1 to 3 years and, in all States, continuing education credits are needed for renewal.

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. Most optometry students hold a bachelor’s or higher degree. In 2004, 17 U.S. schools and colleges of optometry offered programs accredited by the Accreditation Council on Optometric Education of the American Optometric Association.

Requirements for admission to schools of optometry include courses in English, mathematics, physics, chemistry, and biology. A few schools also require or recommend courses in psychology, history, sociology, speech, or business. Because a strong background in science is important, many applicants to optometry school major in a science such as biology or chemistry, while other applicants major in another subject and take many science courses offering laboratory experience. Applicants must take the Optometry Admissions Test, which measures academic ability and scientific comprehension. Admission to optometry school is competitive. As a result, most applicants take the test after their sophomore or junior year, 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.

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

Business ability, self-discipline, and the ability to deal tactfully with patients are important for success. The work of optometrists requires attention to detail and manual dexterity.
for anticipated productivity gains that will allow each optometrist care plans, also will spur job growth. Along with rising personal incomes and growth in employee vision hypertension. Greater recognition of the importance of vision care, with its increased likelihood of cataracts, glaucoma, diabetes, and services also will increase because of growth in the oldest age group, from the extensive use of computers. The demand for optometric the onset of vision problems in middle age, including those resulting be more likely to visit optometrists and ophthalmologists because of of a growing and aging population. As baby boomers age, they will for all occupations through 2014, in response to the vision care needs is greater than the number of practicing optometrists because some optometrists hold two or more jobs. For example, an optometrist may have a private practice but also work in another practice, in a clinic, or in a vision care center. According to the American Optometric Association, about three-fourths of practicing optometrists are in private practice. Although many practice alone, optometrists increasingly are in a partnership or group practice. 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. Almost one third of optometrists were self-employed and not incorporated.

Employment
Optometrists held about 34,000 jobs in 2004. The number of jobs is greater than the number of practicing optometrists because some optometrists hold two or more jobs. For example, an optometrist may have a private practice but also work in another practice, in a clinic, or in a vision care center. According to the American Optometric Association, about three-fourths of practicing optometrists are in private practice. Although many practice alone, optometrists increasingly are in a partnership or group practice. 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. Almost one third of optometrists were self-employed and not incorporated.

Job Outlook
Employment of optometrists is expected to grow faster than average for all occupations through 2014, in response to the vision care needs of a growing and aging population. As baby boomers age, they will be more likely to visit optometrists and ophthalmologists because of the onset of vision problems in middle age, including those resulting from the extensive use of computers. The demand for optometric services also will increase because of growth in the oldest age group, with its increased likelihood of cataracts, glaucoma, diabetes, and hypertension. Greater recognition of the importance of vision care, along with rising personal incomes and growth in employee vision care plans, also will spur job growth.

Employment of optometrists would grow more rapidly were it not of optometric assistants and other support personnel, who will reduce the amount of time optometrists need with each patient. Also, laser surgery that can correct some vision problems is available, and although optometrists still will be needed to provide preoperative and postoperative care for laser surgery patients, patients who successfully undergo this surgery may not require optometrists to prescribe glasses or contacts for several years.

In addition to growth, the need to replace optometrists who retire or leave the occupation for another reason will create employment opportunities.

Earnings
Median annual earnings of salaried optometrists were $88,410 in May 2004. The middle 50 percent earned between $63,840 and $118,320. Median annual earnings of salaried optometrists in May 2004 were $87,430 in offices of optometrists. 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 $114,000 in 2004. The middle 50 percent earned between $84,000 and $166,000.

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
➤ American Optometric Association, Educational Services, 243 North Lindbergh Blvd., St. Louis, MO 63141. Internet: http://www.aaoa.net

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

- Very good employment opportunities are expected for pharmacists.
- Earnings are high, but some pharmacists work long hours, nights, weekends, and holidays.
- Pharmacists are becoming more involved in making decisions regarding drug therapy and in counseling patients.
- A license is required; the prospective pharmacist must graduate from an accredited college of pharmacy and pass a State examination.
Nature of the Work
Pharmacists distribute drugs prescribed by physicians and other health practitioners and provide information to patients about medications and their use. They advise physicians and other health practitioners on the selection, dosages, interactions, and side effects of medications. Pharmacists also monitor the health and progress of patients in response to drug therapy to ensure the safe and effective use of medication. Pharmacists must understand the use, clinical effects, and composition of drugs, including their chemical, biological, and physical properties. Compounding—the actual mixing of ingredients to form powders, tablets, capsules, ointments, and solutions—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 and retail pharmacies counsel patients and answer questions about prescription drugs, including questions regarding possible side effects or interactions among various drugs. They provide information about over-the-counter drugs and make recommendations after talking with the patient. They also may give advice about the patient’s diet, exercise, or stress management or about durable medical equipment and home health care supplies. In addition, they also 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 manage conditions such as diabetes, asthma, smoking cessation, or high blood pressure. Some community pharmacists 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 assess, plan, and monitor drug programs or regimens. Pharmacists counsel hospitalized patients on the use of drugs and on their use at home when the patients are discharged. Pharmacists also may evaluate drug-use patterns and outcomes for patients in hospitals or managed care organizations.

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 psychopharmacotherapy (the treatment of mental disorders by means of drugs).

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 in preparation for graduation and licensure.

Increasingly, pharmacists are pursuing nontraditional pharmacy work. Some are involved in research for pharmaceutical manufacturers, developing new drugs and therapies and testing their effects on people. Others work in marketing or sales, providing expertise to clients on a drug’s use, effectiveness, and possible side effects. 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, public health care services, the armed services, and 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.

Working Conditions
Pharmacists work in clean, well-lighted, 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 and masks and work with other special protective equipment. Many community and hospital pharmacies are open for extended hours or around the clock, so pharmacists may work nights, weekends, and holidays. Consultant pharmacists may travel to nursing homes or other facilities to monitor patients’ drug therapy.

About 21 percent of pharmacists worked part time in 2004. Most full-time salaried pharmacists worked approximately 40 hours a week. Some, including many self-employed pharmacists, worked more than 50 hours a week.

Training, Other Qualifications, and Advancement
A license to practice pharmacy is required in all States, the District of Columbia, and all U.S. territories. To obtain a license, the prospective pharmacist must graduate from a college of pharmacy that is accredited by the Accreditation Council for Pharmacy Education (ACPE) and pass an examination. All States require the North American Pharmacist Licensure Exam (NAPLEX), which tests pharmacy skills and knowledge, and 43 states and the District of Columbia require the Multistate Pharmacy Jurisprudence Exam (MPJE), which tests pharmacy law. Both exams are administered by the National Association of Boards of Pharmacy. Pharmacists in the eight states that do not require the MPJE must pass a state-specific exam that is similar to the MPJE. In addition to the NAPLEX and MPJE, some States require additional exams unique to their State. All States except California currently grant a license without extensive reexamination to qualified pharmacists who already are licensed by another State. In Florida, reexamination is not required if a pharmacist has passed the NAPLEX and MPJE within 12 years of his or her application for a license transfer. Many pharmacists are licensed to practice in more than one State. Most States require continuing education for license renewal. Persons interested in a career as a pharmacist should check with individual State boards of pharmacy for details on
... examination requirements, license renewal requirements, and license transfer procedures.

In 2004, 89 colleges of pharmacy were accredited to confer degrees by the Accreditation Council for Pharmacy Education. Pharmacy programs grant the degree of Doctor of Pharmacy (Pharm.D.), which requires at least 6 years of postsecondary study and the passing of a State board of pharmacy’s licensure examination. Courses offered at colleges of pharmacy are designed to teach students about all aspects of drug therapy. In addition, schools teach students how to communicate with patients and other health care providers about drug information and patient care. Students also learn professional ethics, how to develop and manage medication distribution systems, and concepts of public health. In addition to receiving classroom instruction, students in Pharm.D. programs spend about one-fourth of their time learning in a variety of pharmacy practice settings under the supervision of licensed pharmacists. The Pharm.D. degree has replaced the Bachelor of Pharmacy (B.Pharm.) degree, which is no longer being awarded.

The Pharm.D. is a 4-year program that requires at least 2 years of college study prior to admittance, although most applicants have completed 3 years. 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. Approximately two-thirds of all colleges require applicants to take the Pharmacy College Admissions Test (PCAT).

In 2003, the American Association of Colleges of Pharmacy (AACP) launched the Pharmacy College Application Service, known as PharmCAS, for students who are interested in applying to schools and colleges of pharmacy. This centralized service allows applicants to use a single Web-based application and one set of transcripts to apply to multiple schools of pharmacy. A total of 43 schools participated in 2003.

In the 2003–04 academic year, 67 colleges of pharmacy 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 more laboratory and research experience. Many master’s and Ph.D. degree holders do research for a drug company or teach at a university. Other options for pharmacy graduates who are interested in further training include one-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 study. There currently are more than 700 residency training programs nationwide. 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 run their own pharmacy obtain a master’s degree in business administration (MBA). Others may obtain a degree in public administration or public health.

Areas of graduate study include pharmaceutics and pharmaceutical chemistry (physical and chemical properties of drugs and dosage forms), pharmacology (effects of drugs on the body), toxicology and pharmacy administration.

Prospective pharmacists should have scientific aptitude, good communication 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.

In community pharmacies, pharmacists usually begin at the staff level. In independent pharmacies, after they gain experience and secure the necessary capital, some become owners or part owners of pharmacies. 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. Pharmacists in the pharmaceutical industry may advance in marketing, sales, research, quality control, production, packaging, or other areas.

**Employment**

Pharmacists held about 230,000 jobs in 2004. About 61 percent work in community pharmacies that are either independently owned or part of a drugstore chain, grocery store, department store, or mass merchandiser. Most community pharmacists are salaried employees, but some are self-employed owners. About 24 percent of salaried pharmacists work in hospitals. Others work in clinics, mail-order pharmacies, pharmaceutical wholesalers, home health care agencies, or the Federal Government.

**Job Outlook**

Very good employment opportunities are expected for pharmacists over the 2004–14 period because the number of job openings created by employment growth and the need to replace pharmacists who leave the occupation or retire are expected to exceed the number of degrees granted in pharmacy. Enrollments in pharmacy programs are rising as more students are attracted by high salaries and good job prospects. Despite this increase in enrollments, job openings should still be more numerous than those seeking employment.

Employment of pharmacists is expected to grow faster than the average for all occupations through the year 2014, because of the increasing demand for pharmaceuticals, particularly from the growing elderly population. The increasing numbers of middle-aged and elderly people—who use more prescription drugs than younger people—will continue to spur demand for pharmacists in all employment settings. Other factors likely to increase the demand for pharmacists include scientific advances that will make more drug products available, new developments in genome research and medication distribution systems, increasingly sophisticated consumers seeking more information about drugs, and coverage of prescription drugs by a greater number of health insurance plans and Medicare.

Community pharmacies are taking steps to manage an increasing volume of prescriptions. Automation of drug dispensing and greater employment of pharmacy technicians and pharmacy aides will help these establishments to dispense more prescriptions.

With its emphasis on cost control, managed care encourages the use of lower cost prescription drug distributors, such as mail-order firms and online pharmacies, for purchases of certain medications. Prescriptions ordered through the mail and via the Internet are filled in a central location and shipped to the patient at a lower cost. Mail-order and online pharmacies typically use automated technology to dispense medication and employ fewer pharmacists. If the utilization of mail-order pharmacies increases rapidly, job growth among pharmacists could be limited.

Employment of pharmacists will not grow as fast in hospitals as in other industries, because hospitals are reducing inpatient stays, downsizing, and consolidating departments. The number of outpatient surgeries is increasing, so more patients are being discharged and purchasing their medications through retail, supermarket, or mail-order pharmacies, rather than through hospitals. An aging population means that more pharmacy services will be required in nursing homes, assisted-living facilities, and home care settings. The most rapid job growth among pharmacists is expected in these 3 settings.
New opportunities are emerging for pharmacists in managed care organizations where they analyze trends and patterns in medication use, and in pharmacoconomics—the cost and benefit analysis of different drug therapies. Opportunities also are emerging for pharmacists trained in research and disease management—the development of new methods for curing and controlling diseases. Pharmacists also are finding jobs in research and development and in sales and marketing for pharmaceutical manufacturing firms. New breakthroughs in biotechnology will increase the potential for drugs to treat diseases and expand the opportunities for pharmacists to conduct research and sell medications. In addition, pharmacists are finding employment opportunities in pharmacy informatics, which uses information technology to improve patient care.

Job opportunities for pharmacists in patient care will arise as cost-conscious insurers and health systems continue to emphasize the role of pharmacists in primary and preventive health care. Health insurance companies realize that the expense of using medication to treat diseases and various health conditions is considerably less than the costs for patients whose conditions go untreated. Pharmacists also can reduce the expenses resulting from unexpected complications due to allergic reactions or interactions among medications.

Earnings
Median annual wage and salary earnings of pharmacists in May 2004 were $84,900. The middle 50 percent earned between $75,720 and $94,850 a year. The lowest 10 percent earned less than $61,200, and the highest 10 percent earned more than $109,850 a year. Median annual earnings in the industries employing the largest numbers of pharmacists in May 2004 were:

- Department stores .......................................................................................... $86,720
- Grocery stores ................................................................................................ 85,680
- Health and personal care stores .................................................................... 85,380
- General medical and surgical hospitals .......................................................... 84,560
- Other general merchandise stores .................................................................. 84,170

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 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
- 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 the average, as growth in the number of individuals with disabilities or limited functioning spurs demand for therapy services.
- Job opportunities should be particularly good in acute hospital, rehabilitation, and orthopedic settings.
- After graduating from an accredited physical therapist educational program, therapists must pass a licensure exam before they can practice.
- Nearly 6 out of 10 physical therapists work in hospitals or in offices of physical therapists.

#### 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. They also determine patients’ ability to be independent and reintegrate into the community or workplace after injury or illness. Next, physical therapists develop plans describing a treatment strategy, its purpose, and its anticipated outcome. Physical therapist assistants, under the direction and supervision of a physical therapist, may be involved in implementing treatment plans with patients. Physical therapist aides perform routine support tasks, as directed by the therapist. (Physical therapist assistants and aides are discussed elsewhere in the Handbook.)

Treatment often includes exercise for patients who have been immobilized and lack flexibility, strength, or endurance. Physical therapists encourage patients to use their own muscles to increase their flexibility and range of motion before finally advancing to other exercises that improve 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. Therapists also teach patients to use assistive and adaptive devices, such as crutches, prostheses, and wheelchairs. They also may show patients exercises to do at home to expedite their recovery.

As treatment continues, physical therapists document the patient’s progress, conduct periodic examinations, and modify treatments when necessary. Besides tracking the patient’s progress, such documentation identifies areas requiring more or less attention.
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.

**Working Conditions**

Physical therapists practice in hospitals, clinics, and private offices that have specially equipped facilities, or they treat patients in hospital rooms, homes, or schools.

In 2004, most full-time physical therapists worked a 40-hour week; some worked evenings and weekends to fit their patients’ schedules. About 1 in 4 physical therapists worked part time. The job 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.

**Training, Other Qualifications, and Advancement**

All States require physical therapists to pass a licensure exam before they can practice, after graduating from an accredited physical therapist educational program.

According to the American Physical Therapy Association, there were 205 accredited physical therapist programs in 2004. Of the accredited programs, 94 offered master’s degrees, and 111 offered doctoral degrees. All physical therapist programs seeking accreditation are required to offer degrees at the master’s degree level and above, in accordance with the Commission on Accreditation in Physical Therapy Education.

Physical therapist 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 courses that are useful when one applies to a physical therapist educational program are anatomy, biology, chemistry, social science, mathematics, and physics. Before granting admission, many professional education programs require experience as a volunteer in a 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.

Physical therapists should have strong interpersonal skills in order to be able to educate patients about their physical therapy treatments. Physical therapists also should be compassionate and possess a desire to help patients. Similar traits are needed to interact with the patient’s family.

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 155,000 jobs in 2004. 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.

Nearly 6 out of 10 physical therapists worked in hospitals or in offices of physical therapists. Other jobs were in home health care services, 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 the average for all occupations through 2014. 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, over the long run, the demand for physical therapists should continue to rise as growth in the number of individuals with disabilities or limited function spurs demand for therapy services. Job opportunities should be particularly good in acute hospital, rehabilitation, and orthopedic settings, because the elderly receive the most treatment in these settings. The growing 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. Further, young people 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 more disabling conditions.

Widespread interest in health promotion also should increase demand for physical therapy services. A growing number of employers are using physical therapists to evaluate worksites, develop exercise programs, and teach safe work habits to employees in the hope of reducing injuries in the workplace.

**Earnings**

Median annual earnings of physical therapists were $60,180 in May 2004. The middle 50 percent earned between $50,330 and $71,760. The lowest 10 percent earned less than $42,010, and the highest 10 percent earned more than $88,580. Median annual earnings
in the industries employing the largest numbers of physical therapists in May 2004 were:

- Home health care services .......................................................... $64,650
- Nursing care facilities ............................................................... 61,720
- Offices of physicians ................................................................ 61,270
- General medical and surgical hospitals ..................................... 60,350
- Offices of other health practitioners .......................................... 60,130

Related Occupations
Physical therapists rehabilitate persons 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:

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.
- Physician assistants rank among the fastest growing occupations, as physicians and health care institutions increasingly utilize physician assistants in order to contain costs.
- Job opportunities should be good, particularly in rural and inner city clinics.

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 medications. PAs also may have managerial duties. Some order medical supplies or equipment and supervise 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 1 or 2 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 surgery provide preoperative and postoperative care and may work as first or second assistants during major surgery.

Working Conditions
Although PAs usually work in a comfortable, well-lighted environment, those in surgery often stand for long periods, and others do considerable 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
All States require that PAs complete an accredited, formal education program and pass a National exam to obtain a license. PA 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 2005, more than 135 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, while others come from varied backgrounds, including military corpsman/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.

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.” In order 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.
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.

Physician assistants need leadership skills, self-confidence, and emotional stability. They must be willing to continue studying throughout their career to keep up with medical advances.

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 62,000 jobs in 2004. 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 2004.

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 of PAs is expected to grow much faster than the average for all occupations through the year 2014, ranking among the fastest growing occupations, due to anticipated expansion of the health care industry and an emphasis on cost containment, resulting in increasing utilization of PAs by physicians and health care institutions.

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. Job opportunities for PAs should be good, particularly in rural and inner city clinics, because those settings have difficulty attracting physicians.

Beside the traditional office-based setting, PAs should find a growing number of jobs in institutional settings such as hospitals, academic medical centers, public clinics, and prisons. Additional PAs 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. Opportunities will be best in States that allow PAs a wider scope of practice.

**Earnings**

Median annual earnings of physician assistants were $69,410 in May 2004. The middle 50 percent earned between $57,110 and $83,560. The lowest 10 percent earned less than $37,320, and the highest 10 percent earned more than $94,880. Median annual earnings of physician assistants in 2004 were $70,310 in general medical and surgical hospitals and $69,210 in offices of physicians.

According to the American Academy of Physician Assistants, median income for physician assistants in full-time clinical practice in 2004 was $74,264; median income for first-year graduates was $64,536. 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:


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

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; over one-third of full-time physicians worked 60 or more hours a week in 2004.
- 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.
- New physicians are much less likely to enter solo practice and more likely to work as salaried employees of group medical practices, clinics, hospitals, or health networks.

Nature of the Work

Physicians and surgeons serve a fundamental role in our society and have an effect upon all our lives. They 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 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 more likely than M.D.s 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 intern 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. Anesthesiologists focus on the care of surgical patients and pain relief. Like other physicians, they evaluate and treat patients and direct the efforts of those on their staffs. Anesthesiologists confer with other physicians and surgeons about appropriate treatments and procedures before, during, and after operations. These critical care specialists are responsible for maintenance of the patient’s vital life functions—heart rate, body temperature, blood pressure, breathing—through continual monitoring and assessment during surgery. They often 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.

Family and general practitioners. Family and general practitioners are often the first point of contact for people seeking health care, acting as the traditional family doctor. They assess and treat a wide range of conditions, ailments, and injuries, from sinus and respiratory infections to broken bones and scrapes. Family and general practitioners typically have a patient base of regular, long-term visitors. Patients with more serious conditions are referred to specialists or other health care facilities for more intensive care.

General internists. General internists diagnose and provide nonsurgical treatment for diseases and injuries of internal organ systems. They provide care mainly for adults who have a wide range of problems associated with the internal organs, 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 are commonly looked upon as primary care specialists. They have patients referred to them by other specialists, in turn referring patients to those and yet other specialists when more complex care is required.

General pediatricians. Providing care from birth to early adulthood, pediatricians are concerned with the health of infants, children, and teenagers. They specialize in the diagnosis and treatment of a variety of ailments specific to young people and track their 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, such as muscular dystrophy. Most of the work of pediatricians, however, involves treating day-to-day illnesses that are common to children—minor injuries, infectious diseases, and immunizations—much as a general practitioner treats adults. Some pediatricians specialize in serious medical conditions and pediatric surgery, treating autoimmune disorders or serious chronic ailments.

Obstetricians and gynecologists. Obstetricians and gynecologists (ob/gyns) are specialists whose focus is women’s health. They are responsible for general medical care for women, but also provide care related to pregnancy and the reproductive system. Like general practitioners, ob/gyns are concerned with the prevention, diagnosis, and treatment of general health problems, but they focus on ailments specific to the female anatomy, such as breast and cervical cancer, 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 delivery and postpartum care. Ob/gyns track the health of, and treat, both mother and fetus as the pregnancy progresses.

Psychiatrists. 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, and 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 may be causing emotional problems. Psychiatrists may also administer electroconvulsive therapy to those of their patients who do not respond to, or who cannot take, medications.

Surgeons. Surgeons are physicians who specialize in the treatment of injury, disease, and deformity through operations. Using a variety of instruments, and with patients under general or local 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 primary care and other specialist physicians, surgeons also examine patients, perform and interpret diagnostic tests, and counsel patients on preventive health care.

A number of other medical and surgical specialists, including allergists, cardiologists, dermatologists, emergency physicians, gastroenterologists, ophthalmologists, pathologists, and radiologists, also work in clinics, hospitals, and private offices.

Working Conditions
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. These physicians often work as part of a team coordinating care for a population of patients; they are less independent than solo practitioners of the past.

Surgeons and anesthesiologists typically work in well-lighted, 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 2004. Only 8 percent of all physicians and surgeons worked part-time, compared with 16 percent for all occupations. Physicians and surgeons must travel frequently between office and hospital to care for their patients. Those who are on call deal with many patients’ concerns over the phone and may make emergency visits to hospitals or nursing homes.

Training and Other Qualifications
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 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 a 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.

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 specialty boards, 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.

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. 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 in order to keep up with medical advances.

Employment
Physicians and surgeons held about 567,000 jobs in 2004; approximately 1 out of 7 was self-employed and not incorporated. About 60 percent of salaried physicians and surgeons were in office of physicians, and 16 percent were employed by private hospitals. Others practiced in Federal, State, and local governments, including hospitals, colleges, universities, and professional schools; private colleges, universities, and professional schools; and outpatient care centers.
According to the American Medical Association (AMA), in 2003 about 2 out 5 physicians in patient care were in primary care, but not in a subspecialty of primary care (table 1).

Table 1. Percent distribution of physicians by specialty, 2003  

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
<tr>
<td>Primary care</td>
<td>40.8</td>
</tr>
<tr>
<td>Family medicine and general practice</td>
<td>12.8</td>
</tr>
<tr>
<td>Internal medicine</td>
<td>15.1</td>
</tr>
<tr>
<td>Obstetrics &amp; gynecology</td>
<td>5.3</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>7.6</td>
</tr>
<tr>
<td>Specialties</td>
<td>59.2</td>
</tr>
<tr>
<td>Anesthesiology</td>
<td>5.4</td>
</tr>
<tr>
<td>Psychiatry</td>
<td>5.4</td>
</tr>
<tr>
<td>Surgical specialties, selected</td>
<td>14.6</td>
</tr>
<tr>
<td>All other specialties</td>
<td>33.9</td>
</tr>
</tbody>
</table>


A growing number of physicians are partners or salaried employees of group practices. Organized as clinics or as associations of physicians, medical groups can afford expensive medical equipment and realize 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 hospital and education centers.

**Job Outlook**

Employment of physicians and surgeons is projected to grow faster than the average for all occupations through the year 2014 due to continued expansion of health care 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. In addition to employment growth, job openings will result from the need to replace physicians and surgeons who retire over the 2004-14 period.

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. Demand for physician services may also be tempered by patients relying more on other health care providers—such as physician assistants, nurse practitioners, optometrists, and nurse anesthetists—for some health care services. In addition, new technologies will increase physician productivity. Telemedicine will allow physicians to treat patients or consult with other providers remotely. Increasing use of electronic medical records, test and prescription orders, billing, and scheduling will also improve physician productivity.

Opportunities for individuals interested in becoming physicians and surgeons are expected to be very good. Reports of shortages in some specialties or geographic areas should attract new entrants, encouraging schools to expand programs and hospitals to expand 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, because some physicians find these areas unattractive due to less control over work hours, isolation from medical colleagues, or other reasons.

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.

**Earnings**

Earnings of physicians and surgeons are among the highest of any occupation. According to the Medical Group Management Association’s Physician Compensation and Production Survey, median total compensation for physicians in 2004 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/or incentive payments, research stipends, honoraria, and distribution of profits were included in total compensation.

Table 2. Median total compensation of physicians by specialty, 2004  

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Less than two years in specialty</th>
<th>Over one year in specialty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesiology</td>
<td>$259,948</td>
<td>$321,686</td>
</tr>
<tr>
<td>Surgery: General</td>
<td>228,839</td>
<td>282,504</td>
</tr>
<tr>
<td>Obstetrics/gynecology: General</td>
<td>203,270</td>
<td>247,348</td>
</tr>
<tr>
<td>Psychiatry: General</td>
<td>173,922</td>
<td>180,000</td>
</tr>
<tr>
<td>Internal medicine: General</td>
<td>141,912</td>
<td>166,420</td>
</tr>
<tr>
<td>Pediatrics: General</td>
<td>132,953</td>
<td>161,331</td>
</tr>
<tr>
<td>Family practice (without obstetrics)</td>
<td>137,119</td>
<td>156,011</td>
</tr>
</tbody>
</table>


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, and 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:

➤ Association of American Medical Colleges, Section for Student Services, 2450 N St. NW, Washington, DC 20037-1126. Internet: [http://www.aamc.org](http://www.aamc.org)

➤ American Association of Colleges of Osteopathic Medicine, 5550 Friendship Blvd., Suite 310, Chevy Chase, MD 20815-7231. Internet: [http://www.aacom.org](http://www.aacom.org)

For general information on physicians, contact:
Podiatrists treat corns, calluses, ingrown toenails, bunions, infections due to 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, 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.

Working Conditions
Podiatrists usually work in their own offices. They also may spend time visiting patients in nursing homes or performing surgery at hospitals or ambulatory surgical centers, but usually have fewer afterhours emergencies than other doctors have. Those with private practices set their own hours, but may work evenings and weekends to accommodate their patients.

Training, Other Qualifications, and Advancement
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. Most States also require the completion of a postdoctoral residency program of at least 2 years and continuing education for license renewal.

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). All of the colleges require 8 semester hours each of biology, inorganic chemistry, organic chemistry, and physics, as well as 6 hours of English. The science courses should be those designed for premedical students. Potential podiatric medical students also are evaluated on the basis of extracurricular and community activities, personal interviews, and letters of recommendation. About 95 percent of podiatric students have at least a bachelor’s degree.

In 2005, there were seven colleges of podiatric medicine 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
Podiatrists diagnose and treat disorders of the feet and ankles.

anatomy, chemistry, pathology, and pharmacology. Third- 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 pediatric 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.

There are a number of certifying boards for the podiatric specialties of orthopedics, primary medicine, and surgery. Certification means that the DPM meets higher standards than those required for 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.

People planning a career in podiatry should have scientific aptitude, manual dexterity, interpersonal skills, and good business sense.

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

Employment
Podiatrists held about 10,000 jobs in 2004. About 23 percent of podiatrists are 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, although some also were incorporated wage and salary workers in offices of other health practitioners. Other podiatrists are employed in hospitals and by the Federal Government.

Job Outlook
Employment of podiatrists is expected to grow about as fast as the average for all occupations through 2014. 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. Additional job openings will result from podiatrists who retire from the occupation, particularly members of the baby-boom generation. However, relatively few job openings from this source are expected because the occupation is small and most podiatrists remain in it until they retire.

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, ordinarily is not 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. Opportunities will be better for board-certified podiatrists, because many managed-care organizations require board certification. Opportunities for newly trained podiatrists will be better 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 are concentrated.

Earnings
Podiatrists enjoy very high earnings. Median annual earnings of salaried podiatrists were $94,400 in 2004. Additionally, a survey by Podiatry Management Magazine reported median net income of $113,000 in 2004. Podiatrists in partnerships tended to earn higher net incomes than those in solo practice. Self-employed podiatrists must provide for their own health insurance and retirement.

Related Occupations
Other workers who apply medical knowledge to prevent, diagnose, and treat lower body 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:
Information on the colleges of podiatric medicine and their entrance requirements, curricula, and student financial aid is available from:
Significant Points

- Good job opportunities are expected; applicants who are certified and who possess a bachelor’s or an associate degree or a certificate in radiation therapy should have the best prospects.
- Employment is projected to grow faster than average.
- Radiation therapists need good communication skills because their work involves a great deal of patient interaction.

Nature of the Work
Radiation therapy is the use of radiation to treat cancer in the human body. 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 sometimes is used as the sole treatment for cancer, but usually is used in conjunction with chemotherapy or surgery.

The first step in the radiation treatment process is called simulation. During simulation, a radiation therapist uses an x-ray imaging machine to pinpoint the location of the tumor. The therapist also may use a computerized tomography or CT scan to help determine how best to direct the radiation to minimize damage to healthy tissue. The therapist then positions the patient and adjusts the linear accelerator so that, during treatment, 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.

After simulation, the radiation therapist positions the patient and adjusts the linear accelerator to mirror the conditions that were established in simulation. Then the therapist leaves the room to administer the radiation treatment. 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 a period of 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. In addition, the therapist must be aware of the patient’s emotional condition. 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 also must 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 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 unwanted side effects to a minimum.

Radiation therapists also assist medical radiation physicists, who keep the linear accelerator working. 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, who calculate the amount of radiation for each treatment. Therapists may perform the routine aspects of this process, called dosimetry, which involves complex mathematical computations.

Working Conditions
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. Therapists also work on their feet most of the time. Therapists generally work 40 hours a week, and, unlike 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.

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

Employers generally 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 have core courses on radiation therapy procedures and the scientific theories behind these procedures. In addition, such programs often include courses on human anatomy, human physiology, physics, algebra, precalculus, writing, public speaking, computer science, and research methodology.

Some States require that radiation therapists be licensed by a State accrediting board. Some States, as well as many employers, also require that radiation therapists be certified by the American Registry of Radiologic Technologists (ARRT). In order to become ARRT-certified, an applicant needs to complete an accredited radiation therapy program, adhere to ARRT ethical standards, and pass the ARRT certification examination. In 2005 there were 94 accredited radiation therapy programs. While enrolled in an accredited radiation therapy program, students who wish to become ARRT-certified must take classes that are related to the subject matter of the certification examination. The certification examination covers radiation 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, which include patient care activities; simulation procedures; dosimetry calculations; fabrication of beam modification devices; low-volume, high-risk procedures; and radiation treatment procedures.

AART certification is valid for 1 year, after which therapists must renew their certification. Requirements for renewal include abiding by the ARRT ethical standards, paying the annual dues, and satisfying the 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 successful attainment of ARRT certification in a discipline other than radiation therapy. Renewed certification, however, may not be required by all States or employers that require initial certification.

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. Individuals also need good communication skills because their work involves a great deal of patient interaction. 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.

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 2004. About 84 percent worked in the health care industry, primarily in hospitals and in physicians’ offices. Another 13 percent worked for State and local governments.

Job Outlook

Good job opportunities are expected. Applicants who are certified and who possess a bachelor’s or an associate degree or a certificate in radiation therapy should have the best prospects.

Employment of radiation therapists is projected to grow faster than the average for all occupations during the 2004-14 period. As the U.S. population grows and ages, demand will increase for radiation treatment. As radiation technology advances, radiation treatment will be prescribed for an increasing proportion of cancer patients. In addition to new jobs created over the projection period, a number of job openings will result as experienced radiation therapists retire or leave the occupation for other reasons.

Earnings

The median annual earnings of radiation therapists in May 2004 were $57,700. The middle 50 percent earned between $47,380 and $69,650. The lowest 10 percent earned less than $38,550, and the highest 10 percent earned more than $83,340. 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 radiation technologists and technicians, diagnostic medical sonographers, nuclear medicine technicians, dental hygienists, respiratory therapists, physical therapy assistants and aides, registered nurses, and physicians and surgeons.

Besides radiation therapists, occupations that build relationships with patients and provide them with emotional support include nurses, 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, 15000 Central Ave., SE., Albuquerque, NM 87123-3917. Internet: http://www.asrt.org

Information on careers in radiation therapy may be obtained from:

➤ American Society of Radiologic Technologists, 15000 Central Ave., SE., Albuquerque, NM 87123-3917. Internet: http://www.asrt.org

Recreational Therapists

(O*NET 29-1125.00)

Significant Points

- Overall employment of recreational therapists is expected to grow more slowly than the average for all occupations, but employment of therapists who work in community care facilities for the elderly and in residential mental retardation, mental health, and substance abuse facilities should grow faster than the average.

- Opportunities should be best for persons with a bachelor’s degree in therapeutic recreation, or in recreation with a concentration in therapeutic recreation.

- 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 to 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 treat 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, as well as reduce or eliminate the effects of their illness or disability. In addition, therapists help integrate people with disabilities into the community by teaching them how to use community resources and recreational activities. Recreational therapists should not be confused with 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 related to illnesses and disabilities.

Recreational therapists assess clients on the basis of information the therapists learn from standardized assessments, observations, medical records, 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, clients who are isolated from others or who have limited social skills may be encouraged to play games with others, and right-handed persons with right-side paralysis may be instructed in how to adapt to using 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 conservation techniques, and individual as well as team activities. In addition, 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 programs for older adults and people with disabilities. Included in the last group are programs and facilities such as 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. Although most therapists are employed in other areas, those who work in schools help counselors, teachers, and parents address the special needs of students, including easing disabled students’ transition into adult life.

Working Conditions
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 instruct the clients regarding the accessibility of public transportation and other public areas, such as parks, playgrounds, swimming pools, restaurants, and theaters.

Therapists often lift and carry equipment, as well as lead recreational activities. 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 in therapeutic recreation, or in recreation with a concentration in therapeutic recreation, is the usual requirement for entry-level positions. Persons may qualify for paraprofessional positions with an associate degree in therapeutic recreation or a health care related field. An associate degree in recreational therapy; training in art, drama, or music therapy; or qualifying work experience may be sufficient for activity director positions in nursing homes.

Approximately 150 programs prepare students to become recreational therapists. Most offer bachelor’s degrees, although some also offer associate, master’s, or doctoral degrees. 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.

Although certification is usually voluntary, most employers prefer to hire candidates who are certified therapeutic recreation specialists. The National Council for Therapeutic Recreation Certification is the certificatory agency. To become certified, specialists must have a bachelor’s degree, pass a written certification examination, and complete an internship of at least 480 hours. Additional requirements apply in order to maintain certification and to recertify. Some States require licensure or certification to practice recreational therapy.

Recreational therapists should be comfortable working with persons who are ill or who have disabilities. 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.

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 24,000 jobs in 2004. About 6 out of 10 were in nursing care facilities and hospitals. Others worked in State and local government agencies and in community care fa-
ilities 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 through the year 2014. 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. Employment is expected to decline, however, in hospitals as services shift to outpatient settings and employers emphasize cost containment. Fast employment growth is expected in the residential and outpatient settings that serve disabled persons, the elderly, or those diagnosed with mental retardation, mental illness, or substance abuse problems. Among these settings are community care facilities for the elderly (including assisted-living facilities); residential mental retardation, mental health, and substance abuse facilities; and facilities that provide individual and family services (such as day care centers for disabled persons and the elderly). Opportunities should be best for persons with a bachelor’s degree in therapeutic recreation or in recreation with an option in therapeutic recreation. Opportunities also should be best for good therapists who hold specialized certifications, for example, in aquatic therapy, meditation, or crisis intervention.

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. A rehabilitation, home health care, and transitional programs will provide additional jobs. The rapidly growing number of older adults is expected to spur job growth for recreational therapy professionals and paraprofessionals in assisted-living facilities, adult day care programs, and other social assistance agencies. Continued growth also is expected in community residential care facilities, as well as in day care programs for individuals with disabilities.

Earnings
Median annual earnings of recreational therapists were $32,900 in May 2004. The middle 50 percent earned between $25,520 and $42,130. The lowest 10 percent earned less than $20,130, and the highest 10 percent earned more than $51,800. In May 2004, median annual earnings for recreational therapists were $28,130 in nursing care facilities.

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, and rehabilitation counselors.

Sources of Additional Information
For information on how to order materials describing careers and academic programs in recreational therapy, contact:
- National Therapeutic Recreation Society, 22377 Belmont Ridge Rd., Ashburn, VA 20148-4501. Internet: http://www.ntra.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

Registered Nurses
(O*NET 29-1111.00)

Significant Points
- Registered nurses constitute the largest health care occupation, with 2.4 million jobs.
- About 3 out of 5 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 create the second largest number of new jobs among all occupations; job opportunities in most specialties and employment settings are expected to be excellent, with some employers reporting difficulty in attracting and retaining enough RNs.

Nature of the Work
Registered nurses (RNs), regardless of specialty or work setting, perform basic duties that include treating patients, educating patients and the public about various medical conditions, and providing advice and emotional support to patients’ family members. RNs record patients’ medical histories and symptoms, help to 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, including post-treatment home care needs, diet and exercise programs, and self-administration of medication and physical therapy. Some RNs also are trained to provide grief counseling to family members of critically ill patients. RNs work to promote general health by educating the public on various warning signs and symptoms of disease and where to go for help. RNs also might run general health screening or immunization clinics, blood drives, and public seminars on various conditions.

RNs can specialize in one or more patient care specialties. The most common specialties can be divided into roughly four categories—by work setting or type of treatment; disease, ailment, or condition; organ or body system type; or population. RNs may combine specialties from more than one area—for example, pediatric oncology or cardiac emergency—depending on personal interest and employer needs.

RNs may specialize by work setting or by type of care provided. For example, ambulatory care nurses treat patients with a variety of illnesses and injuries on an outpatient basis, either 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 or the Internet. Critical care nurses work in critical or intensive care hospital units and provide care to patients with cardiovascular, respiratory, or pulmonary failure. Emergency, or trauma, nurses work in hospital emergency departments and treat patients with life-threatening conditions caused by accidents, heart attacks, and strokes. Some emergency nurses are flight nurses, who provide medical care to patients who must be flown by helicopter to the nearest medical facility. Holistic nurses provide care such as acupuncture, massage and aroma therapy, and
biofeedback, which are meant to treat patients’ mental and spiritual health in addition to their physical health. Home health care nurses provide at-home care for patients who are recovering from surgery, accidents, and childbirth. Hospice and palliative care nurses provide care for, and help ease the pain of, terminally ill patients outside of hospitals. Infusion nurses administer medications, fluids, and blood to patients through injections into patients’ veins. Long-term care nurses provide medical services on a recurring basis to patients with chronic physical or mental disorders. Medical-surgical nurses provide basic medical care to a variety of patients in all health settings. Occupational health nurses provide treatment for job-related injuries and illnesses and help employers to detect workplace hazards and implement health and safety standards. Peri anesthe sia nurses provide preoperative and postoperative care to patients undergoing anesthesia during surgery. 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 nurses treat patients with personality and mood disorders. Radiologic nurses provide care to patients undergoing diagnostic radiation procedures such as ultrasound and magnetic resonance imaging. 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 condition are employed in virtually all work settings, including physicians’ offices, outpatient treatment facilities, home health care agencies, and hospitals. For instance, addictions nurses treat patients seeking help with alcohol, drug, and tobacco addictions. Developmental disabilities nurses provide care for patients with physical, mental, or behavioral disabilities; care may include help with feeding, controlling bodily functions, and sitting or standing independently. 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 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 administer radiation and chemotherapies. Finally, 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 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 specialty physicians’ offices or outpatient care facilities, although some are employed in hospital specialty or critical care units. For example, cardiac and vascular 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 specialize in endoscopic procedures, 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.

Finally, RNs may specialize by providing preventive and acute care in all health care settings to various segments of the population, 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 medical professionals.

Most RNs work as staff nurses, providing critical health care services along with physicians, surgeons, and other health care practitioners. However, some RNs choose to become advanced practice nurses, who often are considered primary health care practitioners and work independently or in collaboration with physicians. For example, clinical nurse specialists provide direct patient care and expert consultations in one of many of the nursing specialties listed above. Nurse anesthetists administer anesthesia, monitor patient’s vital signs during surgery, and provide postanesthesia care. 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 provide basic preventive health care to patients, and increasingly serve as primary and specialty care providers in mainly medically underserved areas. The most common areas of specialty for nurse practitioners are family practice, adult practice, women’s health, pediatrics, acute care, and gerontology; however, there are many other specialties. In most States, advanced practice nurses can prescribe medications.

Some nurses have jobs that require little or no direct patient contact. Most of these positions still require an active RN license. Case managers ensure that all of the medical needs of patients with severe injuries and illnesses are met, including the type, location, and duration of treatment. Forensics nurses combine
nursing with law enforcement by treating and investigating victims of sexual assault, child abuse, or accidental death. Infection control nurses identify, track, and control infectious outbreaks in health care facilities; develop methods of outbreak prevention and biological terrorism responses; and staff immunization clinics. 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, and maintain medical supply inventories. Nurse educators teach student nurses and also provide continuing education for RNs. Nurse informaticists collect, store, and analyze nursing data in order to improve efficiency, reduce risk, and improve patient care. RNs also may work as health care consultants, public policy advisors, pharmaceutical and medical supply researchers and salespersons, and medical writers and editors.

Working Conditions
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 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 office settings are more likely to work regular business hours. About 23 percent of RNs worked part time in 2004, and 7 percent held more than one job.

Nursing has its hazards, especially in hospitals, nursing care facilities, and clinics, where nurses may care for individuals with infectious diseases. 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 who work with critically ill patients also may suffer emotional strain from observing patient suffering and from close personal contact with patients’ families.

Training, Other Qualifications, and Advancement
In all States and the District of Columbia, 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. Currently 18 States participate in the Nurse Licensure Compact Agreement, which allows nurses to practice in member States without recertifying. All States require periodic renewal of licenses, which may involve continuing education.

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 2004, 674 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 846 RN programs in 2004 granted associate degrees. Diploma programs, administered in hospitals, last about 3 years. Only 69 programs offered diplomas in 2004. Generally, licensed graduates of any of the three types of educational programs qualify for entry-level positions as staff nurses.

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 a staff nurse position and then take advantage of tuition reimbursement benefits to work toward a BSN by completing an RN-to-BSN program. In 2004, there were 600 RN-to-BSN programs in the United States. Accelerated master’s degree programs in nursing also are available. These programs combine 1 year of an accelerated BSN program with 2 years of graduate study. In 2004, there were 137 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 2004, more than 165 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.

Individuals considering nursing should carefully weigh the advantages and disadvantages of enrolling in a BSN 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 for 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. In 2004, 417 nursing schools offered master’s degrees, 93 offered doctoral degrees, and 46 offered accelerated BSN-to-doctoral programs.

All four advanced practice nursing specialties require at least a master’s degree. Most programs last about 2 years and require a BSN degree and some programs require at least 1 to 2 years of clinical experience as an RN for admission. In 2004, there were 329 master’s and post-master’s programs offered for nurse practitioners, 218 master’s and post-master’s programs for clinical nurse specialists, 92 programs for nurse anesthetists, and 45 programs for nurse midwives. Upon completion of a program, most advanced practice nurses become nationally certified in their area of specialty. In some States, certification in a specialty is required in order to practice that specialty.

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.

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.

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, and with experience and good performance often are promoted to more responsible positions. In management, nurses can advance to assistant head nurse or head nurse and, from there, to assistant director, director, and vice president. Increasingly, management-level nursing positions require a graduate or an advanced degree in nursing or health services administration. They also require leadership, 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.

Foreign-educated nurses wishing to work in the United States must obtain a work visa. Applicants are required to undergo a review of their education and licensing credentials and pass a nursing certification and English proficiency exam, both conducted by the Commission on Graduates of Foreign Nursing Schools. (The commission is an immigration-neutral, nonprofit organization that is recognized internationally as an authority on credentials evaluation in the health care field.) Applicants from Australia, Canada (except Quebec), Ireland, New Zealand, and the United Kingdom are exempt from the language proficiency exam. In addition to these national requirements, most States have their own requirements.

**Employment**

As the largest health care occupation, registered nurses held about 2.4 million jobs in 2004. About 3 out of 5 jobs were in hospitals, in inpatient and outpatient departments. Others worked in offices of physicians, nursing care facilities, home health care services, employment services, government agencies, and outpatient care centers. The remainder worked mostly in social assistance agencies and educational services, public and private. About 1 in 4 RNs worked part time.

**Job Outlook**

Job opportunities for RNs in all specialties are expected to be excellent. Employment of registered nurses is expected to grow much faster than the average for all occupations through 2014, and, because the occupation is very large, many new jobs will result. In fact, registered nurses are projected to create the second largest number of new jobs among all occupations. Thousands of job openings also will result from the need to replace experienced nurses who leave the occupation, especially as the median age of the registered nurse population continues to rise.

Much faster-than-average growth will be driven by technological advances in patient care, which permit a greater number of medical 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.

Employers in some parts of the country and in certain employment settings are reporting 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 couple of years as students seek jobs with stable employment. However, many qualified applicants are being turned away because of a shortage of nursing faculty to teach classes. The need for nursing faculty will only increase as a large number of instructors near retirement. Many employers also are relying on foreign-educated nurses to fill open positions.

Even though employment opportunities for all nursing specialties are expected to be excellent, they can vary by employment setting. For example, employment is expected to grow more slowly in hospitals—which comprise 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.

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.

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 much faster than average in these places as health care in general expands. However, RNs may face greater competition for these positions because they generally offer regular working hours and more comfortable working environments.

Employment in nursing care facilities is expected to grow faster than average because of increases in the number of elderly, many of whom require long-term care. In addition, the financial pressure on hospitals to discharge patients as soon as possible should produce more admissions to nursing care facilities. 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.

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, midwives, and 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 $52,230 in May 2004. The middle 50 percent earned between $43,370 and $63,360. The lowest 10 percent earned less than $37,300, and the highest 10 percent earned more than $74,760. Median annual earnings in the industries employing the largest numbers of registered nurses in May 2004 were as follows:

<table>
<thead>
<tr>
<th>Industry</th>
<th>Annual Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment services</td>
<td>$63,170</td>
</tr>
<tr>
<td>General medical and surgical hospitals</td>
<td>$53,450</td>
</tr>
<tr>
<td>Home health care services</td>
<td>$48,990</td>
</tr>
<tr>
<td>Offices of physicians</td>
<td>$48,250</td>
</tr>
<tr>
<td>Nursing care facilities</td>
<td>$48,220</td>
</tr>
</tbody>
</table>
Many employers offer flexible work schedules, child care, educational benefits, and bonuses.

Related Occupations
Workers in other health care occupations with responsibilities and duties related to those of registered nurses are cardiovascular technologists and technicians; diagnostic medical sonographers; dietitians and nutritionists; emergency medical technicians and paramedics; licensed practical and licensed vocational nurses; massage therapists; medical and health services managers; nursing, psychiatric, and home health aides; occupational therapists; physical therapists; physician assistants; physicians and surgeons; radiologic technologists and technicians; respiratory therapists; and surgical technologists.

Sources of Additional Information
For information on a career as a registered nurse and nursing education, contact:

For information on nursing career options, financial aid, and listings of BSN, graduate, and accelerated nursing programs, 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 States’ 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 obtaining U.S. certification and work visas for foreign-educated nurses, contact:

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

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, 2900, Chicago, IL 60611. Internet: http://www.acn.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

Significant Points
● Job opportunities will be very good, especially for therapists with cardiopulmonary care skills or experience working with infants.
● All States (except Alaska and Hawaii), the District of Columbia, and Puerto Rico require respiratory therapists to obtain a license.
● Hospitals will continue to employ the vast majority of respiratory therapists, but a growing number of therapists will work 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, respiratory 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; furthermore, the two have the same education and training requirements. However, therapists generally have greater responsibility than technicians. For example, respiratory therapists will consult with physicians and other health care staff to help develop and modify individual 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 therapists 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, as well as 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 patients’ breathing capacity and determine the concentration of oxygen and other gases in patients’ blood. They also measure patients’ 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 pH levels, therapists draw an arterial blood sample, place it in a blood gas analyzer, and relay the results to a physician, who then may make treatment decisions.

To treat patients, respiratory therapists use oxygen or oxygen mixtures, chest physiotherapy, and aerosol medications. 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 set the oxygen

Respiratory Therapists
(O*NET 29-1126.00, 29-2054.00)
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 the 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. In home care, therapists teach patients and their families to use ventilators and other life-support systems. In addition, therapists visit patients several times a month to inspect and clean equipment and to ensure its proper use. Therapists also make emergency visits if equipment problems arise.

Respiratory therapists perform chest physiotherapy on patients to remove mucus from their lungs and make it easier for them to breathe. For example, during surgery, anesthesia depresses respiration, so chest 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 place patients in positions that help drain mucus, and then vibrate the patients’ rib cages and instruct the patients to cough.

Respiratory therapists also administer aerosols—liquid medications suspended in a gas that forms a mist which is inhaled—and teach patients how to inhale the aerosol properly to ensure its effectiveness.

In some hospitals, therapists perform tasks that fall outside their traditional role. Therapists’ tasks are expanding into 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.

Working Conditions
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 a great deal of stress. Respiratory therapists employed in home health care must travel frequently to the homes of patients.

Respiratory therapists are trained to work with hazardous 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 therapists run the risk of catching an infectious disease, but carefully following proper procedures minimizes this risk.

Training, Other Qualifications, and Advancement
Formal training is necessary for entry into this field. Training is offered at the postsecondary level by colleges and universities, medical schools, vocational-technical institutes, and the Armed Forces. An associate’s degree is required for entry into the field. Most programs award associate’s or bachelor’s degrees and prepare graduates for jobs as advanced respiratory therapists. A limited number of associate’s degree programs lead to jobs as entry-level respiratory therapists. According to the Commission on Accreditation of Allied Health Education Programs (CAAHEP), 51 entry-level and 329 advanced respiratory therapy programs were accredited in the United States, including Puerto Rico, in 2005.

Among the areas of study in respiratory therapy 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.

The National Board for Respiratory Care (NBRC) offers certification and registration to graduates of programs accredited by CAAHEP or the Committee on Accreditation for Respiratory Care (CoARC). Two credentials are awarded to respiratory therapists who satisfy the requirements: Registered Respiratory Therapist (RRT) and Certified Respiratory Therapist (CRT). Graduates from accredited entry-level or advanced-level programs in respiratory therapy may take the CRT examination. CRTs who were graduated from advanced-level programs and who meet additional experience requirements can take two separate examinations leading to the award of the RRT credential.

All States (except Alaska and Hawaii), the District of Columbia, and Puerto Rico require respiratory therapists to obtain a license. Passing the CRT exam qualifies respiratory therapists for State licenses. Also, most employers require respiratory therapists to maintain a cardiopulmonary resuscitation (CPR) certification. Supervisory positions and intensive-care specialties usually require the RRT or at least RRT eligibility.

Therapists should be sensitive to patients’ 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.

High school students interested in a career in respiratory care 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.

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 bachelor’s or master’s degrees, also may advance to supervisory or managerial roles.
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.

**Employment**

Respiratory therapists held about 118,000 jobs in 2004. More than 4 out of 5 jobs were in hospital 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 13 percent held another job, compared with 5 percent of workers in all occupations.

**Job Outlook**

Job opportunities are expected to be very good, especially for respiratory therapists with cardiopulmonary care skills or experience working with infants. Employment of respiratory therapists is expected to increase faster than the average for all occupations through the year 2014, because of substantial growth in the numbers of the middle-aged and elderly population—a development that will heighten the incidence of cardiopulmonary disease—and because of the expanding role of respiratory therapists in the early detection of pulmonary disorders, case management, disease prevention, and emergency care.

Older Americans suffer most from respiratory ailments and cardiopulmonary diseases such as pneumonia, chronic bronchitis, emphysema, and heart disease. As their numbers increase, the need for respiratory therapists will 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.

Although hospitals will continue to employ the vast majority of therapists, a growing number can expect to work outside of hospitals in home health care services, offices of physicians or other health practitioners, or consumer-goods rental firms.

**Earnings**

Median annual earnings of respiratory therapists were $43,140 in May 2004. The middle 50 percent earned between $37,650 and $50,860. The lowest 10 percent earned less than $32,220, and the highest 10 percent earned more than $57,580. In general medical and surgical hospitals, median annual earnings of respiratory therapists were $43,140 in May 2004.

Median annual earnings of respiratory therapy technicians were $36,740 in May 2004. The middle 50 percent earned between $30,490 and $43,830. The lowest 10 percent earned less than $24,640, and the highest 10 percent earned more than $52,280. Median annual earnings of respiratory therapy technicians employed in general medical and surgical hospitals were $36,990 in May 2004.

**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, and radiation therapists.

**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 75063-4706. Internet: [http://www.aarc.org](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, 35 East Wacker Dr., Suite 1970., Chicago, IL 60601. Internet: [http://www.caahep.org](http://www.caahep.org)

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

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**Speech-Language Pathologists**

(O*NET 29-1127.00)

**Significant Points**

- About half work in educational services, and 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.
- Employment is expected to grow because the expanding population in older age groups is prone to medical conditions that result in speech, language, and swallowing problems.
- Excellent job opportunities are expected.

**Nature of the Work**

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

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 qualitative and quantitative assessment methods, including standardized tests, as well as special instruments, to analyze and diagnose the nature and extent of speech, language, and swallowing 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 these individuals how to make sounds, improve their voices, or increase their oral or written
Most speech-language pathologists work 40 hours per week; about 1 in 5 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**

In 2005, 47 States required speech-language pathologists to be licensed if they worked in a health care setting, and all States required a master’s degree or equivalent. A passing score on the national examination on speech-language pathology, offered through the Praxis Series of the Educational Testing Service, is needed as well. Other requirements typically are 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 11 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 temporary teaching license or certificate to bachelor’s degree applicants, but a master’s degree must be earned in 3 to 5 years. A few States grant a full teacher’s certificate or license to bachelor’s degree applicants.

In 2004, 239 colleges and universities offered graduate programs in speech-language pathology that are 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. Courses cover the anatomy, physiology, and the development of the areas of the body involved in speech, language, and swallowing; the nature of disorders; 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.

Speech-language pathologists can acquire the Certificate of Clinical Competence in Speech-Language Pathology (CCC-SLP) offered by the American Speech-Language-Hearing Association. To earn a CCC, a person must have a graduate degree and 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 (ETS).

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.

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 96,000 jobs in 2004. About half were employed in educational services, primarily in 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
Employment of speech-language pathologists is expected to grow about as fast as the average for all occupations through the year 2014. 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 are also improving the survival rate of premature infants and trauma and stroke victims, who then need assessment and possible treatment. An increased emphasis also has been placed on early identification of speech and language problems in young children. 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.

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

Employment in educational services will increase along with 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 will also increase employment.

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

Earnings
Median annual earnings of speech-language pathologists were $52,410 in May 2004. The middle 50 percent earned between $42,090 and $65,750. The lowest 10 percent earned less than $34,720, and the highest 10 percent earned more than $82,420. Median annual earnings in the industries employing the largest numbers of speech-language pathologists in May 2004 were:

<table>
<thead>
<tr>
<th>Industry</th>
<th>Median Annual Earnings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offices of other health practitioners..</td>
<td>$57,240</td>
</tr>
<tr>
<td>General medical and surgical hospitals</td>
<td>55,900</td>
</tr>
<tr>
<td>Elementary and secondary schools</td>
<td>48,320</td>
</tr>
</tbody>
</table>

According to a 2003 survey by the American Speech-Language-Hearing Association, the median annual salary for full-time certified speech-language pathologists who worked on a calendar-year basis, generally 11 or 12 months annually, was $48,000. Certified speech-language pathologists who worked 25 or fewer hours per week had a median hourly salary of $40.00. Starting salaries for certified speech-language pathologists with one to three years of experience were $42,000 for those who worked on a calendar-year. According to a 2004 survey by the American Speech-Language-Hearing Association, the median annual salary for speech-language pathologists in schools was $50,000 for those employed on an academic year basis (usually 9 or 10 months).

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:


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 very good job opportunities.
- About 1 out of 5 veterinarians was self-employed; self-employed veterinarians usually have to work hard and long to build a sufficient client base.

Nature of the Work
Veterinarians play a major role in the healthcare of pets, livestock, and zoo, sporting, and laboratory animals. 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 the scope of fundamental theoretical knowledge, and in applied research, developing new ways to use knowledge.

Most veterinarians perform clinical work in private practices. More than 50 percent of these veterinarians 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, 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, sheep, and some non-domestic animals in addition to companion animals. Veterinarians in clinical practice 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.

A small number of private-practice veterinarians work exclusively with large animals, mostly horses or cows; 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. Veterinarians euthanize animals when necessary. Other veterinarians care for zoo, aquarium, or laboratory animals.

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 can 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 at various levels. Veterinarians who are livestock inspectors check animals for transmissible diseases, 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 government regulations regarding food purity and sanitation.

Working Conditions
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. The work setting often can be noisy.

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. When working with animals that are frightened or in pain, veterinarians risk being bitten, kicked, or scratched.

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. In these cases, veterinarians enjoy clean, well-lit offices or laboratories and spend much of their time dealing with people rather than animals.

Training, Other Qualifications, and Advancement
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 and must obtain a license to practice. 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 vary. Many of these colleges 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. Applicants without a bachelor’s degree face a difficult task gaining admittance.

Prevetinary courses emphasize the sciences. Veterinary medical colleges typically require 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 precalculus. Most veterinary medical colleges also require core courses, including some in English or literature, the social sciences, and the humanities. Increasingly, courses in practice management and career development are becoming a standard part of the curriculum, to provide a foundation of general business knowledge for new graduates.

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.

In admittance decisions, 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 is helpful. Students must demonstrate ambition and an eagerness to work with animals.

There is keen competition for admission to veterinary school. The number of accredited veterinary colleges has remained largely the same since 1983, whereas the number of applicants has risen significantly. Only about 1 in 3 applicants was accepted in
2004. AVMA-recognized veterinary specialties—such as pathology, internal medicine, dentistry, nutrition, ophthalmology, surgery, radiology, preventive medicine, and laboratory animal medicine—are usually in the form of a 2-year internship. Interns receive a small salary but usually find that their internship experience leads to a higher beginning salary, relative to those of other starting veterinarians. Veterinarians who seek board certification in a specialty also must complete a 3- to 4-year residency program that provides intensive training in specialties such as internal medicine, oncology, radiology, surgery, dermatology, anesthesiology, neurology, cardiology, ophthalmology, and exotic small-animal medicine.

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 Educational Commission for Foreign Veterinary Graduates (ECFVG) grants certification to individuals trained outside the United States who demonstrate that they meet specified requirements for the English language and for clinical proficiency. ECFVG certification fulfills the educational requirement for licensure in all States. Applicants for licensure satisfy the examination requirement by passing the North American Veterinary Licensing Exam (NAVLE), an 8-hour computer-based examination consisting of 360 multiple-choice questions covering all aspects of veterinary medicine. Administered by the National Board of Veterinary Medical Examiners (NBVME), the NAVLE includes visual materials designed to test diagnostic skills and constituting 10 percent of the total examination.

The majority of 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, making it difficult for a veterinarian to practice in a different State without first taking that State’s examination. 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.

Most veterinarians begin as employees in established practices. Despite the substantial financial investment in equipment, office space, and staff, many veterinarians with experience 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.

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 tend to form a strong bond with their pet. 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 promote, market, and sell their services.

Employment
Veterinarians held about 61,000 jobs in 2004. About 1 out of 5 veterinarians was self-employed in a solo or group practice. Most others were salaried employees of another veterinary practice. The Federal Government employed about 1,200 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. (See the statement on teachers—postsecondary elsewhere in the Handbook.)

Job Outlook
Employment of veterinarians is expected to increase as fast as the average for all occupations over the 2004–14 projection period. Despite this average growth, very good job opportunities are expected because the 28 schools of veterinary medicine, even at full capacity, result in a limited number of graduates each year. However, as mentioned earlier, there is keen competition for admission to veterinary school. As pets are increasingly viewed as a member of the family, pet owners will be more willing to spend on advanced veterinary medical care, creating further demand for veterinarians.

Most veterinarians 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.

Pet owners are becoming more aware of the availability of advanced care and are more willing to pay for intensive veterinary care than in the past because many pet owners are more affluent and because they consider their pet part of the family. More pet owners even purchase pet insurance, increasing the likelihood that a considerable amount of money will be spent on veterinary care for their pets. More pet owners also will take advantage of nontraditional veterinary services, such as preventive dental care.

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. This situation will not necessarily limit the ability of veterinarians to find employment or to set up and maintain a practice in a particular area. Rather, 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 that for veterinarians in private practice who care for companion animals. Nevertheless, job prospects may be better for veterinarians who specialize in farm animals than for companion-animal practitioners because of low earnings in the former specialty and because many veterinarians do not want to work in rural or isolated areas.

Continued support for public health and food safety, national disease control programs, and biomedical research on human health problems will contribute to the demand for veterinarians, although positions in these areas of interest are few in number. Homeland security also may provide opportunities for veterinarians involved in efforts to minimize animal diseases and prevent them from entering the country. Veterinarians with training in food safety, 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 $66,590 in May 2004. The middle 50 percent earned between $51,420 and
$88,060. The lowest 10 percent earned less than $39,020, and the highest 10 percent earned more than $118,430.

According to a survey by the American Veterinary Medical Association, average starting salaries of veterinary medical college graduates in 2004 varied by type of practice as follows:

<table>
<thead>
<tr>
<th>Practice Type</th>
<th>Average Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small animals, predominantly</td>
<td>$50,878</td>
</tr>
<tr>
<td>Small animals, exclusively</td>
<td>50,703</td>
</tr>
<tr>
<td>Large animals, exclusively</td>
<td>50,403</td>
</tr>
<tr>
<td>Private clinical practice</td>
<td>49,635</td>
</tr>
<tr>
<td>Large animals, predominantly</td>
<td>48,529</td>
</tr>
<tr>
<td>Mixed animals</td>
<td>47,704</td>
</tr>
<tr>
<td>Equine (horses)</td>
<td>38,628</td>
</tr>
</tbody>
</table>

The average annual salary for veterinarians in the Federal Government in nonsupervisory, supervisory, and managerial positions was $78,769 in 2005.

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, similar to the work of biological scientists and medical scientists.

Animal care and service workers and veterinary technologists and technicians 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 60173-4360. Internet: http://www.avma.org

For information on veterinary education, write to:

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

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 tollfree, and charges may result.