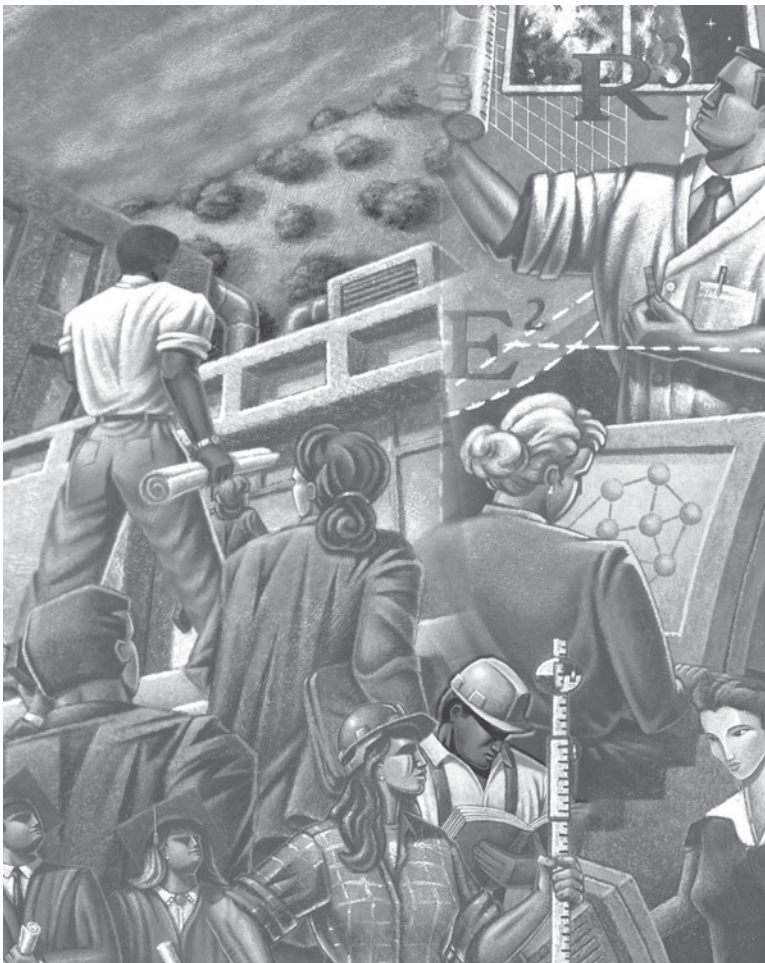


Health Diagnosing and Treating Practitioners



Reprinted from the
Occupational Outlook Handbook, 2004-05 Edition

U.S. Department of Labor
Bureau of Labor Statistics



Occupations Included in this Reprint

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

Audiologists

(0*NET 29-1121.00)

Significant Points

- Employment of audiologists is expected to grow rapidly because the expanding population in older age groups is prone to medical conditions that result in hearing problems.
- More than half worked in healthcare facilities, and most others were employed by educational services.
- A master's degree in audiology is currently the standard credential; however, a clinical doctoral degree is expected to become the new standard.

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 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 or balance problems on an individual's daily life. 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, fitting and tuning cochlear implants, and audiologic rehabilitation. Audiologic rehabilitation emphasizes counseling on adjusting to hearing loss, training on the use of hearing instruments, and teaching communication strategies for use in a variety of listening environments. For example, they may provide instruction in lip reading. Audiologists also may recommend, fit, and dispense personal or large area amplification systems and alerting devices.

Audiologists provide direct clinical services to individuals with hearing or balance disorders. In audiology (hearing) clinics, they may independently develop and carry out treatment programs. Audiologists, in a variety of settings, work with other health professionals as a team in planning and implementing services for children and adults, from birth to old age. Audiologists keep records on the initial evaluation, progress, and discharge of clients. These records help pinpoint problems, track client progress, and justify the cost of treatment when applying for reimbursement.

Some audiologists specialize in work with the elderly, children, or hearing-impaired individuals who need special therapy programs. Others develop and implement ways to protect workers' ear 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.

Audiologists may 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 clients 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.

Employment

Audiologists held about 11,000 jobs in 2002. More than half of all jobs were in offices of physicians; hospitals; offices of other health practitioners, including audiologists; and outpatient care centers. About 1 in 5 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 healthcare services in their own offices or worked under contract for schools, healthcare facilities, or other establishments.

Training, Other Qualifications, and Advancement

Of the 48 States that require a license to practice audiology, almost all require that individuals have a master's degree in audiology or the equivalent; however, a clinical doctoral degree is expected to become the new standard. A passing score on a national examination on audiology offered through the Praxis Series of the Educational Testing Service is needed, as well. Other requirements are 300 to 375 hours of supervised clinical experience and 9 months of postgraduate professional clinical experience. An additional examination may be required in order to dispense hearing aids. Forty States have continuing education requirements for licensure renewal. Medicaid, medi-



Audiologists provide direct clinical services to individuals with hearing or balance disorders.

care, and private health insurers generally require practitioners to be licensed to qualify for reimbursement.

About 107 colleges and universities offer graduate programs in audiology in the United States. About 39 of these offer a Doctor of Audiology (Au.D.) degree. Requirements for admission to programs in audiology include courses in English, mathematics, physics, chemistry, biology, psychology, and communication sciences. 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 the year 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 clients. They must be able to approach problems objectively and provide support to clients and their families. Because a client's progress may be slow, patience, compassion, and good listening skills are necessary.

Job Outlook

Employment of audiologists is expected to grow faster than the average for all occupations through the year 2012. Because hearing loss is strongly associated with aging, rapid growth in the population age 55 and over will cause the number of persons with hearing impairment to increase markedly. In addition, members of the baby boom generation are now entering middle age, when the possibility of neurological disorders and associated hearing 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. Many 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. 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 hearing disorders will also increase employment.

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. 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 \$48,400 in 2002. The middle 50 percent earned between \$39,510 and \$58,430. The lowest 10 percent earned less than \$32,500, and the highest 10 percent earned more than \$73,130.

According to a 2003 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 \$52,000. For those who worked on an academic-year basis, usually 9 or 10 months annually, the median annual salary was \$47,500. The median starting salary for certified audiologists with one to three years experience was \$43,000 on a calendar-year basis. Certified audiologists who worked 25 or fewer hours per week had a median hourly salary of \$28.00.

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 Speech-Language-Hearing Association, 10801 Rockville Pike, Rockville, MD 20852. Internet: <http://www.asha.org>
- ▶ Academy of Audiology, 11730 Plaza America Dr., Suite 300, Reston, VA 20190. Internet: <http://www.audiology.org>

Chiropractors

(0*NET 29-1011.00)

Significant Points

- Chiropractors must be licensed, requiring 2 to 4 years of undergraduate education, completion of a 4-year chiropractic college course, and passing scores on national and State examinations.
- Employment is expected to increase faster than average as a result of research and changing attitudes about alternative healthcare practices.
- Job prospects should be good; establishing a new practice will be easiest in areas with a low concentration of chiropractors.
- As with other types of independent practice, earnings for chiropractors 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 healthcare 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, 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

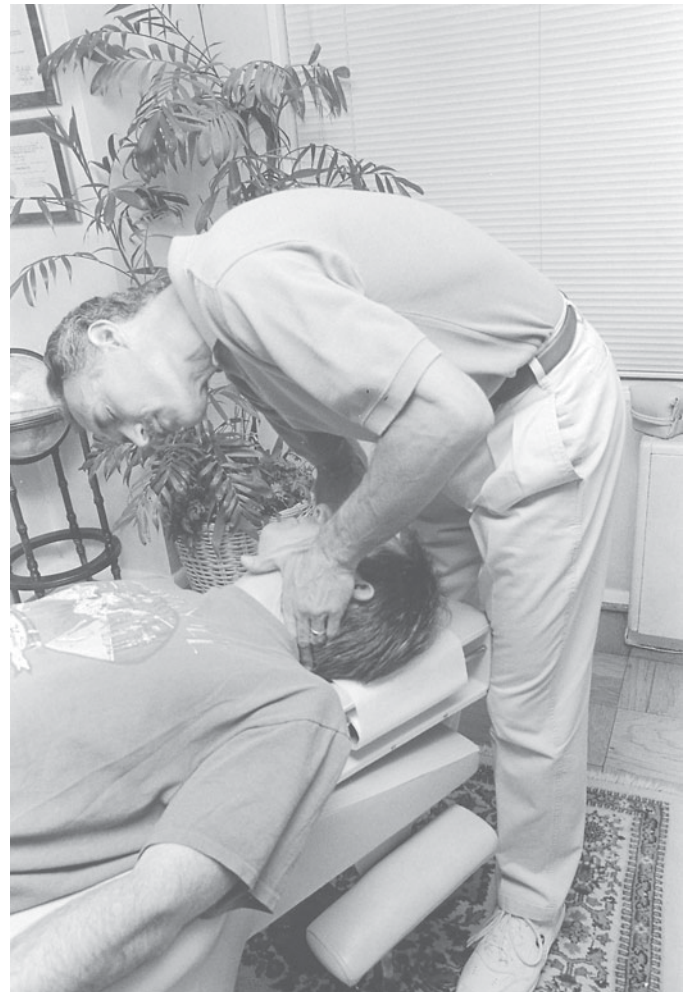
Chiropractors work in clean, comfortable offices. Their average workweek is about 40 hours, although longer hours are not uncommon. Solo practitioners set their own hours, but may work evenings or weekends to accommodate patients.

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.

Employment

Chiropractors held about 49,000 jobs in 2002. 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. There are geographic imbalances in the distribution of chiropractors, in part because many establish practices close to chiropractic institutions.



A chiropractor manually adjusts the spine to relieve pressure.

Training, Other Qualifications, and Advancement

All States and the District of Columbia regulate the practice of chiropractic and grant licenses to chiropractors who meet 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.

To maintain licensure, almost all States require the completion of a specified number of hours of continuing education each year. Chiropractic associations and accredited chiropractic programs and institutions offer continuing education programs. Specialty councils within some chiropractic associations also offer programs leading to clinical specialty certification, called "diplomate" certification, in areas such as orthopedics, neurology, sports injuries, occupational and industrial health, nutrition, diagnostic imaging, thermography, and internal disorders.

In 2003, 16 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.

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 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 healthcare facility.

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 2012 as consumer demand for alternative healthcare grows. Chiropractors emphasize the importance of healthy lifestyles and do not prescribe drugs or perform surgery. As a result, 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 healthcare 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 also is related to the ability of patients to pay, either directly or through health insurance. Although more insurance plans now cover chiropractic services, the extent of such coverage varies among plans. 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 \$65,330 in 2002. The middle 50 percent earned between \$44,140 and \$102,400 a year.

Self-employed chiropractors usually earn more than salaried chiropractors. According to the American Chiropractic Association, in 2000, the average income for all chiropractors, including the self-employed, was about \$81,500 after expenses. 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 for their own health insurance and retirement.

Related Occupations

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

Sources of Additional Information

General information on chiropractic as a career is available from:

- ▶ American Chiropractic Association, 1701 Clarendon Blvd., Arlington, VA 22209. Internet: <http://www.amerchiro.org>
- ▶ International Chiropractors Association, 1110 North Glebe Rd., Suite 1000, Arlington, VA 22201. Internet: <http://www.chiropractic.org>
- ▶ World Chiropractic Alliance, 2950 N. Dobson Rd., Suite 1, Chandler, AZ 85224-1802.
- ▶ Dynamic Chiropractic, P.O. Box 40109, Huntington, CA 92605-4109.

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

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

For information on State education and licensure requirements, contact:

► Federation of Chiropractic Licensing Boards, 901 54th Ave., Suite 101, Greeley, CO 80634-4400. Internet: <http://www.fclb.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

(0*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 more slowly than 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*, operate 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 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. A considerable number 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.

Employment

Dentists held about 153,000 jobs in 2002. About 2 in 5 dentists were self-employed. Almost all dentists work in private practice. According to the American Dental Association (ADA), about 80 percent of dentists in private practice are sole proprietors, and 13 percent belong to a partnership. A small number of salaried dentists work in hospitals and offices of physicians.

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, a candidate must graduate from one of the 55 dental schools accredited by the ADA's Commission on Dental Accreditation in 2002 and also 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 course work 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 small number of 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



Most dentists are general practitioners, handling a variety of dental needs.

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).

Currently, about 17 States license or certify dentists who intend 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.

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.

Some dental school graduates work for established dentists as associates for a year or two in order 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. According to the ADA, each year about 12 percent of new graduates enroll in postgraduate training programs to prepare for a dental specialty.

Job Outlook

Employment of dentists is expected to grow more slowly than the average for all occupations through 2012. Although employment growth will provide some job opportunities, most jobs will result from the need to replace the large number of dentists projected 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 2012. As members of the baby-boom generation advance into middle age, a large number will need maintenance on 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, because, as their practices expand, dentists are likely to hire more dental hygienists and dental assistants to handle routine services.

Dental care will focus more on prevention, including teaching people how to take better care of their teeth. Dentists will increasingly provide care that is 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 \$123,210 in 2002. 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 salaried dentists. 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. So do chiropractors, optometrists, physicians and surgeons, podiatrists, psychologists, and veterinarians.

Sources of Additional Information

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

► American Dental Association, Commission on Dental Accreditation, 211 E. Chicago Ave., Chicago, IL 60611. Internet: <http://www.ada.org>

For information on admission to dental schools, contact:

► American Dental Education Association, 1625 Massachusetts Ave. NW., Suite 600, Washington, DC 20036. Internet: <http://www.adea.org>

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

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

Dietitians and Nutritionists

(0*NET 29-1031.00)

Significant Points

- Most jobs were 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.
- 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.

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 healthcare professionals in order to coordinate medical and nutritional needs. Some clinical dietitians specialize in the management of overweight patients or 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 healthcare 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 healthcare facilities or in their own private practice. They perform nutri-

tion screenings for their clients and offer advice on diet-related concerns such as weight loss or 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

In 2002, most full-time dietitians and nutritionists worked a regular 40-hour week, although some worked weekends. About 1 in 4 worked part time.

Dietitians and nutritionists usually work in clean, well-lit, 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.

Employment

Dietitians and nutritionists held about 49,000 jobs in 2002. 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 which includes firms that provide 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 healthcare 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 individual clients.

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. Col-



Dietitians and nutritionists usually work in clean, well-lit, and well-ventilated areas.

lege 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, 30 require licensure, 15 require certification, and 1 requires registration. The Commission on Dietetic Registration of the American Dietetic Association (ADA) awards the Registered Dietitian credential to those who pass a certification exam after completing their academic coursework and supervised experience. Because practice requirements vary by State, interested candidates should determine the requirements of the State in which they want to work before sitting for any exam.

As of 2003, there were about 230 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 coordinated program. As of 2003, 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 264 CADE-accredited/approved internships. These internships may be full-time programs lasting 6 to 12 months or part-time programs lasting 2 years. Students interested in research, advanced clinical positions, or public health may need an advanced degree.

Experienced dietitians may advance to assistant director, associate director, or director of a dietetic department or may become self-employed. Some dietitians specialize in areas such as renal or pediatric dietetics. Others may leave the occupation to become sales representatives for equipment, pharmaceutical, or food manufacturers.

Job Outlook

Employment of dietitians is expected to grow about as fast as the average for all occupations through 2012 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, nursing care facilities, schools, prisons, community health programs, and home healthcare agencies. Public interest in nutrition and increased emphasis on health education and prudent lifestyles will also 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.

On the one hand, the number of dietitian positions in nursing care facilities and in State government is expected to decline slightly, as these establishments continue to contract out food service operations. On the other hand, employment is expected to grow rapidly in contract providers of food services, outpatient care centers, and offices of physicians and other health practitioners.

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 also may be curbed by limitations on insurance reimbursement for dietetic services.

Earnings

Median annual earnings of dietitians and nutritionists were \$41,170 in 2002. The middle 50 percent earned between \$33,210 and \$49,830. The lowest 10 percent earned less than \$25,520, and the highest 10 percent earned more than \$58,700. In 2002, median annual earnings in general medical and surgical hospitals, the industry employing the largest number of dietitians and nutritionists, were \$41,910.

According to the American Dietetic Association, median annual income for registered dietitians in 2002 varied by practice area as follows: \$60,000 in consultation and business; \$55,000 in food and nutrition management; \$54,800 in education and research; \$44,000 in clinical nutrition/ambulatory care; \$43,300 in clinical nutrition/long-term care; \$43,200 in community nutrition; and \$40,800 in clinical nutrition/acute care. Salaries also vary by years in practice, educational level, geographic region, and size of the community.

Related Occupations

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

Sources of Additional Information

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

► The American Dietetic Association, 120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995. Internet: <http://www.eatright.org>

Occupational Therapists

(0*NET 29-1122.00)

Significant Points

- Employment is projected to increase faster than the average, as rapid growth in the number of middle-aged and elderly individuals increases the demand for therapeutic services.
- A bachelor's degree in occupational therapy is the minimum educational requirement; beginning in 2007, however, a master's degree or higher will be required.
- Occupational therapists are increasingly taking on supervisory roles.
- More than a quarter of occupational therapists work part time.

Nature of the Work

Occupational therapists (OTs) help people improve their ability to perform tasks in their daily living and working environments. They work with individuals who have conditions that are mentally, physically, developmentally, or emotionally disabling. They also help them to develop, recover, or maintain daily living and work skills. Occupational therapists help clients not only to improve their basic motor functions and reasoning abilities, but also to compensate for permanent loss of function. Their goal is to help clients have independent, productive, and satisfying lives.

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, splints, 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. 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.

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 healthcare providers.

Working Conditions

Occupational therapists in hospitals and other healthcare and community settings usually worked a 40-hour week. Those in schools may participate in meetings and other activities during and after the school day. In 2002, 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 healthcare 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. Due to rising healthcare 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.



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

Employment

Occupational therapists held about 82,000 jobs in 2002. About 1 in 10 occupational therapists held more than one job. The largest number of jobs was in hospitals. Other major employers were offices of other health practitioners (which includes offices of occupational therapists), public and private educational services, and nursing care facilities. Some occupational therapists were employed by home healthcare 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 daycare programs, and home healthcare agencies.

Training, Other Qualifications, and Advancement

Currently, a bachelor's degree in occupational therapy is the minimum requirement for entry into this 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 should complete their coursework and fieldwork before 2007. All States, Puerto Rico, 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)."

In 2003, entry-level education was offered in 38 bachelor's degree programs, 3 postbaccalaureate certificate programs for students with a degree other than occupational therapy, and 86 entry-level master's degree programs. There were 48 programs that 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 also offer weekend or part-time programs.

Occupational therapy coursework includes physical, biological, and behavioral sciences and the application of occupational therapy theory and skills. 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 healthcare field.

Occupational therapists need patience and strong interpersonal skills to inspire trust and respect in their clients. Ingenuity and imagination in adapting activities to individual needs are assets. Those working in home healthcare services must be able to adapt to a variety of settings.

Job Outlook

Employment of occupational therapists is expected to increase faster than the average for all occupations through 2012. The impact of proposed Federal legislation imposing limits on reimbursement for therapy services may adversely affect the job market for occupational therapists in the near term. 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 the 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 the demand for therapeutic services. In addition, medical advances now enable more patients with critical problems to survive—patients who ultimately may need extensive therapy.

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

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

Earnings

Median annual earnings of occupational therapists were \$51,990 in 2002. The middle 50 percent earned between \$42,910 and \$61,620. The lowest 10 percent earned less than \$35,130, and the highest 10 percent earned more than \$74,390. Median annual earnings in the industries employing the largest numbers of occupational therapists in 2002 were as follows:

Offices of other health practitioners	\$53,660
Nursing care facilities	53,930
General medical and surgical hospitals	53,210
Elementary and secondary schools	45,740

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>

Optometrists

(0*NET 29-1041.00)

Significant Points

- Licensed optometrists must earn a Doctor of Optometry degree from an accredited optometry school and pass a written and a clinical State board examination.
- Admission to optometry school is competitive.
- Optometrists usually remain in practice until they retire, so relatively few job openings arise from the need to replace those who leave the occupation.

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 post-operative care to cataract patients, as well as patients who have had laser vision correction or other eye surgery. They also diagnose conditions due to 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, and 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 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.

Employment

Optometrists held about 32,000 jobs in 2002. 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 two-thirds of practicing optometrists are in private practice. Although many optometrists practice alone, a growing number are in a partnership or group practice.

Salaried jobs for optometrists were primarily in offices of other health practitioners, including optometrists; offices of physicians, including ophthalmologists; or health and personal care stores, including optical goods stores. A small number of salaried jobs for optometrists were in hospitals; the Federal government; or outpatient care centers, including health maintenance organizations. Almost a third of optometrists were self-employed.

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 pass both a written and a clinical State board examination. In many States, applicants can substitute the examinations of the National Board of Examiners in Optometry, usually taken during the student's academic career, for part or all of the written examination. 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 2002, 17 U.S. schools and colleges of optometry held an accredited status with 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. Since 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 as well. Applicants must take the Optometry



Most optometrists are private practitioners who also handle the business aspects of running an office.

Admissions Test, which measures academic ability and scientific comprehension. 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 small number of applicants are accepted to optometry school after 3 years of college and complete their bachelor's degree while attending optometry school. Admission to optometry school is competitive.

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.

Optometrists wishing to teach or do research may study for a master's or Ph.D. degree in visual science, physiological optics, neurophysiology, public health, health administration, health information and communication, or health education. One-year postgraduate clinical residency programs are available for optometrists who wish to specialize in family practice optometry, pediatric optometry, geriatric optometry, vision therapy, contact lenses, hospital-based optometry, primary care optometry, or ocular disease.

Job Outlook

Employment of optometrists is expected to grow about as fast as the average for all occupations through 2012, 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, rising personal incomes, and growth in employee vision care plans will spur employment growth, as well.

Employment of optometrists would grow more rapidly were it not for anticipated productivity gains that will allow each optometrist to see more patients. These expected gains stem from greater use 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, but expensive. Optometrists will still be needed to perform preoperative and postoperative care for laser surgery; however, 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 leave the occupation will create employment opportunities. Relatively few opportunities from this source are expected, however, because optometrists usually continue to practice until they retire; few transfer to other occupations.

Earnings

Median annual earnings of salaried optometrists were \$86,090 in 2002. The middle 50 percent earned between \$62,030 and \$115,550. Median annual earnings of salaried optometrists in 2002 were \$87,070 in offices of other health practitioners. Salaried optometrists tend to earn more initially than do optometrists who set up their own independent practice. 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 \$110,000 in 2002. The middle 50 percent earned between \$82,500 and \$156,500.

Related Occupations

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

Sources of Additional Information

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

► Association of Schools and Colleges of Optometry, 6110 Executive Blvd., Suite 510, Rockville, MD 20852. Internet: <http://www.opted.org>

Additional career information is available from:

► American Optometric Association, Educational Services, 243 North Lindbergh Blvd., St. Louis, MO 63141-7881. Internet: <http://www.aoanet.org>

The Board of Optometry in each State can supply information on licensing requirements.

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

Pharmacists

(0*NET 29-1051.00)

Significant Points

- Pharmacists are becoming more involved in drug therapy decisionmaking and patient counseling.
- A license is required; one must graduate from an accredited college of pharmacy and pass a State examination.
- Very good employment opportunities are expected.
- Earnings are very high, but some pharmacists work long hours, nights, weekends, and holidays.

Nature of the Work

Pharmacists dispense 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 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. Traditionally, most pharmacists work in a community setting, such as a retail drugstore, or in a healthcare 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 diet, exercise, or stress management, or about durable medical equipment and home healthcare supplies. 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 are also certified to administer vaccinations.

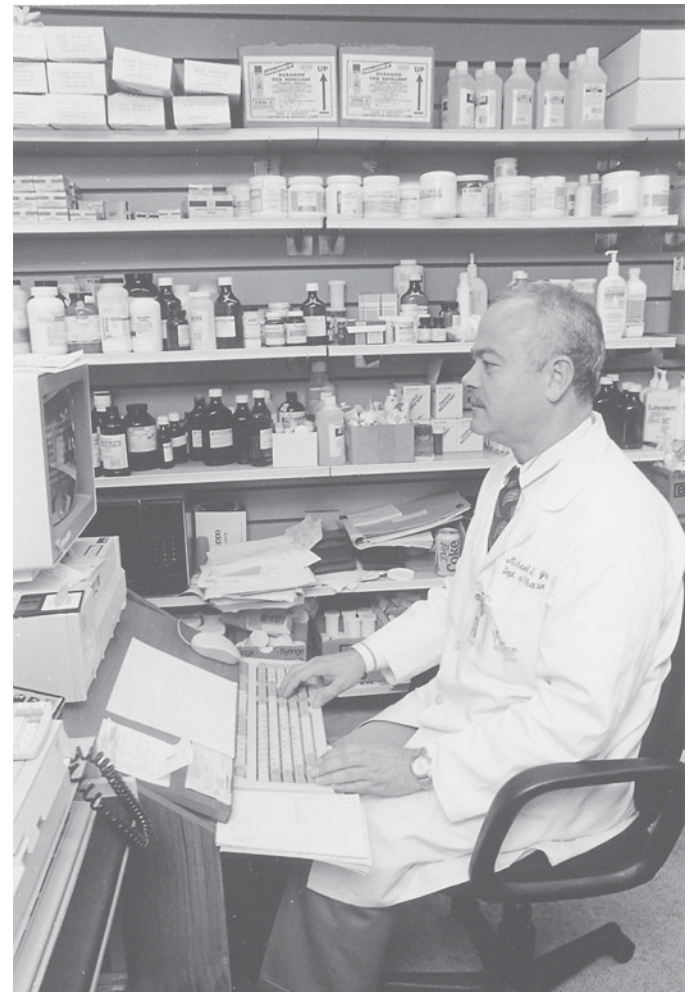
Pharmacists in healthcare facilities dispense medications and advise the medical staff on the selection and effects of drugs. They may make sterile solutions and buy medical supplies. They also assess, plan, and monitor drug programs or regimens. They counsel patients on the use of drugs while in the hospital, 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 healthcare 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 with drugs).

Most pharmacists keep confidential computerized records of patients' drug therapies to ensure that harmful drug interactions do not occur. 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. They also frequently oversee pharmacy students serving as interns in preparation for graduation and licensure.

Increasingly, pharmacists pursue 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 also work for health insurance companies, developing pharmacy benefit packages and carrying out cost-benefit analyses on certain drugs. Other pharmacists work for the government and pharmacy associations. Finally, some pharmacists are employed full time or part time as



Pharmacists must check records to ensure that patients are not allergic to new medications.

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 potentially 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 evenings, nights, weekends, and holidays. Consultant pharmacists may travel to nursing homes or other facilities to monitor patients' drug therapy.

About 19 percent of pharmacists worked part time in 2002. Most full-time salaried pharmacists worked about 40 hours a week. Some, including many self-employed pharmacists, worked more than 50 hours a week.

Employment

Pharmacists held about 230,000 jobs in 2002. About 62 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 22 percent of salaried pharmacists work in hospitals, and others work in clinics, mail-order pharmacies, pharmaceutical wholesalers, home healthcare agencies, or the Federal Government.

Training, Other Qualifications, and Advancement

A license to practice pharmacy is required in all States, the District of Columbia, and U.S. territories. To obtain a license, one must graduate from a college of pharmacy accredited by the American Council on Pharmaceutical Education (ACPE) and pass an examination. All States except California require the North American Pharmacist Licensure Exam (NAPLEX) and the Multistate Pharmacy Jurisprudence Exam (MPJE), both administered by the National Association of Boards of Pharmacy. California has its own pharmacist licensure exam. 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 re-examination to qualified pharmacists already licensed by another State. In Florida, re-examination is not required if a pharmacist passed the NAPLEX and MPJE within 12 years of his or her application for license transfer. Many pharmacists are licensed to practice in more than one State. States may require continuing education for license renewal. Persons interested in a career as a pharmacist should check with State boards of pharmacy for details on examination requirements and license transfer procedures.

In 2002, 85 colleges of pharmacy were accredited to confer degrees by the American Council on Pharmaceutical 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 the licensure examination of a State board of pharmacy. Courses offered at colleges of pharmacy are designed to teach students how to dispense prescriptions and communicate with patients and other health care providers about drug information and patient care. Students also learn professional ethics. In addition to classroom study, students in the Pharm.D. program are provided in-depth exposure to and active participation 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 offered to new students and will cease to be awarded after 2005.

The Pharm.D. is a 4-year program that requires at least 2 years of college study prior to admittance, although most applicants have 3 years prior to entering the program. 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 half of all colleges require the applicant 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 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 Pharm.D. degree programs. A total of 43 pharmacy programs participated in 2003.

In the 2002-03 academic year, 66 colleges of pharmacy awarded the master of science degree or the Ph.D. degree. Both the master's and Ph.D. degrees are awarded after completion of a Pharm.D. degree. These degrees 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 1- 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. Pharmacy fellowships are highly individualized programs designed to prepare participants to work in research laboratories. Some pharmacists who run their own pharmacy obtain a master's degree in business administration (MBA).

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

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.

Job Outlook

Very good employment opportunities are expected for pharmacists over the 2002-12 period because the number of degrees granted in pharmacy is expected to be less than the number of job openings created by employment growth and the need to replace pharmacists who retire or otherwise leave the occupation. Recently, enrollments in pharmacy programs are rising as more students are attracted by high salaries and good job prospects. Despite this increase in enrollments, pharmacist jobs 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 2012, due to the increased pharmaceutical needs of a growing elderly population and increased use of medications. The growing numbers of middle-aged and elderly people—who, on average, use more prescription drugs than do 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 by Medicare.

Community pharmacies are taking steps to manage increasing prescription volume. 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 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, as hospitals reduce inpatient stays, downsize, and consolidate departments. The increase in outpatient surgeries means more patients are discharged and purchase medications through retail, supermarket, or mail-order pharmacies, rather than through the hospital. An aging population means more pharmacy services are required in nursing homes, assisted living facilities, and home care settings, where the most rapid job growth among pharmacists is expected.

New opportunities are emerging for pharmacists in managed-care organizations, where they may analyze trends and patterns in medication use for their populations of patients, and for pharmacists trained in research, disease management, and pharmacoconomics—determining the costs and benefits of different drug therapies. Pharmacists also will have opportunities to work in research and development as well as 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.

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 services. Health insurance companies realize that the expense of using medication to treat diseases and various health conditions often is considerably less than the potential costs for patients whose conditions go untreated. Pharmacists also can reduce the expenses resulting from unexpected complications due to allergic reactions or medication interactions.

Earnings

Median annual wage and salary earnings of pharmacists in 2002 were \$77,050. The middle 50 percent earned between \$66,210 and \$87,250 a year. The lowest 10 percent earned less than \$54,110, and the highest 10 percent earned more than \$94,570

a year. Median annual earnings in the industries employing the largest numbers of pharmacists in 2002 were as follows:

Grocery stores	\$78,270
Health and personal care stores	76,800
General medical and surgical hospitals	76,620

Related Occupations

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

Sources of Additional Information

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

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

General information on careers in pharmacy is available from:

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

► National Association of Chain Drug Stores, 413 N. Lee St., P.O. Box 1417-D49, Alexandria, VA 22313-1480. Internet: <http://www.nacds.org>

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, 700 Busse Hwy., Park Ridge, IL 60068. 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

(0*NET 29-1123.00)

Significant Points

- Employment is expected to increase faster than the average, as growth in the number of individuals with disabilities or limited function spurs demand for therapy services.
- After graduating from an accredited physical therapist educational program, therapists must pass a licensure exam before they can practice.
- About two-thirds of physical therapists work either in hospitals or in offices of physical therapists.

Nature of the Work

Physical therapists (PTs) 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 treatment 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 2002, most full-time physical therapists worked a 40-hour week; some worked evenings and weekends to fit their patients' schedules. More than 1 in 5 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.

Employment

Physical therapists held about 137,000 jobs in 2002. 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 healthcare facility.

About two-thirds of jobs for physical therapists were either in hospitals or in offices of other health practitioners (which includes offices of physical therapists). Other jobs were in home healthcare 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 healthcare agencies, adult



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

daycare programs, and schools. Physical therapists also teach in academic institutions and conduct research.

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 203 accredited physical therapist programs in 2003. Of the accredited programs, 113 offered master's degrees, and 90 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.

Physical therapists should have strong interpersonal skills in order to be able to educate patients about their physical therapy treatments. PTs 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 one's licensure.

Job Outlook

Employment of physical therapists is expected to grow faster than the average for all occupations through 2012. 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. 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.

Earnings

Median annual earnings of physical therapists were \$57,330 in 2002. The middle 50 percent earned between \$48,480 and \$70,050. The lowest 10 percent earned less than \$40,200, and the highest 10 percent earned more than \$86,260. Median annual earnings in the industries employing the largest numbers of physical therapists in 2002 were as follows:

Home health care services	\$62,480
Offices of other health practitioners	58,510
Offices of physicians	57,640
Nursing care facilities	57,570
General medical and surgical hospitals	57,200

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:

► American Physical Therapy Association, 1111 North Fairfax St., Alexandria, VA 22314-1488. Internet: <http://www.apta.org>

Physician Assistants

(0*NET 29-1071.00)

Significant Points

- The typical physician assistant program lasts about 2 years and requires at least 2 years of college and some healthcare experience for admission.
- Most applicants to physician assistant programs hold a bachelor's or master's degree.
- Job opportunities should be good, particularly in rural and inner city clinics.
- Earnings are high.

Nature of the Work

Physician assistants (PAs) provide healthcare services under the supervision of physicians. 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 healthcare services, as delegated by a physician. Working as members of the healthcare team, they take medical histories, examine and treat patients, order and interpret laboratory tests and x rays, make diagnoses, and prescribe medications. 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 47 States and the District of Columbia, physician assistants may prescribe medications. PAs also may have managerial duties. Some order medical and laboratory supplies and equipment and may 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 or 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. Others 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.

Employment

Physician assistants held about 63,000 jobs in 2002. 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, almost 90 percent of certified PAs were in clinical practice in 2003.

More than half of jobs for PAs were in the offices of physicians or other health practitioners. About a quarter were in hospitals. The rest were mostly in outpatient care centers, the Federal government, educational services, and employment services.

Training, Other Qualifications, and Advancement

All States require that new PAs complete an accredited, formal education program. In 2002 there were about 133 accredited or provisionally accredited education programs for physician assistants. Sixty-eight of these programs offered a master's degree, and the rest offered either a bachelor's degree or an associate degree. Most PA graduates have at least a bachelor's degree.

Admission requirements vary, but many programs require 2 years of college and some work experience in the healthcare field. Students should take courses in biology, English, chemistry, mathematics, psychology, and the social sciences. Most applicants to PA programs hold a bachelor's or master's degree. Many PAs have backgrounds 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 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.

PA education includes classroom instruction in biochemistry, pathology, human anatomy, physiology, microbiology, clinical pharmacology, clinical medicine, geriatric and home healthcare, disease prevention, and medical ethics. Students obtain supervised clinical training in several areas, including primary care medicine, inpatient medicine, surgery, obstetrics and gynecology, geriatrics, emergency medicine, psychiatry, and pediatrics. Sometimes, PA students serve one or more of



Physician assistants conduct medical examinations under a physician's supervision.

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 Assistants National Certifying Examination, administered by the National Commission on Certification of Physician Assistants (NCCPA) and open 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 residency training 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.

Job Outlook

Employment of PAs is expected to grow much faster than the average for all occupations through the year 2012, due to anticipated expansion of the health services industry and an emphasis on cost containment, resulting in increasing utilization of PAs by physicians and healthcare 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 healthcare 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.

Besides 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 \$64,670 in 2002. The middle 50 percent earned between \$49,640 and \$77,280. The lowest 10 percent earned less than \$35,410, and the highest 10 percent earned more than \$90,350. Median annual earnings of physician assistants in 2002 were \$65,910 in

general medical and surgical hospitals and \$64,170 in offices of physicians.

According to the American Academy of Physician Assistants, median income for physician assistants in full-time clinical practice in 2003 was about \$72,457; median income for first-year graduates was about \$63,437. Income varies by specialty, practice setting, geographical location, and years of experience.

Related Occupations

Other health workers who provide direct patient care that requires a similar level of skill and training include audiologists, occupational therapists, physical therapists, and speech-language pathologists.

Sources of Additional Information

For information on a career as a physician assistant, contact:

► American Academy of Physician Assistants Information Center, 950 North Washington St., Alexandria, VA 22314-1552. Internet: <http://www.aapa.org>

For a list of accredited programs and a catalog of individual PA training programs, contact:

► Association of Physician Assistant Programs, 950 North Washington St., Alexandria, VA 22314-1552. Internet: <http://www.apap.org>

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

► National Commission on Certification of Physician Assistants, Inc., 6849-B Peachtree Dunwoody Rd., Atlanta, GA 30328. Internet: <http://www.nccpa.net>

Physicians and Surgeons

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

Significant Points

- Many physicians and surgeons work long, irregular hours; almost one-third of physicians worked 60 or more hours a week in 2002.
- 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.
- Formal education and training requirements are among the most demanding of any occupation, but earnings are among the highest.

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 healthcare.

There are two types of physicians: M.D.—Doctor of Medicine—and D.O.—Doctor of Osteopathic Medicine. M.D.s also are known as allopathic physicians. While both M.D.s and D.O.s may use all accepted methods of treatment, including drugs and surgery, D.O.s place special emphasis on the body's musculoskeletal system, preventive medicine, and holistic patient care. D.O.s are 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 internal medicine, or general pediatrics.

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

Anesthesiologists. 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 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.

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 healthcare 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 healthcare 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



Physicians practice in a variety of specialties, including general pediatrics.

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 skeletal system and associated organs. Others include neurological surgery (treatment of the brain and nervous system), ophthalmology (treatment of the eye), orthopedic 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 specialists, including allergists, cardiologists, dermatologists, emergency physicians, gastroenterologists, 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 healthcare 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-lit, sterile environments while performing surgery and often stand for long periods. Most work in hospitals or in surgical outpatient centers. Many physicians and surgeons work long, irregular hours. Almost one-third of physicians worked 60 hours or more a week in 2002. 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.

Employment

Physicians and surgeons held about 583,000 jobs in 2002; approximately 1 out of 6 was self-employed. About half of salaried physicians and surgeons were in office-based practice, and almost a quarter were employed by hospitals. Others practiced in Federal, State, and local government; educational services; and outpatient care centers.

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.

The New England and Middle Atlantic States have the highest ratio of physicians to population; the South Central 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.

Training and Other Qualifications

It takes many years of education and training to become a physician: 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 a 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 applicants' 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 the American Board of Medical Specialists or the American Osteopathic Association. There are 24 specialty boards, ranging from allergy and immunology to urology. For certification in a subspecialty, physicians usually need another 1 to 2 years of residency.

A physician's training is costly. More than 80 percent of medical students borrow money to cover their 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.

Job Outlook

Employment of physicians and surgeons will grow about as fast as the average for all occupations through the year 2012 due to continued expansion of the health services industries. The growing and aging population will drive overall growth in the demand for physician services, as consumers continue to demand high levels of care using the latest technologies, diagnostic tests, and therapies.

Demand for physicians' services is highly sensitive to changes in consumer preferences, healthcare 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 healthcare providers—such as physician assistants, nurse practitioners, optometrists, and nurse anesthetists—for some healthcare 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 favorable. 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 lower earnings potential, 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

Physicians have among the highest earnings of any occupation. According to the Medical Group Management Association's Physician Compensation and Production Survey, median total compensation for physicians in 2002 varied by specialty, as shown in table 1. 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 1. Total compensation of physicians by specialty, 2002

Anesthesiology	\$306,964
Surgery, general.....	255,438
Obstetrics/gynecology	233,061
Psychiatry	163,144
Internal medicine	155,530
Pediatrics/adolescent medicine	152,690
Family practice (without obstetrics)	150,267

SOURCE: *Medical Group Management Association, Physician Compensation and Production Report, 2003.*

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. Professionals in other occupations requiring similar skills and 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>

► American Association of Colleges of Osteopathic Medicine, 5550 Friendship Blvd., Suite 310, Chevy Chase, MD 20815-7231. Internet: <http://www.aacom.org>

For general information on physicians, contact:

► American Medical Association, Department of Communications and Public Relations, 515 N. State St., Chicago, IL 60610. Internet: <http://www.ama-assn.org>

► American Osteopathic Association, Division of Public Relations, 142 East Ontario St., Chicago, IL 60611. Internet: <http://www.aoa-net.org>

For information about various medical specialties, contact:

► American Society of Anesthesiologists, 520 N. Northwest Hwy., Park Ridge, IL 60068-2573. Internet: <http://www.asahq.org>

► American Board of Anesthesiology, 4101 Lake Boone Trail, Suite 510, Raleigh, NC 27607-7506. Internet: <http://www.abanes.org>

► Society of General Internal Medicine, 2501 M St. NW., Suite 575, Washington, DC 20037. Internet: <http://www.sгим.org>

► American Academy of Pediatrics, 141 Northwest Point Blvd., Elk Grove Village, IL 60007-1098. Internet: <http://www.aap.org>

► American Board of Obstetrics and Gynecology, 2915 Vine St., Dallas, TX 75204. Internet: <http://www.abog.org>

► American College of Obstetrics and Gynecologists, 409 12th St. SW., P.O. Box 96920, Washington, DC 20090-6920. Internet: <http://www.acog.org>

► American Psychiatric Association, 1000 Wilson Blvd., Suite 1825, Arlington, VA 22209-3901. Internet: <http://www.psych.org>

► American College of Surgeons, 633 North Saint Clair St., Chicago, IL 60611-3211. Internet: <http://www.facs.org>

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

Information on licensing is available from State boards of examiners.

Podiatrists

(0*NET 29-1081.00)

Significant Points

- Demand for podiatric care is expected to increase; however, only a limited number of job openings for podiatrists is expected because the occupation is small and most podiatrists remain in it until they retire.
- Podiatrists need a State license that requires the completion of at least 90 hours of undergraduate study, the completion of a 4-year program at a college of podiatric medicine, and in most States, a postdoctoral residency program of at least 1 year.
- Many podiatrists are solo practitioners, although more are entering partnerships with other podiatrists or other health practitioners; establishing a new practice will be most difficult in the areas surrounding colleges of podiatric medicine.
- Podiatrists enjoy very high earnings.

Nature of the Work

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

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

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

To diagnose a foot problem, podiatrists also order x rays and laboratory tests. The foot may be the first area to show signs of serious conditions such as arthritis, diabetes, and heart disease. For example, diabetics are prone to foot ulcers and 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 meet the needs of their patients.

Employment

Podiatrists held about 13,000 jobs in 2002. Most podiatrists were solo practitioners, although more are entering partnerships and multispecialty group practices. Solo practitioners were primarily unincorporated self-employed workers, although some were also incorporated wage and salary workers in offices of other health practitioners. Other podiatrists are employed in hospitals and the Federal government.

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



A podiatrist fits corrective inserts called orthotics.

licensing requirements, although many States grant reciprocity to podiatrists who are licensed in another State. Generally, the applicant must be a graduate of an accredited college of podiatric medicine and 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 1 year and continuing education for licensure 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. More than 90 percent of podiatric students have at least a bachelor's degree.

Colleges of podiatric medicine offer a 4-year program whose core curriculum is similar to that in other schools of medicine. During the first 2 years, students receive classroom instruction in basic sciences, including anatomy, chemistry, pathology, and pharmacology. Third- 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 residency program after receiving a DPM. Residency programs last from 1 to 3 years. Residents receive advanced training in podiatric medicine and surgery and serve clinical rotations in anesthesiology, internal medicine, pathology, radiology, emergency medicine, and orthopedic and general surgery. Residencies lasting more than 1 year provide more extensive training in specialty areas.

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.

Job Outlook

Employment of podiatrists is expected to grow about as fast as the average for all occupations through 2012. More people will turn to podiatrists for foot care as the number of injuries sustained by a more active and increasingly older population grows. 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 healthcare. 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 a traditional solo practice. Establishing a practice will be most difficult in the areas surrounding colleges of podiatric medicine, because podiatrists are concentrated in these locations.

Earnings

Median annual earnings of salaried podiatrists were \$94,870 in 2002. The middle 50 percent earned between \$62,500 and \$139,230 a year. According to a survey by the American Podiatric Medical Association, median net income for all podiatrists was \$134,415 in 2001. Additionally, a survey by *Podiatric Magazine* reported median net income of \$114,200 in 2003. 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 scientific knowledge to prevent, diagnose, and treat disorders and injuries include chiropractors, dentists, optometrists, physicians and surgeons, and veterinarians.

Sources of Additional Information

For information on podiatric medicine as a career, contact:

► American Podiatric Medical Association, 9312 Old Georgetown Rd., Bethesda, MD 20814-1621. Internet: <http://www.apma.org>

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

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

Recreational Therapists

(0*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.
- Recreational therapists should be comfortable working with persons who are ill or who have disabilities.
- Opportunities should be best for persons with a bachelor's degree in therapeutic recreation or in recreation with a concentration in therapeutic recreation.

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 and fitness workers, who organize recreational activities primarily for enjoyment. (Recreation and fitness workers are discussed elsewhere in the *Handbook*.)

In acute healthcare 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 recreation 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 daycare, 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



With a variety of techniques, including the use of arts and crafts, recreational therapists treat clients and maintain their well-being.

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.

Employment

Recreational therapists held about 27,000 jobs in 2002. About a third of salaried jobs for therapists were in nursing care facilities and almost another third were in hospitals. Others worked in State and local government agencies and in community care facilities for the elderly, including assisted-living facilities. The rest worked primarily in residential mental retardation, mental health, and substance abuse facilities; individual and family services; Federal government agencies; educational services; and outpatient care centers. Only a small number of therapists were self-employed, generally contracting with long-term care facilities or community agencies to develop and oversee programs.

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 healthcare-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 140 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.

Most employers prefer to hire candidates who are certified therapeutic recreation specialists. The National Council for Therapeutic Recreation Certification is the certifying 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.

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.

Job Outlook

Overall employment of recreational therapists is expected to grow more slowly than the average for all occupations through the year 2012. 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—for example, community care facilities for the elderly (which includes assisted-living facilities); residential mental retardation, mental health, and substance abuse facilities; and individual and family services (which includes daycare 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.

Health services facilities will support a growing number of jobs in adult daycare and outpatient programs offering short-term mental health and alcohol or drug abuse services. Rehabilitation, home healthcare, 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 daycare programs, and other social assistance agencies. Continued growth also is expected in community residential care facilities, as well as daycare programs for individuals with disabilities.

Earnings

Median annual earnings of recreational therapists were \$30,540 in 2002. The middle 50 percent earned between \$23,180 and \$38,620. The lowest 10 percent earned less than \$18,130, and the highest 10 percent earned more than \$47,180. In 2002, median annual earnings for recreational therapists were \$25,010 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 and fitness workers, and rehabilitation counselors.

Sources of Additional Information

For information on how to order materials describing careers and academic programs in recreational therapy, contact either of the following sources:

► American Therapeutic Recreation Association, 1414 Prince St., Suite 204, Alexandria, VA 22314-2853. Internet: <http://www.atra-tr.org>

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

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

Information on certification may be obtained from:

► National Council for Therapeutic Recreation Certification, 7 Elmwood Dr., New City, NY 10956. Internet: <http://www.nctrc.org>

Registered Nurses

(0*NET 29-1111.00)

Significant Points

- Registered nurses constitute the largest healthcare occupation, with 2.3 million jobs.
- More new jobs are expected to be created for registered nurses than for any other occupation.
- Job opportunities are expected to be very good.
- The three major educational paths to registered nursing are a bachelor's degree, an associate degree, and a diploma.

Nature of the Work

Registered nurses (RNs) work to promote health, prevent disease, and help patients cope with illness. They are advocates and health educators for patients, families, and communities. When providing direct patient care, they observe, assess, and record symptoms, reactions, and progress in patients; assist physicians during surgeries, treatments, and examinations; administer medications; and assist in convalescence and rehabilitation. RNs also develop and manage nursing care plans, instruct patients and their families in proper care, and help individuals and groups take steps to improve or maintain their health. While State laws govern the tasks that RNs may perform, it is usually the work setting that determines their daily job duties.

Hospital nurses form the largest group of nurses. Most are staff nurses, who provide bedside nursing care and carry out medical regimens. They also may supervise licensed practical nurses and nursing aides. Hospital nurses usually are assigned to one department, such as surgery, maternity, pediatrics, the emergency room, intensive care, or the treatment of cancer patients. Some may rotate among departments.

Office nurses care for outpatients in physicians' offices, clinics, ambulatory surgical centers, and emergency medical centers. They prepare patients for, and assist with, examinations; administer injections and medications; dress wounds and incisions; assist with minor surgery; and maintain records. Some also perform routine laboratory and office work.

Nursing care facility nurses manage care for residents with conditions ranging from a fracture to Alzheimer's disease. Although they often spend much of their time on administrative and supervisory tasks, RNs also assess residents' health, develop treatment plans, supervise licensed practical nurses and nursing aides, and perform invasive procedures, such as starting intravenous fluids. They also work in specialty-care departments, such as long-term rehabilitation units for patients with strokes and head injuries.

Home health nurses provide nursing services to patients at home. RNs assess patients' home environments and instruct patients and their families. Home health nurses care for a broad range of patients, such as those recovering from illnesses and accidents, cancer, and childbirth. They must be able to work independently and may supervise home health aides.

Public health nurses work in government and private agencies, including clinics, schools, retirement communities, and other community settings. They focus on populations, working with individuals, groups, and families to improve the overall health of communities. They also work with communities to help plan and implement programs. Public health nurses in-

struct individuals, families, and other groups regarding health issues such as preventive care, nutrition, and childcare. They arrange for immunizations, blood pressure testing, and other health screening. These nurses also work with community leaders, teachers, parents, and physicians in community health education.

Occupational health nurses, also called *industrial nurses*, provide nursing care at worksites to employees, customers, and others with injuries and illnesses. They give emergency care, prepare accident reports, and arrange for further care if necessary. They also offer health counseling, conduct health examinations and inoculations, and assess work environments to identify potential or actual health problems.

Head nurses or *nurse supervisors* direct nursing activities, primarily in hospitals. They plan work schedules and assign duties to nurses and aides, provide or arrange for training, and visit patients to observe nurses and to ensure that the patients receive proper care. They also may ensure that records are maintained and equipment and supplies are ordered.

At the advanced level, *nurse practitioners* provide basic, primary healthcare. They diagnose and treat common acute illnesses and injuries. Nurse practitioners also can prescribe medications—but certification and licensing requirements vary by State. Other advanced practice nurses include *clinical nurse specialists*, *certified registered nurse anesthetists*, and *certified nurse midwives*. Advanced practice nurses must meet educational and clinical practice requirements beyond the basic nursing education and licensing required of all RNs.

Working Conditions

Most nurses work in well-lit, comfortable healthcare facilities. Home health and public health nurses travel to patients' homes, schools, community centers, and other sites. Nurses 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. Office, occupational health, and public health nurses are more likely to work regular business hours. More than 1 in 5 RNs worked part time in 2002 and nearly 1 in 10 held more than one job.

Nursing has its hazards, especially in hospitals, nursing care facilities, and clinics, in all three of which nurses may care for



Registered nurses work to promote health, prevent disease, and help patients to cope with illness.

individuals with infectious diseases. Nurses 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.

Employment

As the largest healthcare occupation, registered nurses held about 2.3 million jobs in 2002. Almost 3 out of 5 jobs were in hospitals, in inpatient and outpatient departments. Others worked in offices of physicians, nursing care facilities, home healthcare 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 5 RNs worked part time.

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 in order to obtain a nursing license. Nurses may be licensed in more than one State, either by examination, by the endorsement of a license issued by another State, or through a multi-State licensing agreement. 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 2002, 678 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 700 RN programs in 2002 were at the ADN level. Diploma programs, administered in hospitals, last about 3 years. Only a small and declining number of programs offer diplomas. Generally, licensed graduates of any of the three types of educational programs qualify for entry-level positions as staff nurses.

Many ADN- and diploma-educated nurses 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 one of many RN-to-BSN 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 2002, more than 110 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. Accelerated master's degree programs in nursing also are available and take about 3 years to complete.

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 bachelor's or advanced degrees. A bachelor's degree often is necessary for administrative positions and is a prerequisite for admission to graduate nursing programs in research, consulting, teaching, or a clinical specialization.

Nursing education includes classroom instruction and supervised clinical experience in hospitals and other healthcare facilities. Students take courses in anatomy, physiology, micro-

biology, chemistry, nutrition, psychology and other behavioral sciences, and nursing. Course work also includes the liberal arts.

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.

Experience and good performance can lead to promotion 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. Graduate programs preparing executive-level nurses usually last about 2 years.

Within patient care, nurses can move into a nursing specialty such as clinical nurse specialist, nurse practitioner, certified nurse midwife, or certified registered nurse anesthetist. These positions require about 2 years of graduate education leading to a master's degree.

Some nurses move into the business side of health care. Their nursing expertise and experience on a healthcare team equip them with the ability to manage ambulatory, acute, home health, and chronic care services. 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.

Job Outlook

Job opportunities for RNs are expected to be very good. Employment of registered nurses is expected to grow faster than the average for all occupations through 2012, and because the occupation is very large, many new jobs will result. In fact, more new jobs are expected to be created for RNs than for any other occupation. 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.

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 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 are reporting difficulty in attracting and retaining an adequate number of RNs, due primarily to an aging RN workforce and insufficient nursing school enrollments. Imbalances between the supply of, and demand for, qualified workers should spur efforts to attract and retain qualified RNs. For example, employers may restructure workloads, improve compensation and working conditions, and subsidize training or continuing education.

Employment in hospitals, the largest sector, is expected to grow more slowly than in most other healthcare sectors. 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 increase 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.

An increasing proportion of sophisticated procedures, which once were performed only in hospitals, are being performed in physicians' offices and in outpatient care centers, such as free-standing ambulatory surgical and emergency centers. Accordingly, employment is expected to grow faster than average in these places as healthcare in general expands.

Employment in nursing care facilities is expected to grow faster than average due to 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 healthcare 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.

In evolving integrated healthcare networks, nurses may rotate among various employment settings. Because jobs in traditional hospital nursing positions are no longer the only option, RNs will need to be flexible. Opportunities should be excellent, particularly for nurses with advanced education and training.

Earnings

Median annual earnings of registered nurses were \$48,090 in 2002. The middle 50 percent earned between \$40,140 and \$57,490. The lowest 10 percent earned less than \$33,970, and the highest 10 percent earned more than \$69,670. Median annual earnings in the industries employing the largest numbers of registered nurses in 2002 were as follows:

Employment services	\$55,980
General medical and surgical hospitals	49,190
Home health care services	45,890
Offices of physicians	44,870
Nursing care facilities	43,850

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

Related Occupations

Workers in other healthcare occupations with responsibilities and duties related to those of registered nurses are emergency medical technicians and paramedics, occupational therapists, physical therapists, physician assistants, respiratory therapists, and social workers.

Sources of Additional Information

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

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

For a list 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>

Information on registered nurses also is available from:

► American Nurses Association, 600 Maryland Ave. SW., Washington, DC 20024-2571. Internet: <http://www.nursingworld.org>

Respiratory Therapists

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

Significant Points

- An associate degree has become the general requirement for entry into this field.
- Hospitals will continue to employ the vast majority of respiratory therapists, but a growing number of therapists will work in other settings.
- Job opportunities will be very good, especially for therapists with cardiopulmonary care skills or experience working with newborns and infants.

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. Respiratory therapists, practicing under physician direction, 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, although therapists generally have greater responsibility than technicians. For example, respiratory therapists will primarily consult with physicians and other healthcare staff to help develop and modify individual patient care plans. Respiratory therapists are also more likely to provide complex therapy requiring considerable independent judgment, such as caring for patients on life support in hospital intensive care units. In this statement, the term *respiratory therapists* includes both respiratory therapists and respiratory therapy technicians.

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 level 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. Physicians rely on data provided by respiratory therapists to make treatment decisions.

Respiratory therapists 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 treat patients, respiratory therapists use oxygen or oxygen mixtures, chest physiotherapy, and aerosol medications. When a patient has difficulty getting enough oxygen into their

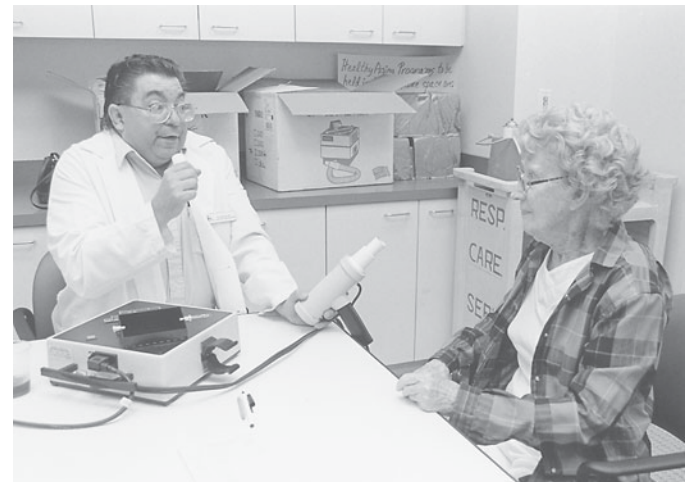
blood, therapists increase the patient's concentration of oxygen by placing an oxygen mask or nasal cannula on a patient and set the oxygen flow at the level prescribed by a physician. Therapists also connect patients who cannot breathe on their own to ventilators that deliver pressurized oxygen into the lungs. The therapists insert a tube into the patient's trachea, or windpipe; connect the tube to the ventilator; and set the rate, volume, and oxygen concentration of the oxygen mixture entering the patient's lungs.

Therapists perform regular checks on patients and equipment. If the patient appears to be having difficulty, 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 they thump and 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 cardiopulmonary procedures such as taking electrocardiograms and administering stress tests, as well as other areas—for example, drawing blood samples from patients. Therapists also keep records of materials used and charges to patients.



To evaluate patients, respiratory therapists test the capacity of the lungs and analyze their oxygen and carbon dioxide concentrations.

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 healthcare must travel frequently to the homes of patients.

Respiratory therapists are trained to work with gases stored under pressure that can be hazardous. 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 a risk of catching an infectious disease, but carefully following proper procedures minimizes this risk.

Employment

Respiratory therapists held about 112,000 jobs in 2002. More than 4 out of 5 jobs were in hospital departments of respiratory care, anesthesiology, or pulmonary medicine. Most of the remaining jobs were found in offices of physicians or other health practitioners, consumer goods rental firms that supply respiratory equipment for home use, nursing care facilities, and home healthcare services. Holding a second job is relatively common for respiratory therapists. About 17 percent held another job, compared with 5 percent of workers in all occupations.

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 degree has become the general requirement for entry into this field. Most programs award associate or bachelor's degrees and prepare graduates for jobs as advanced respiratory therapists. Other programs award associate degrees or certificates and lead to jobs as entry-level respiratory therapists. According to the Commission on Accreditation of Allied Health Education Programs (CAAHEP), 59 entry-level and 319 advanced respiratory therapy programs are presently accredited in the United States, including Puerto Rico.

Areas of study in respiratory therapy programs include 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, 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.

More than 40 States license respiratory care personnel. Aspiring respiratory care practitioners should check on licensure requirements with the board of respiratory care examiners for the State in which they plan to work. Also, most employers require respiratory therapists to maintain a cardiopulmonary resuscitation (CPR) certification.

The National Board for Respiratory Care (NBRC) offers voluntary 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 programs in respiratory therapy may take the CRT examination. CRTs who meet

education and experience requirements can take two separate examinations leading to the award of the RRT credential. The CRT examination is the standard in the States requiring licensure.

Most employers require applicants for entry-level or generalist positions to hold the CRT or at least be eligible to take the certification examination. Supervisory positions and intensive-care specialties usually require the RRT or 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 care of critical patients who have significant problems in other organ systems, such as the heart or kidneys. Respiratory therapists, especially those with 4-year degrees, may also advance to supervisory or managerial positions in a respiratory therapy department. Respiratory therapists in home healthcare and equipment rental firms may become branch managers. Some respiratory therapists advance by moving into teaching positions.

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 2012, because of substantial growth in numbers of the middle-aged and elderly population—a development that will heighten the incidence of cardiopulmonary disease.

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 treating victims of heart attacks, 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 healthcare services, offices of physicians or other health practitioners, or consumer goods rental firms.

Earnings

Median annual earnings of respiratory therapists were \$40,220 in 2002. The middle 50 percent earned between \$34,430 and \$46,130. The lowest 10 percent earned less than \$30,270, and the highest 10 percent earned more than \$54,030. In general medical and surgical hospitals, median annual earnings of respiratory therapists were \$40,390 in 2002.

Median annual earnings of respiratory therapy technicians were \$34,130 in 2002. The middle 50 percent earned between \$28,460 and \$41,140. The lowest 10 percent earned less than

\$23,230, and the highest 10 percent earned more than \$47,800. Median annual earnings of respiratory therapy technicians employed in general medical and surgical hospitals were \$34,210 in 2002.

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>

For a list of accredited educational programs for respiratory care practitioners, contact:

► Commission on Accreditation for Allied Health Education Programs, 39 East Wacker Dr., Chicago, IL 60601. Internet: <http://www.caahep.org>

► Committee on Accreditation for Respiratory Care, 1248 Harwood Rd., Bedford, TX 76021-4244.

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

► National Board for Respiratory Care, Inc., 8310 Nieman Rd., Lenexa, KS 66214-1579. Internet: <http://www.nbrc.org>

Speech-Language Pathologists

(0*NET 29-1127.00)

Significant Points

- Employment of speech-language pathologists is expected to grow rapidly because the expanding population in older age groups is prone to medical conditions that result in speech, language, and swallowing problems.
- About half worked in educational services, and most others were employed by healthcare and social assistance facilities.
- A master's degree in speech-language pathology is the standard credential.

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 make speech sounds, or cannot make them clearly; those with speech rhythm and fluency problems, such as stuttering; people with voice quality problems, 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; those with cognitive communication impairments, such as attention, memory, and problem solving disorders; and those with hearing loss who use hearing aids or cochlear implants in order to develop auditory skills and improve communication. They also work with people who have swallowing difficulties.

Speech and language difficulties can result from a variety of causes including stroke, brain injury or deterioration, developmental delays, cerebral palsy, cleft palate, voice pathology, mental retardation, hearing impairment, or emotional problems. Problems can be congenital, developmental, or acquired. Speech-language pathologists use written and oral tests, as well as special instruments, to diagnose the nature and extent of impairment and to record and analyze speech, language, and swallowing irregularities. 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 language skills to communicate more effectively. Speech-language pathologists help patients develop, or recover, reliable communication skills so patients can fulfill their educational, vocational, and social roles.

Most speech-language pathologists provide direct clinical services to individuals with communication or swallowing disorders. In speech and language clinics, they may independently develop and carry out treatment programs. In medical facilities, they may work with physicians, social workers, psychologists, and other therapists. Speech-language pathologists in schools develop individual or group programs, counsel parents, and may assist teachers with classroom activities.

Speech-language pathologists keep records on the initial evaluation, progress, and discharge of clients. This helps pinpoint problems, tracks client progress, and justifies the cost of treatment when applying for reimbursement. They counsel individuals and their families concerning communication disorders and how to cope with the stress and misunderstanding that often accompany them. They also work with family members to recognize and change behavior patterns that impede communication and treatment and show them communication-enhancing techniques to use at home.

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

Working Conditions

Speech-language pathologists usually work at a desk or table in clean comfortable surroundings. In medical settings, they may work at the patient's bedside and assist in positioning the patient. In school settings they may participate in classroom activities. While the job is not physically demanding, it requires attention to detail and intense concentration. The emotional needs of clients and their families may be demanding. Most full-time speech-language pathologists work between 35 and 40 hours per week; some work part time. Those who work on a contract basis may spend a substantial amount of time traveling between facilities.

Employment

Speech-language pathologists held about 94,000 jobs in 2002. About half of jobs were in educational services, including pre-schools, elementary and secondary schools, and colleges and universities. Others were in hospitals; offices of other health practitioners, including speech-language pathologists; nursing care facilities; home healthcare services; individual and family services; outpatient care centers; child day care services; or other facilities.

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.



Most speech-language pathologists provide direct clinical services to individuals with communication or swallowing disorders.

Training, Other Qualifications, and Advancement

Of the 46 States that regulate licensing, almost all require a master's degree or equivalent. A passing score on a national examination on speech-language pathology offered through the Praxis Series of the Educational Testing Service is needed, as well. Other requirements are 300 to 375 hours of supervised clinical experience and 9 months of postgraduate professional clinical experience. Thirty-eight 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.

About 233 colleges and universities offer graduate programs in speech-language pathology. Courses cover anatomy and physiology of the areas of the body involved in speech, language, swallowing, and hearing; the development of normal speech, language, swallowing, and hearing; the nature of disorders; acoustics; and psychological aspects of communication. Graduate students also learn to evaluate and treat speech, language, swallowing, and hearing 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 375 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 clients. They must be able to approach problems objectively and provide support to clients and their families. Because a client's progress may be slow, patience, compassion, and good listening skills are necessary.

Job Outlook

Employment of speech-language pathologists is expected to grow faster than the average for all occupations through the year 2012. Members of the baby boom generation are now entering middle age, when the possibility of neurological disorders and associated speech, language, swallowing, and hearing 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. Many States now require that all newborns be screened for hearing loss and receive appropriate early intervention services.

In health services facilities, the impact of proposed Federal legislation imposing limits on reimbursement for therapy services may adversely affect the short-term job outlook for therapy providers. 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, language, swallowing, and hearing 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. In addition to job openings stemming from employment growth, a number of openings for speech-language pathologists will arise from the need to replace those who leave the occupation.

Earnings

Median annual earnings of speech-language pathologists were \$49,450 in 2002. The middle 50 percent earned between \$39,930 and \$60,190. The lowest 10 percent earned less than \$32,580, and the highest 10 percent earned more than \$74,010. Median annual earnings in the industries employing the largest numbers of speech-language pathologists in 2002 were as follows:

Offices of other health practitioners	\$53,090
General medical and surgical hospitals	52,940
Elementary and secondary schools	46,060

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. For those who worked on an academic-year basis, usually 9 or 10 months annually, the median annual salary was \$44,800. 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 experience were \$42,000 for those who worked on a calendar-year basis and \$37,000 for those who worked on an academic-year basis.

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, recreational therapists, and rehabilitation counselors.

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 speech-language pathology is available from:

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

Veterinarians

(0*NET 29-1131.00)

Significant Points

- Graduation from an accredited college of veterinary medicine and a State license are required.
- Employment opportunities are expected to be very good, but competition for admission to veterinary school is keen.
- Veterinarians should have an affinity for animals and the ability to get along with animal owners.

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 one-half 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 nondomestic 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, focusing mostly on 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 food animals. These veterinarians test for and vaccinate against diseases and consult with farm or ranch owners and managers on animal production, feeding, and housing issues. They also treat and dress wounds, set fractures, and perform surgery—including cesarean sections on birthing animals. Veterinarians also 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, such as 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 treatment, 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; and solo practitioners can 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 also 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, veteri-



Most veterinarians perform clinical work in private practices on animals such as cats and dogs.

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

Employment

Veterinarians held about 58,000 jobs in 2002. About 28 percent were self-employed in solo or group practices. Most others were salaried employees of another veterinary practice. The Federal Government employed about 1,100 civilian veterinarians, chiefly in the U.S. Departments of Agriculture and Health and Human Services. 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 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*.)

Training, Other Qualifications, and Advancement

Prospective veterinarians must graduate from a 4-year program at an accredited college of veterinary medicine with a Doctor of Veterinary Medicine (D.V.M. or V.M.D.) degree and 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 by veterinary medical college. 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.

Preveterinary 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 also 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 each college. Currently, 21 schools require the GRE, 5 require the VCAT, and 2 accept the MCAT.

Some veterinary medical colleges place heavy consideration on a candidate's veterinary and animal experience in admittance decisions. 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 largely re-

mained the same since 1983, whereas the number of applicants has risen significantly. Only about 1 in 3 applicants was accepted in 2002. Most veterinary medical colleges are public, State-supported institutions and reserve the majority of their openings for in-state residents, making admission for out-of-state applicants difficult.

While in veterinary medical college, students receive additional academic instruction in the basic sciences for the first 2 years. Later in the program, students are exposed to clinical procedures, such as diagnosing and treating animal diseases and performing surgery. They also do laboratory work in anatomy, biochemistry, medicine, and other scientific subjects. At most veterinary medical colleges, students who plan a career in research can earn both a D.V.M. degree and a Doctor of Philosophy (Ph.D.) degree at the same time.

Veterinary graduates who plan to work with specific types of animals typically choose to pursue additional education in 1 of 20 AVMA-recognized veterinary specialties—such as pathology, internal medicine, dentistry, ophthalmology, surgery, radiology, preventive medicine, or laboratory animal medicine—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 must also 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 successful completion of the D.V.M. degree—or equivalent education—and passage of 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 clinical proficiency. ECFVG certification fulfills the educational requirement for licensure in all States except Nebraska. Applicants for licensure satisfy the examination requirement by passing the North American Veterinary Licensing Exam (NAVLE). The NAVLE, administered by computer, takes 1 day to complete and consists of 360 multiple-choice questions, covering all aspects of veterinary medicine. The NAVLE also includes visual materials designed to test diagnostic skills, comprising 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 also do additional testing on clinical competency. There are few reciprocal agreements between States, making it difficult for a veterinarian to practice in a different State without first taking another State 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 animal owners, especially when working with 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 successfully manage their practice and employees and will need to promote, market, and sell their services.

Job Outlook

Very good opportunities are expected because the number of graduates from veterinary school is not expected to increase significantly over the 2002-12 period. However, as mentioned earlier, there is keen competition for admittance to veterinary school. Employment of veterinarians is expected to increase faster than the average for all occupations through the year 2012. As pets are increasingly viewed as a member of the family, pet owners will be more willing to spend increasing amounts on advanced veterinary medical care, creating more 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 small-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 small-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 public health and epidemiology should have the best opportunities for a career in the Federal Government.

Earnings

Median annual earnings of veterinarians were \$63,090 in 2002. The middle 50 percent earned between \$49,050 and \$85,770. The lowest 10 percent earned less than \$38,000, and the highest 10 percent earned more than \$123,370.

According to a survey by the American Veterinary Medical Association, average starting salaries of 2002 veterinary medical college graduates varied by type of practice as follows:

All private clinical practices	\$46,339
Large animals, exclusively	48,303
Small animals, exclusively	48,178
Small animals, predominantly	46,582
Large animals, predominantly	45,087
Mixed animals	43,948
Equine (horses)	34,273

The average annual salary for veterinarians in the Federal Government in nonsupervisory, supervisory, and managerial positions was \$72,208 in 2003.

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, closely paralleling 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:

► Association of American Veterinary Medical Colleges, 1101 Vermont Ave. NW., Suite 710, Washington, DC 20005. Internet: <http://www.aavmc.org>

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

Information on obtaining a veterinarian position with the Federal Government is available from the U.S. Office of Personnel Management (OPM) through a telephone-based system. Consult your telephone directory under U.S. Government for a local number or call (703) 724-1850; Federal Relay Service: (800) 877-8339. The first number is not tollfree, and charges may result. Information also is available from the OPM Internet site: <http://www.usajobs.opm.gov>.