

# Fastest Growing Careers in California That Require Less Than a 4 Year Degree: Career Details

(Presented in Alphabetical Order)

## Cement Masons, Concrete Finishers, Segmental Pavers, and Terrazzo Workers

### Significant Points

- Job opportunities are expected to be favorable.
- Most learn on the job, either through formal 3-year or 4-year apprenticeship programs or by working as helpers. Like many other construction trades, these workers may experience reduced earnings and layoffs during downturns in construction activity. Cement masons often work overtime, with premium pay, because once concrete has been placed, the job must be completed.

### Nature of the Work

Cement masons, concrete finishers, and terrazzo workers all work with concrete, one of the most common and durable materials used in construction. Once set, concrete—a mixture of Portland cement, sand, gravel, and water—becomes the foundation for everything from decorative patios and floors to huge dams or miles of roadways.

*Cement masons* and *concrete finishers* place and finish the concrete. They also may color concrete surfaces; expose aggregate (small stones) in walls and sidewalks; or fabricate concrete beams, columns, and panels. In preparing a site for placing concrete, cement masons first set the forms for holding the concrete and properly align them. They then direct the casting of the concrete and supervise laborers who use shovels or special tools to spread it. Masons then guide a straightedge back and forth across the top of the forms to “screed,” or level, the freshly placed concrete. Immediately after leveling the concrete, masons carefully smooth the concrete surface with a “bull float,” a long-handled tool about 8 by 48 inches that covers the coarser materials in the concrete and brings a rich mixture of fine cement paste to the surface.

After the concrete has been leveled and floated, concrete finishers press an edger between the forms and the concrete and guide it along the edge and the surface. This produces slightly rounded edges and helps prevent chipping or cracking. Concrete finishers use a special tool called a “groover” to make joints or grooves at specific intervals that help control cracking. Next, they trowel the surface using either a powered or hand trowel, a small, smooth, rectangular metal tool.

Sometimes, cement masons perform all the steps of laying concrete, including the finishing. As the final step, they retrowel the concrete surface back and forth with powered and hand trowels to create a smooth finish. For a coarse, nonskid finish, masons brush the surface with a broom or stiff-bristled brush. For a pebble finish, they embed small gravel chips into the surface. They then wash any excess cement from the exposed chips with a mild acid solution. For color, they use colored premixed concrete. On concrete surfaces that will remain exposed after the forms are stripped, such as columns, ceilings, and wall panels, cement masons cut away high spots and loose concrete with hammer and chisel, fill any large indentations with a Portland cement paste, and smooth the surface with a carborundum stone. Finally, they coat the exposed area with a rich Portland cement mixture, using either a special tool or a coarse cloth to rub the concrete to a uniform finish.

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Throughout the entire process, cement masons must monitor how the wind, heat, or cold affects the curing of the concrete. They must have a thorough knowledge of concrete characteristics so that, by using sight and touch, they can determine what is happening to the concrete and take measures to prevent defects.

*Segmental pavers* lay out, cut, and install pavers, which are flat pieces of masonry usually made from compacted concrete or brick. Pavers are used to pave paths, patios, playgrounds, driveways, and steps. They are manufactured in various textures and often interlock together to form an attractive pattern. Segmental pavers first prepare the site by removing the existing pavement or soil. They grade the remaining soil to the proper depth and determine the amount of base material that is needed, which depends on the local soil conditions. They then install and compact the base material, a granular material that compacts easily, and lay the pavers from the center out, so that any trimmed pieces will be on the outside rather than in the center. Then, they install edging materials to prevent the pavers from shifting and fill the spaces between the pavers with dry sand.

*Terrazzo workers* create attractive walkways, floors, patios, and panels by exposing marble chips and other fine aggregates on the surface of finished concrete. Much of the preliminary work of terrazzo workers is similar to that of cement masons. Attractive, marble-chip terrazzo requires three layers of materials. First, cement masons or terrazzo workers build a solid, level concrete foundation that is 3 to 4 inches deep. After the forms are removed from the foundation, workers add a 1-inch layer of sandy concrete. Before this layer sets, terrazzo workers partially embed metal divider strips in the concrete wherever there is to be a joint or change of color in the terrazzo. For the final layer, terrazzo workers blend and place into each of the panels a fine marble chip mixture that may be color-pigmented. While the mixture is still wet, workers toss additional marble chips of various colors into each panel and roll a lightweight roller over the entire surface.

When the terrazzo is thoroughly dry, helpers grind it with a terrazzo grinder, which is somewhat like a floor polisher, only much heavier. Slight depressions left by the grinding are filled with a matching grout material and hand-troweled for a smooth, uniform surface. Terrazzo workers then clean, polish, and seal the dry surface for a lustrous finish.

## Working Conditions

Concrete, segmental paving, or terrazzo work is fast-paced and strenuous, and requires continuous physical effort. Because most finishing is done at floor level, workers must bend and kneel often. Many jobs are outdoors, and work is generally halted during inclement weather. The work, either indoors or outdoors, may be in areas that are muddy, dusty, or dirty. To avoid chemical burns from uncured concrete and sore knees from frequent kneeling, many workers wear kneepads. Workers usually also wear water-repellent boots while working in wet concrete.

## Employment

Cement masons, concrete finishers, segmental pavers, and terrazzo workers held about 190,000 jobs in 2002; segmental pavers and terrazzo workers accounted for only a small portion of the total. Most cement masons and concrete finishers worked for concrete contractors or for general contractors on projects such as highways; bridges; shopping malls; or large buildings such as factories, schools, and hospitals. A small number were employed by firms that manufacture

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concrete products. Most segmental pavers and terrazzo workers worked for special trade contractors who install decorative floors and wall panels.

Only about 1 out of 20 cement masons, concrete finishers, segmental pavers, and terrazzo workers were self-employed, a smaller proportion than in other building trades. Most self-employed masons specialized in small jobs, such as driveways, sidewalks, and patios.

## Training, Other Qualifications, and Advancement

Most cement masons, concrete finishers, segmental pavers, and terrazzo workers learn their trades either through on-the-job training as helpers, or through 3-year or 4-year apprenticeship programs. Many masons and finishers first gain experience as construction laborers. (See the statement on construction laborers elsewhere in the *Handbook*.)

When hiring helpers and apprentices, employers prefer high school graduates who are at least 18 years old and in good physical condition, and who have a driver's license. The ability to get along with others also is important because cement masons frequently work in teams. High school courses in general science, vocational-technical subjects, mathematics, blueprint reading, or mechanical drawing provide a helpful background.

On-the-job training programs consist of informal instruction, in which experienced workers teach helpers to use the tools, equipment, machines, and materials of the trade. Trainees begin with tasks such as edging, jointing, and using a straightedge on freshly placed concrete. As training progresses, assignments become more complex, and trainees can usually do finishing work within a short time.

Three-year or four-year apprenticeship programs, usually jointly sponsored by local unions and contractors, provide on-the-job training in addition to a recommended minimum of 144 hours of classroom instruction each year. A written test and a physical exam may be required. In the classroom, apprentices learn applied mathematics, blueprint reading, and safety. Apprentices generally receive special instruction in layout work and cost estimation. Some workers learn their jobs by attending trade or vocational-technical schools.

Cement masons, concrete finishers, segmental pavers, and terrazzo workers should enjoy doing demanding work. They should take pride in craftsmanship and be able to work without close supervision.

With additional training, cement masons, concrete finishers, segmental pavers, or terrazzo workers may become supervisors for masonry contractors. Some eventually become owners of businesses employing many workers and may spend most of their time as managers rather than practicing their original trade. Others move into closely related areas such as construction management, building inspection, or contract estimation.

## Job Outlook

Opportunities for cement masons, concrete finishers, segmental pavers, and terrazzo workers are expected to be favorable as the demand meets the supply of workers trained in this craft. In addition, many potential workers may prefer work that is less strenuous and has more comfortable working conditions.

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Employment of cement masons, concrete finishers, segmental pavers, and terrazzo workers is expected to grow faster than the average for all occupations through 2012. These workers will be needed to build highways, bridges, subways, factories, office buildings, hotels, shopping centers, schools, hospitals, and other structures. In addition, the increasing use of concrete as a building material will add to the demand. More cement masons also will be needed to repair and renovate existing highways, bridges, and other structures. In addition to job growth, other openings will become available as experienced workers transfer to other occupations or leave the labor force.

Employment of cement masons, concrete finishers, segmental pavers, and terrazzo workers, like that of many other construction workers, is sensitive to the fluctuations of the economy. Workers in these trades may experience periods of unemployment when the overall level of construction falls. On the other hand, shortages of these workers may occur in some areas during peak periods of building activity.

## Earnings

In 2002, the median hourly earnings of cement masons and concrete finishers were \$14.74. The middle 50 percent earned between \$11.52 and \$20.02. The top 10 percent earned over \$26.02, and the bottom 10 percent earned less than \$9.31.

In 2002, the median hourly earnings of terrazzo workers and finishers were \$13.42. The middle 50 percent earned between \$10.46 and \$17.72. The top 10 percent earned over \$23.70, and the bottom 10 percent earned less than \$8.94.

Like those of other construction trades workers, earnings of cement masons, concrete finishers, segmental pavers, and terrazzo workers may be reduced on occasion because poor weather and downturns in construction activity limit the amount of time they can work. Cement masons often work overtime, with premium pay, because once concrete has been placed, the job must be completed.

Many cement masons, concrete finishers, segmental pavers, and terrazzo workers belong to the Operative Plasterers' and Cement Masons' International Association of the United States and Canada, or to the International Union of Bricklayers and Allied Craftworkers. Some terrazzo workers belong to the United Brotherhood of Carpenters and Joiners of the United States. Nonunion workers generally have lower wage rates than do union workers. Apprentices usually start at 50 to 60 percent of the rate paid to experienced workers.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Cement Masons, Concrete Finishers, Segmental Pavers, and Terrazzo Workers, on the Internet at <http://www.bls.gov/oco/ocos204.htm>.

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## Computer Support Specialists and Systems Administrators

### Significant Points

- Computer support specialists and systems administrators are projected to be among the fastest growing occupations over the 2002-12 period.
- There are many paths of entry to these occupations.
- Job prospects should be best for college graduates who are up to date with the latest skills and technologies; certifications and practical experience are essential for persons without degrees.

### Nature of the Work

In the last decade, computers have become an integral part of everyday life, used for a variety of reasons at home, in the workplace, and at schools. And almost every computer user encounters a problem occasionally, whether it is the disaster of a crashing hard drive or the annoyance of a forgotten password. The explosion of computer use has created a high demand for specialists to provide advice to users, as well as day-to-day administration, maintenance, and support of computer systems and networks.

*Computer support specialists* provide technical assistance, support, and advice to customers and other users. This occupational group includes *technical support specialists* and *help-desk technicians*. These troubleshooters interpret problems and provide technical support for hardware, software, and systems. They answer telephone calls, analyze problems using automated diagnostic programs, and resolve recurrent difficulties. Support specialists may work either within a company that uses computer systems or directly for a computer hardware or software vendor. Increasingly, these specialists work for help-desk or support services firms, where they provide computer support to clients on a contract basis.

Technical support specialists are troubleshooters, providing valuable assistance to their organization's computer users. Because many nontechnical employees are not computer experts, they often run into computer problems that they cannot resolve on their own. Technical support specialists install, modify, clean, and repair computer hardware and software. They also may work on monitors, keyboards, printers, and mice.

Technical support specialists answer telephone calls from their organizations' computer users and may run automatic diagnostics programs to resolve problems. They also may write training manuals and train computer users how to properly use new computer hardware and software. In addition, technical support specialists oversee the daily performance of their company's computer systems and evaluate software programs for usefulness.

Help-desk technicians assist computer users with the inevitable hardware and software questions not addressed in a product's instruction manual. Help-desk technicians field telephone calls and e-mail messages from customers seeking guidance on technical problems. In responding to these requests for guidance, help-desk technicians must listen carefully to the customer, ask questions to diagnose the nature of the problem, and then patiently walk the customer through the problem-solving steps.

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Help-desk technicians deal directly with customer issues, and companies value them as a source of feedback on their products. These technicians are consulted for information about what gives customers the most trouble, as well as other customer concerns. Most computer support specialists start out at the help desk.

*Network or computer systems administrators* design, install, and support an organization's LAN (local-area network), WAN (wide-area network), network segment, Internet, or intranet system. They provide day-to-day onsite administrative support for software users in a variety of work environments, including professional offices, small businesses, government, and large corporations. They maintain network hardware and software, analyze problems, and monitor the network to ensure its availability to system users. These workers gather data to identify customer needs and then use that information to identify, interpret, and evaluate system and network requirements. Administrators also may plan, coordinate, and implement network security measures.

Systems administrators are the information technology employees responsible for the efficient use of networks by organizations. They ensure that the design of an organization's computer site allows all of the components, including computers, the network, and software, to fit together and work properly. Furthermore, they monitor and adjust performance of existing networks and continually survey the current computer site to determine future network needs. Administrators also troubleshoot problems as reported by users and automated network monitoring systems and make recommendations for enhancements in the implementation of future servers and networks.

In some organizations, *computer security specialists* may plan, coordinate, and implement the organization's information security. These workers may be called upon to educate users on computer security, install security software, monitor the network for security breaches, respond to cyber attacks, and in some cases, gather data and evidence to be used in prosecuting cyber crime. This and other growing specialty occupations reflect the increasing emphasis on client-server applications, the expansion of Internet and intranet applications, and the demand for more end-user support.

## Working Conditions

Computer support specialists and systems administrators normally work in well-lit, comfortable offices or computer laboratories. They usually work about 40 hours a week, but that may include being "on call" via pager or telephone for rotating evening or weekend work if the employer requires computer support over extended hours. Overtime may be necessary when unexpected technical problems arise. Like other workers who type on a keyboard for long periods, computer support specialists and systems administrators are susceptible to eyestrain, back discomfort, and hand and wrist problems such as carpal tunnel syndrome.

Due to the heavy emphasis on helping all types of computer users, computer support specialists and systems administrators constantly interact with customers and fellow employees as they answer questions and give valuable advice. Those who work as consultants are away from their offices much of the time, sometimes spending months working in a client's office.

As computer networks expand, more computer support specialists and systems administrators may be able to connect to a customer's computer remotely, using modems, laptops, e-mail, and the Internet, to provide technical support to computer users. This capability would reduce or eliminate travel to the customer's workplace. Systems administrators also can administer and

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configure networks and servers remotely, although this practice is not as common as it is with computer support specialists.

## Employment

Computer support specialists and systems administrators held about 758,000 jobs in 2002. Of these, about 507,000 were computer support specialists and about 251,000 were network and computer systems administrators. Although they worked in a wide range of industries, 35 percent of all computer support specialists and systems administrators were employed in professional and business services industries, principally in computer systems design and related services. Other organizations that employed substantial numbers of these workers include banks, government agencies, insurance companies, educational institutions, and wholesale and retail vendors of computers, office equipment, appliances, and home electronic equipment. Many computer support specialists also worked for manufacturers of computers, semiconductors, and other electronic components.

Employers of computer support specialists and systems administrators range from startup companies to established industry leaders. With the continued development of the Internet, telecommunications, and e-mail, industries not typically associated with computers—such as construction—increasingly need computer-related workers. Small and large firms across all industries are expanding or developing computer systems, creating an immediate need for computer support specialists and systems administrators.

## Training, Other Qualifications, and Advancement

Due to the wide range of skills required, there are many paths of entry to a job as a computer support specialist or systems administrator. While there is no universally accepted way to prepare for a job as a computer support specialist, many employers prefer to hire persons with some formal college education. A bachelor's degree in computer science or information systems is a prerequisite for some jobs; however, other jobs may require only a computer-related associate degree. For systems administrators, many employers seek applicants with bachelor's degrees, although not necessarily in a computer-related field.

Many companies are becoming more flexible about requiring a college degree for support positions because of the explosive demand for specialists. However, certification and practical experience demonstrating these skills will be essential for applicants without a degree. Completion of a certification training program, offered by a variety of vendors and product makers, may help some people to qualify for entry-level positions. Relevant computer experience may substitute for formal education.

Beginning computer support specialists usually work for organizations that deal directly with customers or in-house users. Then, they may advance into more responsible positions in which they use what they have learned from customers to improve the design and efficiency of future products. Job promotions usually depend more on performance than on formal education. Eventually, some computer support specialists become applications developers, designing products rather than assisting users. Computer support specialists at hardware and software companies often enjoy great upward mobility; advancement sometimes comes within months of initial employment.

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Entry-level network and computer systems administrators are involved in routine maintenance and monitoring of computer systems, typically working behind the scenes in an organization. After gaining experience and expertise, they often are able to advance into more senior-level positions, in which they take on more responsibilities. For example, senior network and computer systems administrators may present recommendations to management on matters related to a company's network. They also may translate the needs of an organization into a set of technical requirements, based on the available technology. As with support specialists, administrators may become software engineers, actually involved in the designing of the system or network and not just the day-to-day administration.

Persons interested in becoming a computer support specialist or systems administrator must have strong problem-solving, analytical, and communication skills because troubleshooting and helping others are vital parts of the job. The constant interaction with other computer personnel, customers, and employees requires computer support specialists and systems administrators to communicate effectively on paper, via e-mail, or in person. Strong writing skills are useful when preparing manuals for employees and customers.

As technology continues to improve, computer support specialists and systems administrators must keep their skills current and acquire new ones. Many continuing education programs are offered by employers, hardware and software vendors, colleges and universities, and private training institutions. Professional development seminars offered by computing services firms also can enhance one's skills and advancement opportunities.

## Job Outlook

Employment of computer support specialist is expected to increase faster than the average for all occupations through 2012, as organizations continue to adopt and integrate increasingly sophisticated technology. Job growth will continue to be driven by the continued expansion of the computer system design and related services industry, which is projected to remain one of the fastest growing industries in the U.S. economy, despite recent job losses. Job growth will not be as explosive as growth during the previous decade as these jobs are being increasingly outsourced overseas.

Employment growth among computer support specialists reflects the rapid pace of improved technology. As computers and software become more complex, support specialists will be needed to provide technical assistance to customers and other users. New mobility technologies, such as the wireless Internet, will continue to create a demand for these workers to familiarize and educate computer users. Consulting opportunities for computer support specialists also should continue to grow as businesses increasingly need help managing, upgrading, and customizing more complex computer systems. However, growth in employment of support specialists may be tempered somewhat as firms continue to cut costs by shifting more routine work abroad to countries where workers are highly skilled but labor costs are lower. Physical location is not as important for these workers as it is for others, because computer support specialists can provide assistance remotely and support services can be provided around the clock.

Employment of systems administrators is expected to increase much faster than average as firms will continue to invest heavily in securing computer networks. Companies are looking for workers knowledgeable about the function and administration of networks. Such employees have become increasingly hard to find as systems administration has moved from being a separate function within corporations to one that forms a crucial element of business in an increasingly high-

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technology economy. Also, demand for computer security specialists will grow as businesses and government continue to invest heavily in “cyber-security,” protecting vital computer networks and electronic infrastructure from attack.

The growth of electronic commerce means that more establishments use the Internet to conduct their business online. This translates into a need for information technology specialists who can help organizations use technology to communicate with employees, clients, and consumers. Explosive growth in these areas also is expected to fuel demand for specialists knowledgeable about network, data, and communications security.

Job prospects should be best for college graduates who are up to date with the latest skills and technologies, particularly if they have supplemented their formal education with some relevant work experience. Employers will continue to seek computer specialists who possess a strong background in fundamental computer skills, combined with good interpersonal and communication skills. Due to the rapid growth in demand for computer support specialists and systems administrators, those who have strong computer skills but do not have a bachelor’s degree should continue to qualify for some entry-level positions. However, certifications and practical experience are essential for persons without degrees.

## Earnings

Median annual earnings of computer support specialists were \$39,100 in 2002. The middle 50 percent earned between \$29,760 and \$51,680. The lowest 10 percent earned less than \$23,060, and the highest 10 percent earned more than \$67,550. Median annual earnings in the industries employing the largest numbers of computer support specialists in 2002 were:

Professional and commercial equipment and supplies merchant wholesalers	\$46,740
Software publishers	42,870
Computer systems design and related services	41,110
Management of companies and enterprises	40,850
Elementary and secondary schools	33,480

Median annual earnings of network and computer systems administrators were \$54,810 in 2002. The middle 50 percent earned between \$43,290 and \$69,530. The lowest 10 percent earned less than \$34,460, and the highest 10 percent earned more than \$86,440. Median annual earnings in the industries employing the largest numbers of network and computer systems administrators in 2002 were:

Wired telecommunications carriers	\$59,710
Computer systems design and related services	58,790
Management of companies and enterprises	58,610
Data processing, hosting, and related services	56,140
Elementary and secondary schools	48,350

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According to Robert Half International, starting salaries in 2003 ranged from \$27,500 to \$56,500 for help-desk support staff, and from \$51,000 to \$67,250 for more senior technical support specialists. For systems administrators, starting salaries in 2003 ranged from \$49,000 to \$70,250.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Computer Support Specialists and Systems Administrators, on the Internet at <http://www.bls.gov/oco/ocos268.htm>.

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## Correctional Officers

### Significant Points

- The work can be stressful and hazardous.
- Most correctional officers work in institutions located in rural areas with smaller inmate populations than those in urban jails.
- Job opportunities are expected to be excellent.

### Nature of the Work

Correctional officers are responsible for overseeing individuals who have been arrested and are awaiting trial or who have been convicted of a crime and sentenced to serve time in a jail, reformatory, or penitentiary. They maintain security and inmate accountability to prevent disturbances, assaults, or escapes. Officers have no law enforcement responsibilities outside the institution where they work. (For more information on related occupations, see the statements on police and detectives, and probation officers and correctional treatment specialists, elsewhere in the *Handbook*.)

Police and sheriffs' departments in county and municipal jails or precinct station houses employ many correctional officers, also known as *detention officers*. Most of the approximately 3,300 jails in the United States are operated by county governments, with about three-quarters of all jails under the jurisdiction of an elected sheriff. Individuals in the jail population change constantly as some are released, some are convicted and transferred to prison, and new offenders are arrested and enter the system. Correctional officers in the U.S. jail system admit and process more than 11 million people a year, with about half a million offenders in jail at any given time. When individuals are first arrested, the jail staff may not know their true identity or criminal record, and violent detainees may be placed in the general population. This is the most dangerous phase of the incarceration process for correctional officers.

Most correctional officers are employed in large jails or State and Federal prisons, watching over the approximately one million offenders who are incarcerated at any given time. In addition to jails and prisons, a relatively small number of correctional officers oversee individuals being held by the U.S. Immigration and Naturalization Service before they are released or deported, or they work for correctional institutions that are run by private for-profit organizations. While both jails and prisons can be dangerous places to work, prison populations are more stable than jail populations, and correctional officers in prisons know the security and custodial requirements of the prisoners with whom they are dealing.

Regardless of the setting, correctional officers maintain order within the institution, and enforce rules and regulations. To help ensure that inmates are orderly and obey rules, correctional officers monitor the activities and supervise the work assignments of inmates. Sometimes, it is necessary for officers to search inmates and their living quarters for contraband like weapons or drugs, settle disputes between inmates, and enforce discipline. Correctional officers periodically inspect the facilities, checking cells and other areas of the institution for unsanitary conditions, contraband, fire hazards, and any evidence of infractions of rules. In addition, they routinely inspect locks, window bars, grilles, doors, and gates for signs of tampering. Finally, officers inspect mail and visitors for prohibited items.

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Correctional officers report orally and in writing on inmate conduct and on the quality and quantity of work done by inmates. Officers also report security breaches, disturbances, violations of rules, and any unusual occurrences. They usually keep a daily log or record of their activities. Correctional officers cannot show favoritism and must report any inmate who violates the rules. Should the situation arise, they help the responsible law enforcement authorities investigate crimes committed within their institution or search for escaped inmates.

In jail and prison facilities with direct supervision cellblocks, officers work unarmed. They are equipped with communications devices so that they can summon help if necessary. These officers often work in a cellblock alone, or with another officer, among the 50 to 100 inmates who reside there. The officers enforce regulations primarily through their interpersonal communications skills and the use of progressive sanctions, such as loss of some privileges.

In the highest security facilities where the most dangerous inmates are housed, correctional officers often monitor the activities of prisoners from a centralized control center with the aid of closed-circuit television cameras and a computer tracking system. In such an environment, the inmates may not see anyone but officers for days or weeks at a time and only leave their cells for showers, solitary exercise time, or visitors. Depending on the offender's security classification within the institution, correctional officers may have to restrain inmates in handcuffs and leg irons to safely escort them to and from cells and other areas to see authorized visitors. Officers also escort prisoners between the institution and courtrooms, medical facilities, and other destinations outside the institution.

## Working Conditions

Working in a correctional institution can be stressful and hazardous. Every year, a number of correctional officers are injured in confrontations with inmates. Correctional officers may work indoors or outdoors. Some correctional institutions are well lighted, temperature controlled, and ventilated, while others are old, overcrowded, hot, and noisy. Correctional officers usually work an 8-hour day, 5 days a week, on rotating shifts. Prison and jail security must be provided around the clock, which often means that officers work all hours of the day and night, weekends, and holidays. In addition, officers may be required to work paid overtime.

## Employment

Correctional officers held about 476,000 jobs in 2002. About 3 of every 5 jobs were in State correctional institutions such as prisons, prison camps, and youth correctional facilities. Most of the remaining jobs were in city and county jails or other institutions run by local governments. About 16,000 jobs for correctional officers were in Federal correctional institutions, and about 16,000 jobs were in privately owned and managed prisons.

There are 118 jail systems in the United States that house over 1,000 inmates, all of which are located in urban areas. A significant number work in jails and other facilities located in law enforcement agencies throughout the country. However, most correctional officers work in institutions located in rural areas with smaller inmate populations than those in urban jails.

## Training, Other Qualifications, and Advancement

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Most institutions require correctional officers to be at least 18 to 21 years of age and a U.S. citizen; have a high school education or its equivalent; demonstrate job stability, usually by accumulating two years of work experience; and have no felony convictions. Promotion prospects may be enhanced through obtaining a postsecondary education.

Correctional officers must be in good health. Candidates for employment are generally required to meet formal standards of physical fitness, eyesight, and hearing. In addition, many jurisdictions use standard tests to determine applicant suitability to work in a correctional environment. Good judgment and the ability to think and act quickly are indispensable. Applicants are typically screened for drug abuse, subject to background checks, and required to pass a written examination.

Federal, State, and some local departments of corrections provide training for correctional officers based on guidelines established by the American Correctional Association and the American Jail Association. Some States have regional training academies which are available to local agencies. All States and local correctional agencies provide on-the-job training at the conclusion of formal instruction, including legal restrictions and interpersonal relations. Many systems require firearms proficiency and self-defense skills. Officer trainees typically receive several weeks or months of training in an actual job setting under the supervision of an experienced officer. However, specific entry requirements and on-the-job training vary widely from agency to agency.

Academy trainees generally receive instruction on a number of subjects, including institutional policies, regulations, and operations, as well as custody and security procedures. As a condition of employment, new Federal correctional officers must undergo 200 hours of formal training within the first year of employment. They also must complete 120 hours of specialized training at the U.S. Federal Bureau of Prisons residential training center at Glynco, Georgia within the first 60 days after appointment. Experienced officers receive annual in-service training to keep abreast of new developments and procedures.

Some correctional officers are members of prison tactical response teams, which are trained to respond to disturbances, riots, hostage situations, forced cell moves, and other potentially dangerous confrontations. Team members receive training and practice with weapons, chemical agents, forced entry methods, crisis management, and other tactics.

With education, experience, and training, qualified officers may advance to correctional sergeant. Correctional sergeants supervise correctional officers and usually are responsible for maintaining security and directing the activities of other officers during an assigned shift or in an assigned area. Ambitious and qualified correctional officers can be promoted to supervisory or administrative positions all the way up to warden. Officers sometimes transfer to related areas, such as probation officer, parole officer, or correctional treatment specialist.

## Job Outlook

Job opportunities for correctional officers are expected to be excellent. The need to replace correctional officers who transfer to other occupations, retire, or leave the labor force, coupled with rising employment demand, will generate thousands of job openings each year. In the past, some local and State corrections agencies have experienced difficulty in attracting and keeping qualified applicants, largely due to relatively low salaries and the concentration of jobs in rural locations. This situation is expected to continue.

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Employment of correctional officers is expected to grow faster than the average for all occupations through 2012, as additional officers are hired to supervise and control a growing inmate population. The adoption of mandatory sentencing guidelines calling for longer sentences and reduced parole for inmates will continue to spur demand for correctional officers. Moreover, expansion and new construction of corrections facilities also are expected to create many new jobs for correctional officers, although State and local government budgetary constraints could affect the rate at which new facilities are built and staffed. Some employment opportunities also will arise in the private sector as public authorities contract with private companies to provide and staff corrections facilities.

Layoffs of correctional officers are rare because of increasing offender populations. While officers are allowed to join bargaining units, they are not allowed to strike.

## Earnings

Median annual earnings of correctional officers and jailers were \$32,670 in 2002. The middle 50 percent earned between \$25,950 and \$42,620. The lowest 10 percent earned less than \$22,010, and the highest 10 percent earned more than \$52,370. Median annual earnings in the public sector were \$40,900 in the Federal Government, \$33,260 in State government, and \$31,380 in local government. In the management and public relations industry, where the relatively small number of officers employed by privately operated prisons are classified, median annual earnings were \$21,390. According to the Federal Bureau of Prisons, the starting salary for Federal correctional officers was about \$23,000 a year in 2003. Starting Federal salaries were slightly higher in selected areas where prevailing local pay levels were higher.

Median annual earnings of first-line supervisors/managers of correctional officers were \$44,940 in 2002. The middle 50 percent earned between \$33,730 and \$59,160. The lowest 10 percent earned less than \$29,220, and the highest 10 percent earned more than \$69,370. Median annual earnings were \$43,240 in State government and \$49,120 in local government.

Median annual earnings of bailiffs were \$32,710 in 2002. The middle 50 percent earned between \$22,960 and \$44,280. The lowest 10 percent earned less than \$16,870, and the highest 10 percent earned more than \$55,270. Median annual earnings were \$27,470 in local government.

In addition to typical benefits, correctional officers employed in the public sector usually are provided with uniforms or a clothing allowance to purchase their own uniforms. Civil service systems or merit boards cover officers employed by the Federal Government and most State governments. Their retirement coverage entitles them to retire at age 50 after 20 years of service or at any age with 25 years of service.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Correctional Officers, on the Internet at <http://www.bls.gov/oco/ocos156.htm>.

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## Customer Service Representatives

### Significant Points

- Job prospects are expected to be excellent.
- Most jobs require only a high school diploma.
- Strong verbal communication and listening skills are important.

### Nature of the Work

Customer service representatives are employed by many different types of companies throughout the country to serve as a direct point of contact for customers. They are responsible for ensuring that their company's customers receive an adequate level of service or help with their questions and concerns. These customers may be individual consumers or other companies, and the nature of their service needs can vary considerably.

All customer service representatives interact with customers to provide information in response to inquiries about products or services and to handle and resolve complaints. They communicate with customers through a variety of means—either in person; by telephone, e-mail or regular mail correspondence, or fax; or even over the Internet. Some customer service representatives handle general questions and complaints, whereas others specialize in a particular area.

Many customer inquiries involve routine questions and requests. For example, customer service representatives may be asked to provide a customer with a bank account balance, or to check on the status of an order that has been placed. Obtaining the answers to such questions usually requires simply looking up information on their computer. Other questions are more involved, and may call for additional research or further explanation on the part of the customer service representative. In handling customers' complaints, customer service representatives must attempt to resolve the problem according to guidelines established by the company. These procedures may involve asking questions to determine the validity of a complaint, offering possible solutions, or providing customers with refunds, exchanges, or other offers such as discounts or coupons. In some cases, customer service representatives are required to follow up with an individual customer until a question is answered or an issue is resolved.

Some customer service representatives help people decide what types of products or services would best suit their needs. They may even aid customers in completing purchases or transactions. Although the primary function of customer service representatives is not sales, some may spend a part of their time with customers attempting to convince them to purchase additional products or services. (For information on workers whose primary function is sales, see the statements on sales and related occupations elsewhere in the *Handbook*.) Customer service representatives may also make changes or updates to a customer's profile or account information. They may keep records of transactions and update and maintain databases of information.

Most customer service representatives use computers and telephones extensively in their work. Customer service representatives frequently enter information into a computer as they are speaking to customers. Often, companies have large amounts of data, such as account information, that can be pulled up on a computer screen while the representative is talking to a customer so that he or she can answer specific questions relating to the account. Customer service representatives also may have access to information such as answers to the most

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common customer questions, or guidelines for dealing with complaints. In the event that they encounter a question or situation to which they do not know how to respond, workers consult with a supervisor to determine the best course of action. Customer service representatives use multiline telephones systems, which often route calls directly to the most appropriate representative. However, at times, a customer service representative will need to transfer a call to someone who may be better able to respond to the customer's needs.

In some organizations, customer service representatives spend their entire day on the telephone. In others, they may spend part of their day answering e-mails and the remainder of the day taking calls. For some, most of their contact with the customer is face to face. Customer service representatives need to remain aware of the amount of time spent with each customer, in order to fairly distribute their time among the people who require their assistance. This is particularly important for customer service representatives whose primary activities are answering telephone calls, and conversations often are required to be kept within set time limits. For customer service representatives working in call centers, there is usually very little time between telephone calls; as soon as they have finished with one call they must immediately move on to another. When working in call centers, customer service representatives are likely to be under close supervision. Telephone calls may be taped and reviewed by supervisors to ensure that company policies and procedures are being followed, or a supervisor may listen in on conversations.

Job responsibilities can differ, depending on the industry in which a customer service representative is employed. For example, a customer service representative working in the branch office of a bank may assume the responsibilities of other workers, such as teller or new account clerk, as needed. In insurance agencies, a customer service representative interacts with agents, insurance companies, and policyholders. These workers handle much of the paperwork related to insurance policies, such as policy applications and changes and renewals to existing policies. They answer questions regarding issues such as policy coverage, help with reporting claims, and do anything else that may need to be done. Although they must know as much as insurance agents about insurance products, and usually must have credentials equal to those of an agent in order to sell products and make changes to policies, the duties of a customer service representative differ from those of an agent in that customer service representatives are not responsible for actively seeking potential customers. Customer service representatives employed by communications and utilities companies assist individuals interested in opening accounts for various utilities such as electricity and gas, or for communication services such as cable television and telephone. They explain various options and receive orders for services to be installed, turned on, turned off, or changed. They may also look into and resolve complaints about billing and service provided by telephone, cable television, and utility companies.

## Working Conditions

Although customer service representatives can work in a variety of settings, most work in areas that are clean and well lit. Many work in call or customer contact centers. In this type of environment, workers generally have their own workstation or cubicle space and are equipped with a telephone, headset, and computer. Because many call centers are open extended hours, beyond the traditional 9-to-5 business day, or are staffed around the clock, these positions may require workers to take on early morning, evening, or late night shifts. Weekend or holiday work also may be necessary. As a result, the occupation is well-suited to flexible work schedules. About 1 out of 7 customer service representatives work part time. The occupation also offers the opportunity for seasonal work in certain industries, often through temporary help agencies.

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Call centers may be crowded and noisy, and work may be repetitious and stressful, with little time in between calls. Workers usually must attempt to minimize the length of each call, while still providing excellent service. To ensure that these procedures are followed, conversations may be monitored by supervisors, which can be stressful. Also, long periods spent sitting, typing, or looking at a computer screen may cause eye and muscle strain, backaches, headaches, and repetitive motion injuries.

Customer service representatives working outside of a call center environment may interact with customers through several different means. For example, workers employed by an insurance agency or in a grocery store may have customers approach them in person or contact them by telephone, computer, mail, or fax. Many of these customer service representatives will work a standard 40-hour week; however, their hours generally will depend on the hours of operation of the establishment in which they are employed. Work environments outside of a call center also will vary accordingly. Most customer service representatives will work either in an office or at a service or help desk.

For virtually all types of customer service representatives, dealing with difficult or irate customers can be a trying task; however, the ability to directly help and resolve customers' problems has the potential to be very rewarding.

## Employment

Customer service representatives held about 1.9 million jobs in 2002. Although they were found in a variety of industries, more than 1 in 4 customer service representatives worked in finance and insurance. The largest numbers were employed by insurance carriers, insurance agencies and brokerages, and banks and credit unions.

Nearly 1 in 8 customer service representatives were employed in administrative and support services. These workers were concentrated in the industries business support services--which includes telephone call centers--and employment services--which includes temporary help services and employment placement agencies. Another 1 in 8 customer service representatives were employed in retail trade establishments such as general merchandise stores, food and beverage stores, or nonstore retailers. Other industries that employ significant numbers of customer service representatives include information, particularly the telecommunications industry; manufacturing, such as printing and related support activities; and wholesale trade.

Although they are found in all States, customer service representatives who work in call centers tend to be concentrated geographically. Four States make up over 30 percent of total employment—California, Texas, Florida, and New York. Delaware, South Dakota, Utah, and Arizona have the highest concentration of workers in this occupation, with customer service representatives comprising over 2 percent of total employment in these States.

## Training, Other Qualifications, and Advancement

A high school diploma or the equivalent is the most common educational requirement for customer service representatives. Basic computer knowledge and good interpersonal skills also are important qualities for people who wish to be successful in the field. Because customer service representatives constantly interact with the public, strong communication and problem-solving skills are a must, particularly strong verbal communication and listening skills. Additionally, for those workers who communicate through e-mail, good typing, spelling, and written

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communication skills are necessary. High school courses in computers, English, or business are helpful in preparing for a job in customer service.

Customer service representatives play a critical role in providing an interface between the customer and the company that employs them, and for this reason employers seek out people who are able to come across in a friendly and professional manner. The ability to deal patiently with problems and complaints and to remain courteous when faced with difficult or angry people is very important. Also, a customer service representative needs to be able to work independently within specified time constraints. Workers should have a clear and pleasant speaking voice and be fluent in the English language. However, the ability to speak a foreign language is becoming increasingly necessary, and bilingual skills are considered a plus.

Training requirements vary by industry. Almost all customer service representatives are provided with some training prior to beginning work and training continues once on the job. This training generally will cover four primary components: Training on customer service and phone skills, training on products and services or common customer problems, training on the use or operation of the telephone and/or computer systems, and training on company policies and regulations. Length of training varies, but it usually lasts at least several weeks. Because of a constant need to update skills and knowledge, most customer service representatives continue to receive instruction and training throughout their career. This is particularly true of workers in industries such as banking, in which regulations and products are continually changing.

Although some positions may require previous industry, office, or customer service experience, many customer service jobs are entry level. Customer service jobs are often good introductory positions into a company or an industry. In some cases, experienced workers can move up within the company into supervisory or managerial positions or they may move into areas such as product development, in which they can use their knowledge to improve products and services.

Within insurance agencies and brokerages, however, a customer service representative job is usually not an entry-level position. Workers must have previous experience in insurance and are often required by State regulations to be licensed like insurance sales agents. A variety of designations are available to demonstrate that a candidate has sufficient knowledge and skill, and continuing education and training are often offered through the employer. As they gain more knowledge of industry products and services, customer service representatives in insurance may advance to other, higher level positions, such as insurance sales agent.

## Job Outlook

Prospects for obtaining a job in this field are expected to be excellent, with more job openings than jobseekers. Bilingual jobseekers, in particular, may enjoy favorable job prospects. In addition to many new openings occurring as businesses and organizations expand, numerous job openings will result from the need to replace experienced customer service representatives who transfer to other occupations or leave the labor force. Replacement needs are expected to be significant in this large occupation because many young people work as customer service representatives before switching to other jobs. This occupation is well-suited to flexible work schedules, and many opportunities for part-time work will continue to be available, particularly as organizations attempt to cut labor costs by hiring more temporary workers.

Employment of customer service representatives is expected to grow faster than the average for all occupations through the year 2012. Beyond growth stemming from expansion of the industries in which customer service representatives are employed, a need for additional customer service

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representatives is likely to result from heightened reliance on these workers. Customer service is critical to the success of any organization that deals with customers, and strong customer service can build sales and visibility as companies try to distinguish themselves from competitors. In many industries, the need to gain a competitive edge and retain customers will become increasingly important over the next decade. This is particularly true in industries such as financial services, communications, and utilities that already employ numerous customer service representatives. As the trend towards consolidation within industries continues, centralized call centers will provide an effective method for delivering a high level of customer service. As a result, employment of customer service representatives may grow at a faster rate in call centers than in other areas; however, this growth may be tempered as a variety of factors, including technological improvements, make it increasingly feasible and cost-effective for call centers to be built or relocated outside of the United States. Technology is impacting the occupation in many ways. Advancements such as the Internet and automated teller machines have provided customers with means of obtaining information and conducting transactions that do not entail interacting with another person. Technology also allows for a greater streamlining of processes, while at the same time increasing the productivity of workers. Use of computer software to filter e-mails, generating automatic responses or directing messages to the appropriate representative, and use of similar systems to answer or route telephone inquiries are likely to become more prevalent in the future.

Despite such developments, the need for customer service representatives is expected to remain strong. In many ways, technology has heightened consumers' expectations for information and services, and availability of information online seems to have generated more need for customer service representatives, particularly to respond to e-mail. Also, technology cannot replace the need for human skills. As more sophisticated technologies are able to resolve many customers' questions and concerns, the nature of the inquiries to be handled by customer service representatives is likely to become increasingly complex.

Furthermore, the job responsibilities of customer service representatives are expanding. As companies downsize or look to increase profitability, workers are being trained to perform additional duties such as opening bank accounts or cross-selling products. As a result, employers may increasingly prefer customer service representatives who have education beyond high school, such as some college or even a college degree.

While jobs in some industries, such as retail trade, may be impacted by economic downturns, the occupation is generally resistant to major fluctuations in employment.

## Earnings

In 2002, median annual earnings for wage and salary customer service representatives were \$26,240. The middle 50 percent earned between \$20,960 and \$33,540. The lowest 10 percent earned less than \$17,230, and the highest 10 percent earned more than \$42,990.

Earnings for customer service representatives vary according to level of skill required, experience, training, location, and size of firm. Median annual earnings in the industries employing the largest numbers of these workers in 2002 are shown below:

Wired telecommunications carriers	\$38,980
Insurance carriers	28,560

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Agencies, brokerages, and other insurance related activities	28,270
Management of companies and enterprises	27,990
Nondepository credit intermediation	25,600
Depository credit intermediation	24,850
Employment services	22,510
Electronic shopping and mail-order houses	21,530
Business support services	21,130
Grocery stores	17,230

In addition to receiving an hourly wage, full-time customer service representatives who work evenings, nights, weekends, or holidays may receive shift differential pay. Also, because call centers are often open during extended hours, or even 24 hours a day, some customer service representatives have the benefit of being able to work a schedule that does not conform to the traditional workweek. Other benefits can include life and health insurance, pensions, bonuses, employer-provided training, or discounts on the products and services the company offers.

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Customer Service Representatives, on the Internet at <http://www.bls.gov/oco/ocos280.htm>.

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## Dental Assistants

### Significant Points

- Job prospects should be excellent.
- Dentists are expected to hire more assistants to perform routine tasks so that they may devote their own time to more profitable procedures.
- Most assistants learn their skills on the job, although an increasing number are trained in dental-assisting programs; most programs take 1 year or less to complete.

### Nature of the Work

Dental assistants perform a variety of patient care, office, and laboratory duties. They work chairside as dentists examine and treat patients. They make patients as comfortable as possible in the dental chair, prepare them for treatment, and obtain their dental records. Assistants hand instruments and materials to dentists and keep patients' mouths dry and clear by using suction or other devices. Assistants also sterilize and disinfect instruments and equipment, prepare trays of instruments for dental procedures, and instruct patients on postoperative and general oral health care.

Some dental assistants prepare materials for impressions and restorations, take dental x rays, and process x-ray film as directed by a dentist. They also may remove sutures, apply topical anesthetics to gums or cavity-preventive agents to teeth, remove excess cement used in the filling process, and place rubber dams on the teeth to isolate them for individual treatment.

Those with laboratory duties make casts of the teeth and mouth from impressions, clean and polish removable appliances, and make temporary crowns. Dental assistants with office duties schedule and confirm appointments, receive patients, keep treatment records, send bills, receive payments, and order dental supplies and materials.

Dental assistants should not be confused with dental hygienists, who are licensed to perform different clinical tasks. (See the statement on dental hygienists elsewhere in the *Handbook*.)

### Working Conditions

Dental assistants work in a well-lighted, clean environment. Their work area usually is near the dental chair so that they can arrange instruments, materials, and medication and hand them to the dentist when needed. Dental assistants must wear gloves, masks, eyewear, and protective clothing to protect themselves and their patients from infectious diseases. Following safety procedures also minimizes the risks associated with the use of x-ray machines.

About half of dental assistants have a 35- to 40-hour workweek, which may include work on Saturdays or evenings.

### Employment

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Dental assistants held about 266,000 jobs in 2002. Almost all jobs for dental assistants were in offices of Dentists. A small number of jobs were in offices of physicians, educational services, and hospitals. About a third of dental assistants worked part time, sometimes in more than one dental office.

## Training, Other Qualifications, and Advancement

Most assistants learn their skills on the job, although an increasing number are trained in dental-assisting programs offered by community and junior colleges, trade schools, technical institutes, or the Armed Forces. Assistants must be a second pair of hands for a dentist; therefore, Dentists look for people who are reliable, can work well with others, and have good manual dexterity. High school students interested in a career as a dental assistant should take courses in biology, chemistry, health, and office practices.

The American Dental Association's Commission on Dental Accreditation approved 259 dental-assisting training programs in 2002. Programs include classroom, laboratory, and preclinical instruction in dental-assisting skills and related theory. In addition, students gain practical experience in dental schools, clinics, or dental offices. Most programs take 1 year or less to complete and lead to a certificate or diploma. Two-year programs offered in community and junior colleges lead to an associate degree. All programs require a high school diploma or its equivalent, and some require science or computer-related courses for admission. A number of private vocational schools offer 4- to 6-month courses in dental assisting, but the Commission on Dental Accreditation does not accredit these programs.

Most States regulate the duties that dental assistants are allowed to perform through licensure or registration. Licensure or registration may require passing a written or practical examination. States offering licensure or registration have a variety of schools offering courses—approximately 10 to 12 months in length—that meet their State's requirements. Many States require continuing education to maintain licensure or registration. A few States allow dental assistants to perform any function delegated to them by the dentist.

Individual States have adopted different standards for dental assistants who perform certain advanced duties, such as radiological procedures. The completion of the Radiation Health and Safety examination offered by the Dental Assisting National Board (DANB) meets those standards in more than 30 States. Some States require the completion of a State-approved course in radiology as well.

Certification is available through DANB and is recognized or required in more than 30 States. Other organizations offer registration, most often at the State level. Certification is an acknowledgment of an assistant's qualifications and professional competence and may be an asset when one is seeking employment. Candidates may qualify to take the DANB certification examination by graduating from an accredited training program or by having 2 years of full-time, or 4 years of part-time, experience as a dental assistant. In addition, applicants must have current certification in cardiopulmonary resuscitation. For annual recertification, individuals must earn continuing education credits.

Without further education, advancement opportunities are limited. Some dental assistants become office managers, dental-assisting instructors, or dental product sales representatives. Others go back to school to become dental hygienists. For many, this entry-level occupation provides basic training and experience and serves as a steppingstone to more highly skilled and higher paying jobs.

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## Job Outlook

Job prospects for dental assistants should be excellent. Employment is expected to grow much faster than the average for all occupations through the year 2012. In fact, dental assistants is expected to be one of the fastest growing occupations through the year 2012.

In addition to job openings due to employment growth, numerous job openings will arise out of the need to replace assistants who transfer to other occupations, retire, or leave the labor force for other reasons. Many opportunities are for entry-level positions offering on-the-job training.

Population growth and greater retention of natural teeth by middle-aged and older people will fuel demand for dental services. Older dentists, who have been less likely to employ assistants, are leaving the occupation and will be replaced by recent graduates, who are more likely to use one or even two assistants. In addition, as Dentists' workloads increase, they are expected to hire more assistants to perform routine tasks, so that they may devote their own time to more profitable procedures.

## Earnings

Median hourly earnings of dental assistants were \$13.10 in 2002. The middle 50 percent earned between \$10.35 and \$16.20 an hour. The lowest 10 percent earned less than \$8.45, and the highest 10 percent earned more than \$19.41 an hour.

Benefits vary substantially by practice setting and may be contingent upon full-time employment. According to the American Dental Association, almost all full-time dental assistants employed by private practitioners received paid vacation time. The ADA also found that 9 out of 10 full-time and part-time dental assistants received dental coverage.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Dental Assistants, on the Internet at <http://www.bls.gov/oco/ocos163.htm>.

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## Dental Hygienists

### Significant Points

- Most dental hygiene programs grant an associate degree; others offer a certificate, a bachelor's degree, or a master's degree.
- Job prospects are expected to remain excellent.
- Opportunities for part-time work and flexible schedules are common.

### Nature of the Work

Dental hygienists remove soft and hard deposits from teeth, teach patients how to practice good oral hygiene, and provide other preventive dental care. Hygienists examine patients' teeth and gums, recording the presence of diseases or abnormalities. They remove calculus, stains, and plaque from teeth; perform root planing as a periodontal therapy; take and develop dental x rays; and apply cavity-preventive agents such as fluorides and pit and fissure sealants. In some States, hygienists administer anesthetics; place and carve filling materials, temporary fillings, and periodontal dressings; remove sutures; and smooth and polish metal restorations. Although hygienists may not diagnose diseases, they can prepare clinical and laboratory diagnostic tests for the dentist to interpret. Hygienists sometimes work chairside with the dentist during treatment.

Dental hygienists also help patients develop and maintain good oral health. For example, they may explain the relationship between diet and oral health or inform patients how to select toothbrushes and show them how to brush and floss their teeth.

Dental hygienists use hand and rotary instruments and ultrasonics to clean and polish teeth, x-ray machines to take dental pictures, syringes with needles to administer local anesthetics, and models of teeth to explain oral hygiene.

### Working Conditions

Flexible scheduling is a distinctive feature of this job. Full-time, part-time, evening, and weekend schedules are widely available. Dentists frequently hire hygienists to work only 2 or 3 days a week, so hygienists may hold jobs in more than one dental office.

Dental hygienists work in clean, well-lighted offices. Important health safeguards include strict adherence to proper radiological procedures, and the use of appropriate protective devices when administering anesthetic gas. Dental hygienists also wear safety glasses, surgical masks, and gloves to protect themselves and patients from infectious diseases.

### Employment

Dental hygienists held about 148,000 jobs in 2002. Because multiple jobholding is common in this field, the number of jobs exceeds the number of hygienists. More than half of all dental hygienists worked part time—less than 35 hours a week.

Almost all jobs for dental hygienists were in offices of dentists. A very small number worked for employment services or in offices of physicians.

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## Training, Other Qualifications, and Advancement

Dental hygienists must be licensed by the State in which they practice. To qualify for licensure, a candidate must graduate from an accredited dental hygiene school and pass both a written and clinical examination. The American Dental Association Joint Commission on National Dental Examinations administers the written examination, which is accepted by all States and the District of Columbia. State or regional testing agencies administer the clinical examination. In addition, most States require an examination on the legal aspects of dental hygiene practice. Alabama allows candidates to take its examinations if they have been trained through a State-regulated on-the-job program in a dentist's office.

In 2002, the Commission on Dental Accreditation accredited about 265 programs in dental hygiene. Most dental hygiene programs grant an associate degree, although some also offer a certificate, a bachelor's degree, or a master's degree. A minimum of an associate degree or certificate in dental hygiene is required for practice in a private dental office. A bachelor's or master's degree usually is required for research, teaching, or clinical practice in public or school health programs.

About half of the dental hygiene programs prefer applicants who have completed at least 1 year of college. However, requirements vary from one school to another. Schools offer laboratory, clinical, and classroom instruction in subjects such as anatomy, physiology, chemistry, microbiology, pharmacology, nutrition, radiography, histology (the study of tissue structure), periodontology (the study of gum diseases), pathology, dental materials, clinical dental hygiene, and social and behavioral sciences.

Dental hygienists should work well with others and must have good manual dexterity, because they use dental instruments within a patient's mouth, with little room for error. High school students interested in becoming a dental hygienist should take courses in biology, chemistry, and mathematics.

## Job Outlook

Employment of dental hygienists is expected to grow much faster than the average for all occupations through 2012, in response to increasing demand for dental care and the greater utilization of hygienists to perform services previously performed by dentists. Job prospects are expected to remain excellent. In fact, dental hygienists is expected to be one of the fastest growing occupations through the year 2012.

Population growth and greater retention of natural teeth will stimulate demand for dental hygienists. Older dentists, who have been less likely to employ dental hygienists, are leaving the occupation and will be replaced by recent graduates, who are more likely to employ one or even two hygienists. In addition, as dentists' workloads increase, they are expected to hire more hygienists to perform preventive dental care, such as cleaning, so that they may devote their own time to more profitable procedures.

## Earnings

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Median hourly earnings of dental hygienists were \$26.59 in 2002. The middle 50 percent earned between \$21.96 and \$32.48 an hour. The lowest 10 percent earned less than \$17.34, and the highest 10 percent earned more than \$39.24 an hour.

Earnings vary by geographic location, employment setting, and years of experience. Dental hygienists may be paid on an hourly, daily, salary, or commission basis.

Benefits vary substantially by practice setting and may be contingent upon full-time employment. According to the American Dental Association, almost all full-time dental hygienists employed by private practitioners received paid vacation. The ADA also found that 9 out of 10 full-time and part-time dental hygienists received dental coverage. Dental hygienists who work for school systems, public health agencies, the Federal Government, or State agencies usually have substantial benefits.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Dental Hygienists, on the Internet at <http://www.bls.gov/oco/ocos097.htm>.

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## Electricians

### Significant Points

- Job opportunities are expected to be good.
- Most electricians acquire their skills by completing an apprenticeship program lasting 3 to 5 years.
- More than one-quarter of wage and salary electricians work in industries other than construction.

### Nature of the Work

Electricity is essential for light, power, air-conditioning, and refrigeration. Electricians install, connect, test, and maintain electrical systems for a variety of purposes, including climate control, security, and communications. They also may install and maintain the electronic controls for machines in business and industry. Although most electricians specialize in construction or maintenance, a growing number do both.

Electricians work with blueprints when they install electrical systems in factories, office buildings, homes, and other structures. Blueprints indicate the locations of circuits, outlets, load centers, panel boards, and other equipment. Electricians must follow the National Electric Code and comply with State and local building codes when they install these systems. In factories and offices, they first place conduit (pipe or tubing) inside designated partitions, walls, or other concealed areas. They also fasten to the walls small metal or plastic boxes that will house electrical switches and outlets. They then pull insulated wires or cables through the conduit to complete circuits between these boxes. In lighter construction, such as residential, plastic-covered wire usually is used instead of conduit.

Regardless of the type of wire used, electricians connect it to circuit breakers, transformers, or other components. They join the wires in boxes with various specially designed connectors. After they finish the wiring, they use testing equipment, such as ohmmeters, voltmeters, and oscilloscopes, to check the circuits for proper connections, ensuring electrical compatibility and safety of components.

Electricians also may install low voltage wiring systems in addition to wiring a building's electrical system. Low voltage wiring involves voice, data, and video wiring systems, such as those for telephones, computers and related equipment, intercoms, and fire alarm and security systems. Electricians also may install coaxial or fiber optic cable for computers and other telecommunications equipment and electronic controls for industrial equipment.

Maintenance work varies greatly, depending on where the electrician is employed. Electricians who specialize in residential work may rewire a home and replace an old fuse box with a new circuit breaker box to accommodate additional appliances. Those who work in large factories may repair motors, transformers, generators, and electronic controllers on machine tools and industrial robots. Those in office buildings and small plants may repair all types of electrical equipment.

*Maintenance electricians* spend much of their time doing preventive maintenance. They periodically inspect equipment, and locate and correct problems before breakdowns occur. Electricians may also advise management whether continued operation of equipment could be

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hazardous. When needed, they install new electrical equipment. When breakdowns occur, they must make the necessary repairs as quickly as possible in order to minimize inconvenience. Electricians may replace items such as circuit breakers, fuses, switches, electrical and electronic components, or wire. When working with complex electronic devices, they may work with engineers, engineering technicians, or industrial machinery installation, repair, and maintenance workers. (Statements on these occupations appear elsewhere in the *Handbook*.)

Electricians use handtools such as screwdrivers, pliers, knives, hacksaws, and wire strippers. They also use a variety of power tools as well as testing equipment such as oscilloscopes, ammeters, and test lamps.

## Working Conditions

Electricians' work is sometimes strenuous. They bend conduit, stand for long periods, and frequently work on ladders and scaffolds. Their working environment varies, depending on the type of job. Some may work in dusty, dirty, hot, or wet conditions, or in confined areas, ditches, or other uncomfortable places. Electricians risk injury from electrical shock, falls, and cuts; to avoid injuries, they must follow strict safety procedures. Some electricians may have to travel great distances to jobsites.

Most electricians work a standard 40-hour week, although overtime may be required. Those in maintenance work may work nights or weekends, and be on call. Maintenance electricians may also have periodic extended overtime during scheduled maintenance or retooling periods. Companies that operate 24 hours a day may employ three shifts of electricians.

## Employment

Electricians held about 659,000 jobs in 2002. More than one-quarter of wage and salary workers were employed in the construction industry; while the remainder worked as maintenance electricians employed outside the construction industry. In addition, about one in ten electricians were self-employed.

Because of the widespread need for electrical services, jobs for electricians are found in all parts of the country.

## Training, Other Qualifications, and Advancement

Most people learn the electrical trade by completing an apprenticeship program lasting 3 to 5 years. Apprenticeship gives trainees a thorough knowledge of all aspects of the trade and generally improves their ability to find a job. Although electricians are more likely to be trained through apprenticeship than are workers in other construction trades, some still learn their skills informally on the job. Others train to be residential electricians in a 3-year program.

Apprenticeship programs may be sponsored by joint training committees made up of local unions of the International Brotherhood of Electrical Workers and local chapters of the National Electrical Contractors Association; company management committees of individual electrical contracting companies; or local chapters of the Associated Builders and Contractors and the Independent Electrical Contractors Association. Because of the comprehensive training received, those who complete apprenticeship programs qualify to do both maintenance and construction work.

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The typical large apprenticeship program provides at least 144 hours of classroom instruction and 2,000 hours of on-the-job training each year. In the classroom, apprentices learn blueprint reading, electrical theory, electronics, mathematics, electrical code requirements, and safety and first aid practices. They also may receive specialized training in welding, communications, fire alarm systems, and cranes and elevators. On the job, under the supervision of experienced electricians, apprentices must demonstrate mastery of the electrician's work. At first, they drill holes, set anchors, and set up conduit. Later, they measure, fabricate, and install conduit, as well as install, connect, and test wiring, outlets, and switches. They also learn to set up and draw diagrams for entire electrical systems.

After finishing an apprenticeship, journeymen often continue to learn about related electrical systems, such as low voltage voice, data, and video systems. Many builders and owners want to work with only one contractor who can install or repair both regular electrical systems and low voltage systems.

Those who do not enter a formal apprenticeship program can begin to learn the trade informally by working as helpers for experienced electricians. While learning to install conduit, connect wires, and test circuits, helpers also learn safety practices. Many helpers supplement this training with trade school or correspondence courses.

Regardless of how one learns the trade, previous training is very helpful. High school courses in mathematics, electricity, electronics, mechanical drawing, science, and shop provide a good background. Special training offered in the U.S. Armed Forces and by postsecondary technical schools also is beneficial. All applicants should be in good health and have at least average physical strength. Agility and dexterity also are important. Good color vision is needed because workers frequently must identify electrical wires by color.

Most apprenticeship sponsors require applicants for apprentice positions to be at least 18 years old, have a high school diploma or its equivalent, and be able to pass a skills test. For those interested in becoming maintenance electricians, a background in electronics is increasingly important because of the growing use of complex electronic controls on manufacturing equipment.

Most localities require electricians to be licensed. Although licensing requirements vary from area to area, electricians usually must pass an examination that tests their knowledge of electrical theory, the National Electrical Code, and local electric and building codes. Electricians periodically take courses offered by their employer or union to keep abreast of changes in the National Electrical Code, materials, or methods of installation.

Experienced electricians can become supervisors and then superintendents. Those with sufficient capital and management skills may start their own contracting business, although this may require an electrical contractor's license. Many electricians become electrical inspectors.

## Job Outlook

Job opportunities for electricians are expected to be good. Numerous openings will arise each year as experienced electricians leave the occupation. In addition, many potential workers may choose not to enter training programs because they prefer work that is less strenuous and has more comfortable working conditions.

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Employment of electricians is expected to grow faster than the average for all occupations through the year 2012. As the population and economy grow, more electricians will be needed to install and maintain electrical devices and wiring in homes, factories, offices, and other structures. New technologies also are expected to continue to stimulate the demand for these workers. For example, buildings will be prewired during construction to accommodate use of computers and telecommunications equipment. More factories will be using robots and automated manufacturing systems. Additional jobs will be created by rehabilitation and retrofitting of existing structures.

In addition to jobs created by increased demand for electrical work, many openings will occur each year as electricians transfer to other occupations, retire, or leave the labor force for other reasons. Because the training for this occupation is long and difficult and the earnings are relatively high, a smaller proportion of electricians than of other craftworkers leave the occupation each year. The number of retirements is expected to rise, however, as more electricians reach retirement age.

Employment of construction electricians, like that of many other construction workers, is sensitive to changes in the economy. This results from the limited duration of construction projects and the cyclical nature of the construction industry. During economic downturns, job openings for electricians are reduced as the level of construction activity declines. Apprenticeship opportunities also are less plentiful during these periods.

Although employment of maintenance electricians is steadier than that of construction electricians, those working in the automotive and other manufacturing industries that are sensitive to cyclical swings in the economy may be laid off during recessions. Also, efforts to reduce operating costs and increase productivity through the increased use of contracting out for electrical services may limit opportunities for maintenance electricians in many industries. However, this should be partially offset by increased job opportunities for electricians in electrical contracting firms.

Job opportunities for electricians also vary by area. Employment opportunities follow the movement of people and businesses among States and local areas, and reflect differences in local economic conditions. The number of job opportunities in a given year may fluctuate widely from area to area.

## Earnings

In 2002, median hourly earnings of electricians were \$19.90. The middle 50 percent earned between \$14.95 and \$26.50. The lowest 10 percent earned less than \$11.81, and the highest 10 percent earned more than \$33.21. Median hourly earnings in the industries employing the largest numbers of electricians in 2002 are shown below:

Motor vehicle parts manufacturing	\$28.72
Local government	21.15
Building equipment contractors	19.54
Nonresidential building construction	19.36
Employment services	15.46

Depending on experience, apprentices usually start at between 40 and 50 percent of the rate paid to fully trained electricians. As apprentices become more skilled, they receive periodic increases

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throughout the course of their training. Many employers also provide training opportunities for experienced electricians to improve their skills.

Many construction electricians are members of the International Brotherhood of Electrical Workers. Among unions organizing maintenance electricians are the International Brotherhood of Electrical Workers; the International Union of Electronic, Electrical, Salaried, Machine, and Furniture Workers; the International Association of Machinists and Aerospace Workers; the International Union, United Automobile, Aircraft and Agricultural Implement Workers of America; and the United Steelworkers of America.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Electricians, on the Internet at <http://www.bls.gov/oco/ocos206.htm>.

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## Emergency Medical Technicians and Paramedics

### Significant Points

- Job stress is common because hours of work are irregular and workers often must treat patients in life-or-death situations.
- Formal training and certification are required, but State requirements vary.
- Employment is projected to grow faster than average as paid emergency medical technician positions replace unpaid volunteers.
- Competition will be greater for jobs in local fire, police, and rescue squad departments than in private ambulance services; opportunities will be best for those who have advanced certification.

### Nature of the Work

People's lives often depend on the quick reaction and competent care of emergency medical technicians (EMTs) and paramedics—EMTs with additional advanced training to perform more difficult prehospital medical procedures. Incidents as varied as automobile accidents, heart attacks, drownings, childbirth, and gunshot wounds all require immediate medical attention. EMTs and paramedics provide this vital attention as they care for and transport the sick or injured to a medical facility.

In an emergency, EMTs and paramedics typically are dispatched to the scene by a 911 operator, and often work with police and fire department personnel. (Police and detectives and firefighting occupations are discussed elsewhere in the *Handbook*.) Once they arrive, they determine the nature and extent of the patient's condition while trying to ascertain whether the patient has preexisting medical problems. Following strict rules and guidelines, they give appropriate emergency care and, when necessary, transport the patient. Some paramedics are trained to treat patients with minor injuries on the scene of an accident or at their home without transporting them to a medical facility. Emergency treatment for more complicated problems is carried out under the direction of medical doctors by radio preceding or during transport.

EMTs and paramedics may use special equipment, such as backboards, to immobilize patients before placing them on stretchers and securing them in the ambulance for transport to a medical facility. Usually, one EMT or paramedic drives while the other monitors the patient's vital signs and gives additional care as needed. Some EMTs work as part of the flight crew of helicopters that transport critically ill or injured patients to hospital trauma centers.

At the medical facility, EMTs and paramedics help transfer patients to the emergency department, report their observations and actions to emergency room staff, and may provide additional emergency treatment. After each run, EMTs and paramedics replace used supplies and check equipment. If a transported patient had a contagious disease, EMTs and paramedics decontaminate the interior of the ambulance and report cases to the proper authorities.

Beyond these general duties, the specific responsibilities of EMTs and paramedics depend on their level of qualification and training. To determine this, the National Registry of Emergency Medical Technicians (NREMT) registers emergency medical service (EMS) providers at four levels: First Responder, EMT-Basic, EMT-Intermediate, and EMT-Paramedic. Some States, however, do their own certification and use numeric ratings from 1 to 4 to distinguish levels of proficiency.

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The lowest-level workers—First Responders—are trained to provide basic emergency medical care because they tend to be the first persons to arrive at the scene of an incident. Many firefighters, police officers, and other emergency workers have this level of training. The EMT-Basic, also known as EMT-1, represents the first component of the emergency medical technician system. An EMT-1 is trained to care for patients at the scene of an accident and while transporting patients by ambulance to the hospital under medical direction. The EMT-1 has the emergency skills to assess a patient's condition and manage respiratory, cardiac, and trauma emergencies.

The EMT-Intermediate (EMT-2 and EMT-3) has more advanced training that allows the administration of intravenous fluids, the use of manual defibrillators to give lifesaving shocks to a stopped heart, and the application of advanced airway techniques and equipment to assist patients experiencing respiratory emergencies. EMT-Paramedics (EMT-4) provide the most extensive prehospital care. In addition to carrying out the procedures already described, paramedics may administer drugs orally and intravenously, interpret electrocardiograms (EKGs), perform endotracheal intubations, and use monitors and other complex equipment.

## Working Conditions

EMTs and paramedics work both indoors and outdoors, in all types of weather. They are required to do considerable kneeling, bending, and heavy lifting. These workers risk noise-induced hearing loss from sirens and back injuries from lifting patients. In addition, EMTs and paramedics may be exposed to diseases such as hepatitis-B and AIDS, as well as violence from drug overdose victims or mentally unstable patients. The work is not only physically strenuous, but also stressful, involving life-or-death situations and suffering patients. Nonetheless, many people find the work exciting and challenging and enjoy the opportunity to help others.

EMTs and paramedics employed by fire departments work about 50 hours a week. Those employed by hospitals frequently work between 45 and 60 hours a week, and those in private ambulance services, between 45 and 50 hours. Some of these workers, especially those in police and fire departments, are on call for extended periods. Because emergency services function 24 hours a day, EMTs and paramedics have irregular working hours that add to job stress.

## Employment

EMTs and paramedics held about 179,000 jobs in 2002. Most career EMTs and paramedics work in metropolitan areas. There are many more volunteer EMTs and paramedics, especially in smaller cities, towns, and rural areas. These individuals volunteer for fire departments, emergency medical services (EMS), or hospitals, and may respond to only a few calls for service per month or may answer the majority of calls, especially in smaller communities. EMTs and paramedics work closely with firefighters, who often are certified as EMTs as well and act as first responders.

Full-time and part-time paid EMTs and paramedics were employed in a number of industries. About 4 out of 10 worked as employees of private ambulance services. About 3 out of 10 worked in local government for fire departments, public ambulance services, and EMS. Another 2 out of 10 were found in hospitals, working full time within the medical facility or responded to calls in ambulances or helicopters to transport critically ill or injured patients. The remainder worked in various industries providing emergency services.

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## Training, Other Qualifications, and Advancement

Formal training and certification is needed to become an EMT or paramedic. All 50 States have a certification procedure. In most States and the District of Columbia, registration with the NREMT is required at some or all levels of certification. Other States administer their own certification examination or provide the option of taking the NREMT examination. To maintain certification, EMTs and paramedics must reregister, usually every 2 years. In order to reregister, an individual must be working as an EMT or paramedic and meet a continuing education requirement.

Training is offered at progressive levels: EMT-Basic, also known as EMT-1; EMT-Intermediate, or EMT-2 and EMT-3; and EMT-Paramedic, or EMT-4. EMT-Basic coursework typically emphasizes emergency skills, such as managing respiratory, trauma, and cardiac emergencies, and patient assessment. Formal courses are often combined with time in an emergency room or ambulance. The program also provides instruction and practice in dealing with bleeding, fractures, airway obstruction, cardiac arrest, and emergency childbirth. Students learn how to use and maintain common emergency equipment, such as backboards, suction devices, splints, oxygen delivery systems, and stretchers. Graduates of approved EMT basic training programs who pass a written and practical examination administered by the State certifying agency or the NREMT earn the title "Registered EMT-Basic." The course also is a prerequisite for EMT-Intermediate and EMT-Paramedic training.

EMT-Intermediate training requirements vary from State to State. Applicants can opt to receive training in EMT-Shock Trauma, wherein the caregiver learns to start intravenous fluids and give certain medications, or in EMT-Cardiac, which includes learning heart rhythms and administering advanced medications. Training commonly includes 35 to 55 hours of additional instruction beyond EMT-Basic coursework, and covers patient assessment as well as the use of advanced airway devices and intravenous fluids. Prerequisites for taking the EMT-Intermediate examination include registration as an EMT-Basic, required classroom work, and a specified amount of clinical experience.

The most advanced level of training for this occupation is EMT-Paramedic. At this level, the caregiver receives additional training in body function and learns more advanced skills. The Technology program usually lasts up to 2 years and results in an associate degree in applied science. Such education prepares the graduate to take the NREMT examination and become certified as an EMT-Paramedic. Extensive related coursework and clinical and field experience is required. Due to the longer training requirement, almost all EMT-Paramedics are in paid positions, rather than being volunteers. Refresher courses and continuing education are available for EMTs and paramedics at all levels.

EMTs and paramedics should be emotionally stable, have good dexterity, agility, and physical coordination, and be able to lift and carry heavy loads. They also need good eyesight (corrective lenses may be used) with accurate color vision.

Advancement beyond the EMT-Paramedic level usually means leaving fieldwork. An EMT-Paramedic can become a supervisor, operations manager, administrative director, or executive director of emergency services. Some EMTs and paramedics become instructors, dispatchers, or physician assistants, while others move into sales or marketing of emergency medical equipment. A number of people become EMTs and paramedics to assess their interest in healthcare, and then decide to return to school and become registered nurses, physicians, or other health workers.

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## Job Outlook

Employment of emergency medical technicians and paramedics is expected to grow faster than the average for all occupations through 2012. Population growth and urbanization will increase the demand for full-time paid EMTs and paramedics rather than for volunteers. In addition, a large segment of the population—the aging baby boomers—will further spur demand for EMT services as they become more likely to have medical emergencies. There will still be demand for part-time, volunteer EMTs and paramedics in rural areas and smaller metropolitan areas. In addition to those arising from job growth, openings will occur because of replacement needs; some workers leave the occupation because of stressful working conditions, limited potential for advancement, and the modest pay and benefits in private-sector jobs.

Most opportunities for EMTs and paramedics are expected to be found in private ambulance services. Competition will be greater for jobs in local government, including fire, police, and independent third-service rescue squad departments, in which salaries and benefits tend to be slightly better. Opportunities will be best for those who have advanced certifications, such as EMT-Intermediate and EMT-Paramedic, as clients and patients demand higher levels of care before arriving at the hospital.

## Earnings

Earnings of EMTs and paramedics depend on the employment setting and geographic location as well as the individual's training and experience. Median annual earnings of EMTs and paramedics were \$24,030 in 2002. The middle 50 percent earned between \$19,040 and \$31,600. The lowest 10 percent earned less than \$15,530, and the highest 10 percent earned more than \$41,980. Median annual earnings in the industries employing the largest numbers of EMTs and paramedics in 2002 were:

Local government	\$27,440
General medical and surgical hospitals	24,760
Other ambulatory health care services	22,180

Those in emergency medical services who are part of fire or police departments receive the same benefits as firefighters or police officers. For example, many are covered by pension plans that provide retirement at half pay after 20 or 25 years of service or if the worker is disabled in the line of duty.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Emergency Medical Technicians and Paramedics, on the Internet at <http://www.bls.gov/oco/ocos101.htm>.

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## Firefighting Occupations

### Significant Points

- ☞ Firefighting involves hazardous conditions and long, irregular hours.
- ☞ About 9 out of 10 firefighting workers were employed by municipal or county fire departments.
- ☞ Applicants for municipal firefighting jobs generally must pass written, physical, and medical examinations.
- ☞ Keen competition for jobs is expected.

### Nature of the Work

Every year, fires and other emergencies take thousands of lives and destroy property worth billions of dollars. Firefighters help protect the public against these dangers by rapidly responding to a variety of emergencies. They are frequently the first emergency personnel at the scene of a traffic accident or medical emergency and may be called upon to put out a fire, treat injuries, or perform other vital functions.

During duty hours, firefighters must be prepared to respond immediately to a fire or any other emergency that arises. Because fighting fires is dangerous and complex, it requires organization and teamwork. At every emergency scene, firefighters perform specific duties assigned by a superior officer. At fires, they connect hose lines to hydrants, operate a pump to send water to high pressure hoses, and position ladders to enable them to deliver water to the fire. They also rescue victims and provide emergency medical attention as needed, ventilate smoke-filled areas, and attempt to salvage the contents of buildings. Their duties may change several times while the company is in action. Sometimes they remain at the site of a disaster for days at a time, rescuing trapped survivors and assisting with medical treatment.

Firefighters have assumed a range of responsibilities, including emergency medical services. In fact, most calls to which firefighters respond involve medical emergencies, and about half of all fire departments provide ambulance service for victims. Firefighters receive training in emergency medical procedures, and many fire departments require them to be certified as emergency medical technicians. (For more information, see the *Handbook* statement on emergency medical technicians and paramedics.)

Firefighters work in a variety of settings, including urban and suburban areas, airports, chemical plants, other industrial sites, and rural areas like grasslands and forests. In addition, some firefighters work in hazardous materials units that are trained for the control, prevention, and cleanup of oil spills and other hazardous materials incidents. (For more information, see the *Handbook* statement on hazardous material removal workers.) Workers in urban and suburban areas, airports, and industrial sites typically use conventional firefighting equipment and tactics, while forest fires and major hazardous materials spills call for different methods.

In national forests and parks, *forest fire inspectors and prevention specialists* spot fires from watchtowers and report their findings to headquarters by telephone or radio. Forest rangers patrol to ensure travelers and campers comply with fire regulations. When fires break out, crews of firefighters are brought in to suppress the blaze using heavy equipment, handtools, and water hoses. Forest firefighting, like urban firefighting, can be rigorous work. One of the most effective means of battling the blaze is by creating fire lines through cutting down trees and digging out

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grass and all other combustible vegetation, creating bare land in the path of the fire that deprives it of fuel. Elite firefighters, called smoke jumpers, parachute from airplanes to reach otherwise inaccessible areas. This can be extremely hazardous because the crews have no way to escape if the wind shifts and causes the fire to burn toward them.

Between alarms, firefighters clean and maintain equipment, conduct practice drills and fire inspections, and participate in physical fitness activities. They also prepare written reports on fire incidents and review fire science literature to keep abreast of technological developments and changing administrative practices and policies.

Most fire departments have a fire prevention division, usually headed by a fire marshal and staffed by *fire inspectors*. Workers in this division conduct inspections of structures to prevent fires and ensure fire code compliance. These firefighters also work with developers and planners to check and approve plans for new buildings. Fire prevention personnel often speak on these subjects in schools and before public assemblies and civic organizations.

Some firefighters become *fire investigators*, who determine the origin and causes of fires. They collect evidence, interview witnesses, and prepare reports on fires in cases where the cause may be arson or criminal negligence. They often are called upon to testify in court.

## Working Conditions

Firefighters spend much of their time at fire stations, which usually have features common to a residential facility like a dormitory. When an alarm sounds, firefighters respond rapidly, regardless of the weather or hour. Firefighting involves risk of death or injury from sudden cave-ins of floors, toppling walls, traffic accidents when responding to calls, and exposure to flames and smoke. Firefighters may also come in contact with poisonous, flammable, or explosive gases and chemicals, as well as radioactive or other hazardous materials that may have immediate or long-term effects on their health. For these reasons, they must wear protective gear that can be very heavy and hot.

Work hours of firefighters are longer and vary more widely than hours of most other workers. Many work more than 50 hours a week, and sometimes they may work even longer. In some agencies, they are on duty for 24 hours, then off for 48 hours, and receive an extra day off at intervals. In others, they work a day shift of 10 hours for 3 or 4 days, a night shift of 14 hours for 3 or 4 nights, have 3 or 4 days off, and then repeat the cycle. In addition, firefighters often work extra hours at fires and other emergencies and are regularly assigned to work on holidays. Fire lieutenants and fire captains often work the same hours as the firefighters they supervise. Duty hours include time when firefighters study, train, and perform fire prevention duties.

## Employment

Employment figures in this *Handbook* statement include only paid career firefighters—they do not cover volunteer firefighters, who perform the same duties and may comprise the majority of firefighters in a residential area. According the United States Fire Administration, nearly 70 percent of fire companies are staffed by volunteer fire fighters. Paid career firefighters held about 282,000 jobs in 2002. First-line supervisors/managers of firefighting and prevention workers held about 63,000 jobs; and fire inspectors held about 14,000.

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About 9 out of 10 firefighting workers were employed by municipal or county fire departments. Some large cities have thousands of career firefighters, while many small towns have only a few. Most of the remainder worked in fire departments on Federal and State installations, including airports. Private firefighting companies employ a small number of firefighters and usually operate on a subscription basis.

In response to the expanding role of firefighters, some municipalities have combined fire prevention, public fire education, safety, and emergency medical services into a single organization commonly referred to as a public safety organization. Some local and regional fire departments are being consolidated into countywide establishments in order to reduce administrative staffs and cut costs, and to establish consistent training standards and work procedures.

## Training, Other Qualifications, and Advancement

Applicants for municipal firefighting jobs generally must pass a written exam; tests of strength, physical stamina, coordination, and agility; and a medical examination that includes drug screening. Workers may be monitored on a random basis for drug use after accepting employment. Examinations are generally open to persons who are at least 18 years of age and have a high school education or the equivalent. Those who receive the highest scores in all phases of testing have the best chances for appointment. The completion of community college courses in fire science may improve an applicant's chances for appointment. In recent years, an increasing proportion of entrants to this occupation have had some postsecondary education.

As a rule, entry-level workers in large fire departments are trained for several weeks at the department's training center or academy. Through classroom instruction and practical training, the recruits study firefighting techniques, fire prevention, hazardous materials control, local building codes, and emergency medical procedures, including first aid and cardiopulmonary resuscitation. They also learn how to use axes, chain saws, fire extinguishers, ladders, and other firefighting and rescue equipment. After successfully completing this training, they are assigned to a fire company, where they undergo a period of probation.

A number of fire departments have accredited apprenticeship programs lasting up to 5 years. These programs combine formal, technical instruction with on-the-job training under the supervision of experienced firefighters. Technical instruction covers subjects such as firefighting techniques and equipment, chemical hazards associated with various combustible building materials, emergency medical procedures, and fire prevention and safety. Fire departments frequently conduct training programs, and some firefighters attend training sessions sponsored by the U.S. National Fire Academy. These training sessions cover topics including executive development, anti-arson techniques, disaster preparedness, hazardous materials control, and public fire safety and education. Some States also have extensive firefighter training and certification programs. In addition, a number of colleges and universities offer courses leading to 2- or 4-year degrees in fire engineering or fire science. Many fire departments offer firefighters incentives such as tuition reimbursement or higher pay for completing advanced training.

Among the personal qualities firefighters need are mental alertness, self-discipline, courage, mechanical aptitude, endurance, strength, and a sense of public service. Initiative and good judgment are also extremely important because firefighters make quick decisions in emergencies. Because members of a crew live and work closely together under conditions of stress and danger for extended periods, they must be dependable and able to get along well with others. Leadership

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qualities are necessary for officers, who must establish and maintain discipline and efficiency, as well as direct the activities of firefighters in their companies.

Most experienced firefighters continue studying to improve their job performance and prepare for promotion examinations. To progress to higher level positions, they acquire expertise in advanced firefighting equipment and techniques, building construction, emergency medical technology, writing, public speaking, management and budgeting procedures, and public relations.

Opportunities for promotion depend upon written examination results, job performance, interviews, and seniority. Increasingly, fire departments use assessment centers, which simulate a variety of actual job performance tasks, to screen for the best candidates for promotion. The line of promotion usually is to engineer, lieutenant, captain, battalion chief, assistant chief, deputy chief, and finally to chief. Many fire departments now require a bachelor's degree, preferably in fire science, public administration, or a related field, for promotion to positions higher than battalion chief. A master's degree is required for executive fire officer certification from the National Fire Academy and for State chief officer certification.

## Job Outlook

Prospective firefighters are expected to face keen competition for available job openings. Many people are attracted to firefighting because it is challenging and provides the opportunity to perform an essential public service, a high school education is usually sufficient for entry, and a pension is guaranteed upon retirement after 20 years. Consequently, the number of qualified applicants in most areas exceeds the number of job openings, even though the written examination and physical requirements eliminate many applicants. This situation is expected to persist in coming years.

Employment of firefighters is expected to grow about as fast as the average for all occupations through 2012 as fire departments continue to compete with other public safety providers for funding. Most job growth will occur as volunteer firefighting positions are converted to paid positions. In addition to job growth, openings are expected to result from the need to replace firefighters who retire, stop working for other reasons, or transfer to other occupations.

Layoffs of firefighters are uncommon. Fire protection is an essential service, and citizens are likely to exert considerable pressure on local officials to expand or at least preserve the level of fire protection. Even when budget cuts do occur, local fire departments usually cut expenses by postponing equipment purchases or not hiring new firefighters, rather than through staff reductions.

## Earnings

Median hourly earnings of firefighters were \$17.42 in 2002. The middle 50 percent earned between \$12.53 and \$22.96. The lowest 10 percent earned less than \$8.51, and the highest 10 percent earned more than \$28.22. Median hourly earnings were \$17.92 in local government, \$15.96 in the Federal Government, and \$13.58 in State government.

Median annual earnings of first-line supervisors/managers of firefighting and prevention workers were \$55,450 in 2002. The middle 50 percent earned between \$43,920 and \$68,480. The lowest 10 percent earned less than \$34,190, and the highest 10 percent earned more than \$84,730.

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First-line supervisors/managers of firefighting and prevention workers employed in local government earned about \$56,390 a year in 2002.

Median annual earnings of fire inspectors were \$44,250 in 2002. The middle 50 percent earned between \$33,880 and \$56,100 a year. The lowest 10 percent earned less than \$26,350, and the highest 10 percent earned more than \$69,060. Fire inspectors and investigators employed in local government earned about \$46,820 a year.

According to the International City-County Management Association, average salaries in 2002 for sworn full-time positions were as follows:

	Minimum annual base salary	Maximum annual base salary
Fire chief	\$64,134	\$82,225
Deputy chief	56,522	72,152
Assistant fire chief	55,645	69,036
Battalion chief	54,935	68,673
Fire captain	45,383	54,463
Fire lieutenant	41,800	49,404
Fire prevention/code inspector	40,387	51,531
Engineer	38,656	48,678

Firefighters who average more than a certain number of hours a week are required to be paid overtime. The hours threshold is determined by the department during the firefighter's work period, which ranges from 7 to 28 days. Firefighters often earn overtime for working extra shifts to maintain minimum staffing levels or for special emergencies.

Firefighters receive benefits that usually include medical and liability insurance, vacation and sick leave, and some paid holidays. Almost all fire departments provide protective clothing (helmets, boots, and coats) and breathing apparatus, and many also provide dress uniforms. Firefighters are generally covered by pension plans, often providing retirement at half pay after 25 years of service or if disabled in the line of duty.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Firefighting Occupations, on the Internet at <http://www.bls.gov/oco/ocos158.htm>.

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## Fitness Workers

### Significant Points

- Educational requirements for recreation workers range from a high school diploma to a graduate degree, whereas fitness workers usually need certification.
- Competition will remain keen for full-time career positions in recreation; however, job prospects for fitness workers will be more favorable.
- The recreation field offers many part-time and seasonal job opportunities.

### Nature of the Work

People spend much of their leisure time participating in a wide variety of organized recreational activities, such as aerobics, arts and crafts, the performing arts, camping, and sports. Recreation and fitness workers plan, organize, and direct these activities in local playgrounds and recreation areas, parks, community centers, health clubs, fitness centers, religious organizations, camps, theme parks, and tourist attractions. Increasingly, recreational and fitness workers also are found in workplaces, where they organize and direct leisure activities and athletic programs for employees of all ages.

Recreation workers hold a variety of positions at different levels of responsibility. *Recreation leaders*, who are responsible for a recreation program's daily operation, primarily organize and direct participants. They may lead and give instruction in dance, drama, crafts, games, and sports; schedule use of facilities; keep records of equipment use; and ensure that recreation facilities and equipment are used properly. Workers who provide instruction and coach groups in specialties such as art, music, drama, swimming, or tennis may be called *activity specialists*. *Recreation supervisors* oversee recreation leaders and plan, organize, and manage recreational activities to meet the needs of a variety of populations. These workers often serve as liaisons between the director of the park or recreation center and the recreation leaders. Recreation supervisors with more specialized responsibilities also may direct special activities or events or oversee a major activity, such as aquatics, gymnastics, or performing arts. *Directors of recreation and parks* develop and manage comprehensive recreation programs in parks, playgrounds, and other settings. Directors usually serve as technical advisors to State and local recreation and park commissions and may be responsible for recreation and park budgets. (Workers in a related occupation, *recreational therapists*, help individuals to recover from or adjust to illness, disability, or specific social problems; this occupation is described elsewhere in the *Handbook*.)

Camp counselors lead and instruct children and teenagers in outdoor-oriented forms of recreation, such as swimming, hiking, horseback riding, and camping. In addition, counselors provide campers with specialized instruction in subjects such as archery, boating, music, drama, gymnastics, tennis, and computers. In resident camps, counselors also provide guidance and supervise daily living and general socialization. Camp directors typically supervise camp counselors, plan camp activities or programs, and perform the various administrative functions of a camp.

Fitness workers instruct or coach groups or individuals in various exercise activities. Because gyms and health clubs offer a variety of exercise activities such as weightlifting, yoga, aerobics, and karate, fitness workers typically specialize in only a few areas. *Fitness trainers* help clients to assess their level of physical fitness and help them to set and reach fitness goals. They also demonstrate various exercises and help clients to improve their exercise techniques. They may

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keep records of their clients' exercise sessions in order to assess their progress towards physical fitness. *Personal trainers* work with clients on a one-on-one basis in either a gym or the client's home. *Aerobics instructors* conduct group exercise sessions that involve aerobic exercise, stretching, and muscle conditioning. Some fitness workers may perform the duties of both aerobics instructors and fitness trainers. *Fitness directors* oversee the operations of a health club or fitness center. Their work involves creating and maintaining programs that meet the needs of the club's members. (Workers in a related occupation— *athletes, coaches, umpires, and related workers*—participate in organized sports; this occupation is described elsewhere in the *Handbook*.)

## Working Conditions

Recreation and fitness workers may work in a variety of settings—for example, a health club, cruise ship, woodland recreational park, or playground in the center of a large urban community. Regardless of setting, most recreation workers spend much of their time outdoors and may work in a variety of weather conditions, whereas most fitness workers spend their time indoors at fitness centers and health clubs. Recreation and fitness directors and supervisors, however, typically spend most of their time in an office, planning programs and special events. Directors and supervisors generally engage in less physical activity than do lower level recreation and fitness workers. Nevertheless, recreation and fitness workers at all levels risk suffering injuries during physical activities.

Many recreation and fitness workers work about 40 hours a week. People entering this field, especially camp counselors, should expect some night and weekend work and irregular hours. About 36 percent work part time and many recreation jobs are seasonal.

## Employment

Recreation and fitness workers held about 485,000 jobs in 2002, and many additional workers held summer jobs in this occupation. About 62 percent were recreation workers; the rest were fitness trainers and aerobics instructors. Of those with year-round jobs as recreation workers, almost 40 percent worked for local governments, primarily in the park and recreation departments. Around 14 percent of recreation workers were employed in civic and social organizations, such as the Boy or Girl Scouts or Red Cross. Another 12 percent of recreation workers were employed by nursing and other personal care facilities.

Almost all fitness trainers and aerobics instructors worked in physical fitness facilities, health clubs, and fitness centers, mainly within the amusement and recreation services industry or civic and social organizations. About 5 percent of fitness workers were self-employed; many of these were personal trainers.

The recreation field has an unusually large number of part-time, seasonal, and volunteer jobs. These jobs include summer camp counselors, craft specialists, and afterschool and weekend recreation program leaders. In addition, many teachers and college students accept jobs as recreation and fitness workers when school is not in session. The vast majority of volunteers serve as activity leaders at local day-camp programs, or in youth organizations, camps, nursing homes, hospitals, senior centers, and other settings.

## Training, Other Qualifications, and Advancement

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Educational requirements for recreation workers range from a high school diploma—or sometimes less for many summer jobs—to graduate degrees for some administrative positions in large public recreation systems. Full-time career professional positions usually require a college degree with a major in parks and recreation or leisure studies, but a bachelor's degree in any liberal arts field may be sufficient for some jobs in the private sector. In industrial recreation, or "employee services" as it is more commonly called, companies prefer to hire those with a bachelor's degree in recreation or leisure studies and a background in business administration.

Specialized training or experience in a particular field, such as art, music, drama, or athletics, is an asset for many jobs. Some jobs also require certification. For example, a lifesaving certificate is a prerequisite for teaching or coaching water-related activities. Graduates of associate degree programs in parks and recreation, social work, and other human services disciplines also enter some career recreation positions. High school graduates occasionally enter career positions, but this is not common. Some college students work part time as recreation workers while earning degrees.

A bachelor's degree and experience are preferred for most recreation supervisor jobs and required for higher level administrative jobs. However, an increasing number of recreation workers who aspire to administrative positions obtain master's degrees in parks and recreation or related disciplines. Certification in the recreation field may be helpful for advancement. Also, many persons in other disciplines, including social work, forestry, and resource management, pursue graduate degrees in recreation.

Programs leading to an associate or bachelor's degree in parks and recreation, leisure studies, or related fields are offered at several hundred colleges and universities. Many also offer master's or doctoral degrees in the field. In 2002, 100 bachelor's degree programs in parks and recreation were accredited by the National Recreation and Park Association (NRPA). Accredited programs provide broad exposure to the history, theory, and practice of park and recreation management. Courses offered include community organization; supervision and administration; recreational needs of special populations, such as the elderly or disabled; and supervised fieldwork. Students may specialize in areas such as therapeutic recreation, park management, outdoor recreation, industrial or commercial recreation, or camp management. Certification in the recreation field is offered by the NRPA National Certification Board. Continuing education is necessary to remain certified.

Generally, fitness trainers and aerobics instructors must obtain a certification in the fitness field to obtain employment. Certification may be offered in various areas of exercise such as personal training, weight training, and aerobics. There are many organizations that offer certification testing in the fitness field, some of which are listed in the Sources of Additional Information section of this statement. Certification generally is good for 2 years, after which workers must become recertified. Recertification is accomplished by attending continuing education classes. Most fitness workers are required to maintain a cardiopulmonary resuscitation (CPR) certification. Some employers also require workers to be certified in first aid.

An increasing number of employers require fitness workers to have a bachelor's degree in a field related to health or fitness, such as exercise science or physical education. Some employers allow workers to substitute a college degree for certification, while others require both a degree and certification. A bachelor's degree and, in some cases, a master's degree in exercise science, physical education, or a related area, along with experience, usually is required to advance to management positions in a health club or fitness center. Many fitness workers become personal trainers, in addition to their main job in a fitness center, or as a full-time job. Some workers go into business for themselves and open up their own fitness centers.

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Persons planning recreation and fitness careers should be outgoing, good at motivating people, and sensitive to the needs of others. Excellent health and physical fitness are required due to the physical nature of the job. Volunteer experience, part-time work during school, or a summer job can lead to a full-time career as a recreation worker. As in many fields, managerial skills are needed to advance to supervisory or managerial positions. College courses in management, business administration, accounting, and personnel management are helpful for advancement to supervisory or managerial jobs.

## Job Outlook

Competition will be keen for career positions as recreation workers because the field attracts many applicants and because the number of career positions is limited compared with the number of lower level seasonal jobs. Opportunities for staff positions should be best for persons with formal training and experience gained in part-time or seasonal recreation jobs. Those with graduate degrees should have the best opportunities for supervisory or administrative positions. Opportunities are expected to be better for fitness trainers and aerobics instructors because of relatively rapid growth in employment. Job openings for both recreation and fitness workers also will stem from the need to replace the large numbers of workers who leave these occupations each year.

Overall employment of recreation and fitness workers is expected to grow faster than the average for all occupations through 2012, as an increasing number of people spend more time and money on recreation, fitness, and leisure services and as more businesses recognize the benefits of recreation and fitness programs and other services such as wellness programs. Average employment growth is projected for recreation workers—reflecting growth in local government and civic and social organizations, industries that employ just over half of all recreation workers. Employment growth among recreation workers may be inhibited, however, by budget constraints that some local governments may face over the 2002-12 projection period. Employment of fitness workers—who are concentrated in the rapidly growing arts, entertainment and recreation industry—is expected to increase much faster than average due to rising interest in personal training, aerobics instruction, and other fitness activities.

The recreation field provides a large number of temporary, seasonal jobs. These positions, which typically are filled by high school or college students, generally do not have formal education requirements and are open to anyone with the desired personal qualities. Employers compete for a share of the vacationing student labor force and, although salaries in recreation often are lower than those in other fields, the nature of the work and the opportunity to work outdoors are attractive to many.

## Earnings

Median hourly earnings of recreation workers who worked full time in 2002 were \$8.69. The middle 50 percent earned between about \$7.09 and \$11.36, while the top 10 percent earned \$15.72 or more. However, earnings of recreation directors and others in supervisory or managerial positions can be substantially higher. Most public and private recreation agencies provide full-time recreation workers with typical benefits; part-time workers receive few, if any, benefits. Median hourly earnings in the industries employing the largest numbers of recreation workers in 2002 were:

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Nursing care facilities	\$9.30
Local government	8.98
Individual and family services	8.71
Civic and social organizations	7.73
Other amusement and recreation industries	7.53

Median hourly earnings of fitness trainers and aerobics instructors in 2002 were \$11.51. The middle 50 percent earned between \$8.06 and \$18.18, while the top 10 percent earned \$26.22 or more. Earnings of successful self-employed personal trainers can be much higher. Median hourly earnings in the industries employing the largest numbers of recreation workers in 2002 were:

Other amusement and recreation industries	\$13.81
Civic and social organizations	9.24
Other schools and instruction	8.93

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Recreation and Fitness Workers, on the Internet at <http://www.bls.gov/oco/ocos058.htm>.

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## Heating, Air-Conditioning, and Refrigeration Mechanics and Installers

### Significant Points

- Job prospects for heating, air-conditioning, and refrigeration mechanics and installers are expected to be good, particularly for those with technical school or formal apprenticeship training.
- The Air-Conditioning Excellence program, offered through North American Technician Excellence, is the standard for certification of experienced technicians.

### Nature of the Work

What would those living in Chicago do without heating, those in Miami do without air-conditioning, or blood banks all over the country do without refrigeration? Heating and air-conditioning systems control the temperature, humidity, and the total air quality in residential, commercial, industrial, and other buildings. Refrigeration systems make it possible to store and transport food, medicine, and other perishable items. Heating, air-conditioning, and refrigeration mechanics and installers—also called technicians—install, maintain, and repair such systems. Because heating, ventilation, air-conditioning, and refrigeration systems often are referred to as HVACR systems, these workers also may be called HVACR technicians.

Heating, air-conditioning, and refrigeration systems consist of many mechanical, electrical, and electronic components, such as motors, compressors, pumps, fans, ducts, pipes, thermostats, and switches. In central heating systems, for example, a furnace heats air that is distributed throughout the building via a system of metal or fiberglass ducts. Technicians must be able to maintain, diagnose, and correct problems throughout the entire system. To do this, they adjust system controls to recommended settings and test the performance of the entire system using special tools and test equipment.

Technicians often specialize in either installation or maintenance and repair, although they are trained to do both. Some specialize in one type of equipment—for example, oil burners, solar panels, or commercial refrigerators. Technicians may work for large or small contracting companies or directly for a manufacturer or wholesaler. Those working for smaller operations tend to do both installation and servicing, and work with heating, cooling, and refrigeration equipment. Service contracts—which involve heating, air-conditioning, and refrigeration work for particular customers on a regular basis—are becoming more common. Service agreements help to reduce the seasonal fluctuations of this work.

Heating and air-conditioning mechanics install, service, and repair heating and air-conditioning systems in both residences and commercial establishments. *Furnace installers*, also called *heating equipment technicians*, follow blueprints or other specifications to install oil, gas, electric, solid-fuel, and multiple-fuel heating systems. *Air-conditioning mechanics* install and service central air-conditioning systems. After putting the equipment in place, they install fuel and water supply lines, air ducts and vents, pumps, and other components. They may connect electrical wiring and controls and check the unit for proper operation. To ensure the proper functioning of the system, furnace installers often use combustion test equipment, such as carbon dioxide and oxygen testers.

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After a furnace has been installed, heating equipment technicians often perform routine maintenance and repair work to keep the system operating efficiently. During the fall and winter, for example, when the system is used most, they service and adjust burners and blowers. If the system is not operating properly, they check the thermostat, burner nozzles, controls, or other parts to diagnose and then correct the problem.

During the summer, when the heating system is not being used, heating equipment technicians do maintenance work, such as replacing filters, ducts, and other parts of the system that may accumulate dust and impurities during the operating season. During the winter, air-conditioning mechanics inspect the systems and do required maintenance, such as overhauling compressors.

*Refrigeration mechanics* install, service, and repair industrial and commercial refrigerating systems and a variety of refrigeration equipment. They follow blueprints, design specifications, and manufacturers' instructions to install motors, compressors, condensing units, evaporators, piping, and other components. They connect this equipment to the ductwork, refrigerant lines, and electrical power source. After making the connections, they charge the system with refrigerant, check it for proper operation, and program control systems.

When heating, air-conditioning, and refrigeration mechanics service equipment, they must use care to conserve, recover, and recycle chlorofluorocarbon (CFC) and hydrochlorofluorocarbon (HCFC) refrigerants used in air-conditioning and refrigeration systems. The release of CFCs and HCFCs contributes to the depletion of the stratospheric ozone layer, which protects plant and animal life from ultraviolet radiation. Technicians conserve the refrigerant by making sure that there are no leaks in the system; they recover it by venting the refrigerant into proper cylinders; and they recycle it for reuse with special filter-dryers.

Heating, air-conditioning, and refrigeration mechanics and installers are adept at using a variety of tools, including hammers, wrenches, metal snips, electric drills, pipe cutters and benders, measurement gauges, and acetylene torches, to work with refrigerant lines and air ducts. They use voltmeters, thermometers, pressure gauges, manometers, and other testing devices to check airflow, refrigerant pressure, electrical circuits, burners, and other components.

Other craftworkers sometimes install or repair cooling and heating systems. For example, on a large air-conditioning installation job, especially where workers are covered by union contracts, ductwork might be done by sheet metal workers and duct installers; electrical work by electricians; and installation of piping, condensers, and other components by pipelayers, plumbers, pipefitters, and steamfitters. Home appliance repairers usually service room air-conditioners and household refrigerators. (Additional information about each of these occupations appears elsewhere in the *Handbook*.)

## Working Conditions

Heating, air-conditioning, and refrigeration mechanics and installers work in homes, stores of all kinds, hospitals, office buildings, and factories—anywhere there is climate-control equipment. They may be assigned to specific jobsites at the beginning of each day, or if they are making service calls, they may be dispatched to jobs by radio, telephone, or pager. Increasingly, employers are using cell phones to coordinate technicians' schedules.

Technicians may work outside in cold or hot weather or in buildings that are uncomfortable because the air-conditioning or heating equipment is broken. In addition, technicians might have

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to work in awkward or cramped positions and sometimes are required to work in high places. Hazards include electrical shock, burns, muscle strains, and other injuries from handling heavy equipment. Appropriate safety equipment is necessary when handling refrigerants because contact can cause skin damage, frostbite, or blindness. Inhalation of refrigerants when working in confined spaces also is a possible hazard.

The majority of mechanics and installers work at least a 40-hour week. During peak seasons they often work overtime or irregular hours. Maintenance workers, including those who provide maintenance services under contract, often work evening or weekend shifts and are on call. Most employers try to provide a full workweek year-round by scheduling both installation and maintenance work, and many manufacturers and contractors now provide or even require service contracts. In most shops that service both heating and air-conditioning equipment, employment is stable throughout the year.

Heating, air-conditioning, and refrigeration mechanics and installers held about 249,000 jobs in 2002; almost half worked for cooling and heating contractors. The remainder was employed in a variety of industries throughout the country, reflecting a widespread dependence on climate-control systems. Some worked for fuel oil dealers, refrigeration and air-conditioning service and repair shops, schools, and stores that sell heating and air-conditioning systems. Local governments, the Federal Government, hospitals, office buildings, and other organizations that operate large air-conditioning, refrigeration, or heating systems employed others. About 15 percent of mechanics and installers were self-employed.

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## Training, Other Qualifications, and Advancement

Because of the increasing sophistication of heating, air-conditioning, and refrigeration systems, employers prefer to hire those with technical school or apprenticeship training. Many mechanics and installers, however, still learn the trade informally on the job.

Many secondary and postsecondary technical and trade schools, junior and community colleges, and the U.S. Armed Forces offer 6-month to 2-year programs in heating, air-conditioning, and refrigeration. Students study theory, design, and equipment construction, as well as electronics. They also learn the basics of installation, maintenance, and repair.

Apprenticeship programs frequently are run by joint committees representing local chapters of the Air-Conditioning Contractors of America, the Mechanical Contractors Association of America, the National Association of Plumbing-Heating-Cooling Contractors, and locals of the Sheet Metal Workers' International Association or the United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada. Other apprenticeship

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programs are sponsored by local chapters of the Associated Builders and Contractors and the National Association of Home Builders. Formal apprenticeship programs normally last 3 to 5 years and combine on-the-job training with classroom instruction. Classes include subjects such as the use and care of tools, safety practices, blueprint reading, and the theory and design of heating, ventilation, air-conditioning, and refrigeration systems. Applicants for these programs must have a high school diploma or equivalent. Math and reading skills are essential.

Those who acquire their skills on the job usually begin by assisting experienced technicians. They may begin by performing simple tasks such as carrying materials, insulating refrigerant lines, or cleaning furnaces. In time, they move on to more difficult tasks, such as cutting and soldering pipes and sheet metal and checking electrical and electronic circuits.

Courses in shop math, mechanical drawing, applied physics and chemistry, electronics, blueprint reading, and computer applications provide a good background for those interested in entering this occupation. Some knowledge of plumbing or electrical work also is helpful. A basic understanding of electronics is becoming more important because of the increasing use of this technology in equipment controls. Because technicians frequently deal directly with the public, they should be courteous and tactful, especially when dealing with an aggravated customer. They also should be in good physical condition because they sometimes have to lift and move heavy equipment.

All technicians who purchase or work with refrigerants must be certified in their proper handling. To become certified to purchase and handle refrigerants, technicians must pass a written examination specific to the type of work in which they specialize. The three possible areas of certification are: Type I—servicing small appliances, Type II—high-pressure refrigerants, and Type III—low-pressure refrigerants. Exams are administered by organizations approved by the U.S. Environmental Protection Agency, such as trade schools, unions, contractor associations, or building groups.

Several organizations have begun to offer basic self-study, classroom, and Internet courses for individuals with limited experience. In addition to understanding how systems work, technicians must be knowledgeable about refrigerant products and the legislation and regulations that govern their use. The Air-Conditioning Excellence program, which is offered through North American Technician Excellence (NATE), generally has been adopted as the standard for certification of experienced technicians.

Advancement usually takes the form of higher wages. Some technicians, however, may advance to positions as supervisor or service manager. Others may move into areas such as sales and marketing. Still others may become building superintendents, cost estimators, or, with the necessary certification, teachers. Those with sufficient money and managerial skill can open their own contracting business.

## Job Outlook

Job prospects for heating, air-conditioning, and refrigeration mechanics and installers are expected to be good, particularly for those with technical school or formal apprenticeship training. Employment of heating, air-conditioning, and refrigeration mechanics and installers is expected to grow faster than the average for all occupations through the year 2012. As the population and economy grow, so does the demand for new residential, commercial, and industrial climate-control systems. Technicians who specialize in installation work may experience periods of unemployment when the level of new construction activity declines, but maintenance and repair

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work usually remains relatively stable. People and businesses depend on their climate-control systems and must keep them in good working order, regardless of economic conditions.

Renewed concern for energy conservation should continue to prompt the development of new energy-saving heating and air-conditioning systems. An emphasis on better energy management should lead to the replacement of older systems and the installation of newer, more efficient systems in existing homes and buildings. Also, demand for maintenance and service work should increase as businesses and homeowners strive to keep systems operating at peak efficiency. Regulations prohibiting the discharge of CFC and HCFC refrigerants took effect in 1993, and regulations banning CFC production became effective in 2000. Consequently, these regulations should continue to result in demand for technicians to replace many existing systems, or modify them to use new environmentally safe refrigerants. In addition, the continuing focus on improving indoor air quality should contribute to the creation of more jobs for heating, air-conditioning, and refrigeration technicians. Also, growth of business establishments that use refrigerated equipment—such as supermarkets and convenience stores—will contribute to a growing need for technicians. In addition to job openings created by employment growth, thousands of openings will result from the need to replace workers who transfer to other occupations or leave the labor force.

## Earnings

Median hourly earnings of heating, air-conditioning, and refrigeration mechanics and installers were \$16.78 in 2002. The middle 50 percent earned between \$12.95 and \$21.37 an hour. The lowest 10 percent earned less than \$10.34, and the top 10 percent earned more than \$26.20. Median hourly earnings in the industries employing the largest numbers of heating, air-conditioning, and refrigeration mechanics and installers in 2002 were as follows:

Hardware, and plumbing and heating equipment and supplies merchant wholesalers	\$18.78
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	17.16
Direct selling establishments	17.14
Elementary and secondary schools	16.80
Building equipment contractors	16.03

Apprentices usually begin at about 50 percent of the wage rate paid to experienced workers. As they gain experience and improve their skills, they receive periodic increases until they reach the wage rate of experienced workers.

Heating, air-conditioning, and refrigeration mechanics and installers enjoy a variety of employer-sponsored benefits. In addition to typical benefits such as health insurance and pension plans, some employers pay for work-related training and provide uniforms, company vans, and tools.

About 20 percent of heating, air-conditioning, and refrigeration mechanics and installers are members of a union. The unions to which the greatest numbers of mechanics and installers belong are the Sheet Metal Workers' International Association and the United Association of

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Journeyman and Apprentices of the Plumbing and Pipefitting Industry of the United States and Canada.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Heating, Air-Conditioning, and Refrigeration Mechanics and Installers, on the Internet at <http://www.bls.gov/oco/ocos192.htm>.

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## Licensed Practical and Licensed Vocational Nurses

### Significant Points

- Training lasting about 1 year is available in about 1,100 State-approved programs, mostly in vocational or technical schools.
- Nursing care facilities will offer the most new jobs.
- Applicants for jobs in hospitals may face competition as the number of hospital jobs for LPNs declines.

### Nature of the Work

Licensed practical nurses (LPNs), or licensed vocational nurses (LVNs), care for the sick, injured, convalescent, and disabled under the direction of physicians and registered nurses. (The work of *physicians and surgeons* and *registered nurses* is described elsewhere in the *Handbook*.)

Most LPNs provide basic bedside care, taking vital signs such as temperature, blood pressure, pulse, and respiration. They also prepare and give injections and enemas, monitor catheters, apply dressings, treat bedsores, and give alcohol rubs and massages. LPNs monitor their patients and report adverse reactions to medications or treatments. They collect samples for testing, perform routine laboratory tests, feed patients, and record food and fluid intake and output. To help keep patients comfortable, LPNs assist with bathing, dressing, and personal hygiene. In States where the law allows, they may administer prescribed medicines or start intravenous fluids. Some LPNs help deliver, care for, and feed infants. Experienced LPNs may supervise nursing assistants and aides.

In addition to providing routine bedside care, LPNs in nursing care facilities help evaluate residents' needs, develop care plans, and supervise the care provided by nursing aides. In doctors' offices and clinics, they also may make appointments, keep records, and perform other clerical duties. LPNs who work in private homes may prepare meals and teach family members simple nursing tasks.

### Working Conditions

Most licensed practical nurses in hospitals and nursing care facilities work a 40-hour week, but because patients need around-the-clock care, some work nights, weekends, and holidays. They often stand for long periods and help patients move in bed, stand, or walk.

LPNs may face hazards from caustic chemicals, radiation, and infectious diseases such as hepatitis. They are subject to back injuries when moving patients and shock from electrical equipment. They often must deal with the stress of heavy workloads. In addition, the patients they care for may be confused, irrational, agitated, or uncooperative.

### Employment

Licensed practical nurses held about 702,000 jobs in 2002. About 28 percent of LPNs worked in hospitals, 26 percent in nursing care facilities, and another 12 percent in offices of physicians. Others worked for home healthcare services, employment services, community care facilities for

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the elderly, public and private educational services, outpatient care centers, and Federal, State, and local government agencies; about 1 in 5 worked part time.

## Training, Other Qualifications, and Advancement

All States and the District of Columbia require LPNs to pass a licensing examination after completing a State-approved practical nursing program. A high school diploma or its equivalent usually is required for entry, although some programs accept candidates without a diploma or are designed as part of a high school curriculum.

In 2002, approximately 1,100 State-approved programs provided training in practical nursing. Almost 6 out of 10 students were enrolled in technical or vocational schools, while 3 out of 10 were in community and junior colleges. Others were in high schools, hospitals, and colleges and universities.

Most practical nursing programs last about 1 year and include both classroom study and supervised clinical practice (patient care). Classroom study covers basic nursing concepts and patient care-related subjects, including anatomy, physiology, medical-surgical nursing, pediatrics, obstetrics, psychiatric nursing, the administration of drugs, nutrition, and first aid. Clinical practice usually is in a hospital, but sometimes includes other settings.

LPNs should have a caring, sympathetic nature. They should be emotionally stable, because work with the sick and injured can be stressful. They also should have keen observational, decisionmaking, and communication skills. As part of a healthcare team, they must be able to follow orders and work under close supervision.

## Job Outlook

Employment of LPNs is expected to grow about as fast as the average for all occupations through 2012 in response to the long-term care needs of an increasing elderly population and the general growth of healthcare. Replacement needs will be a major source of job openings, as many workers leave the occupation permanently.

Applicants for jobs in hospitals may face competition as the number of hospital jobs for LPNs declines. An increasing proportion of sophisticated procedures, which once were performed only in hospitals, is being performed in physicians' offices and in outpatient care centers such as ambulatory surgical and emergency medical centers, due largely to advances in technology. Consequently, employment of LPNs is projected to grow faster than average in these sectors as healthcare expands outside the traditional hospital setting.

Employment of LPNs in nursing care facilities is expected to grow faster than the average. Such facilities will offer the most new jobs for LPNs as the number of aged and disabled persons in need of long-term care rises. In addition to caring for the aged and the disabled, LPNs in nursing care facilities will care for the increasing number of patients who will have been discharged from the hospital, but have not recovered enough to return home.

Employment of LPNs is expected to grow much faster than average in home healthcare services. This growth is in response to an increasing number of older persons with functional disabilities,

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consumer preference for care in the home, and technological advances that make it possible to bring increasingly complex treatments into the home.

## Earnings

Median annual earnings of licensed practical nurses were \$31,440 in 2002. The middle 50 percent earned between \$26,430 and \$37,050. The lowest 10 percent earned less than \$22,860, and the highest 10 percent earned more than \$44,040. Median annual earnings in the industries employing the largest numbers of licensed practical nurses in 2002 were as follows:

Employment services	\$40,550
Home health care services	32,850
Nursing care facilities	32,220
General medical and surgical hospitals	30,310
Offices of physicians	28,710

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Licensed Practical and Licensed Vocational Nurses, on the Internet at <http://www.bls.gov/oco/ocos102.htm>.

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## Medical Assistants

### Significant Points

- Some medical assistants are trained on the job, but many complete 1- or 2-year programs in vocational-technical high schools, postsecondary vocational schools, and community and junior colleges.
- Medical assistants is projected to be the fastest growing occupation over the 2002-12 period.
- Job prospects should be best for medical assistants with formal training or experience, particularly those with certification.

### Nature of the Work

Medical assistants perform routine administrative and clinical tasks to keep the offices of physicians, podiatrists, chiropractors, and other health practitioners running smoothly. They should not be confused with physician assistants, who examine, diagnose, and treat patients under the direct supervision of a physician. (Physician assistants are discussed elsewhere in the *Handbook*.)

The duties of medical assistants vary from office to office, depending on the location and size of the practice and the practitioner's specialty. In small practices, medical assistants usually are "generalists," handling both administrative and clinical duties and reporting directly to an office manager, physician, or other health practitioner. Those in large practices tend to specialize in a particular area, under the supervision of department administrators.

Medical assistants perform many administrative duties, including answering telephones, greeting patients, updating and filing patients' medical records, filling out insurance forms, handling correspondence, scheduling appointments, arranging for hospital admission and laboratory services, and handling billing and bookkeeping.

Clinical duties vary according to State law and include taking medical histories and recording vital signs, explaining treatment procedures to patients, preparing patients for examination, and assisting the physician during the examination. Medical assistants collect and prepare laboratory specimens or perform basic laboratory tests on the premises, dispose of contaminated supplies, and sterilize medical instruments. They instruct patients about medications and special diets, prepare and administer medications as directed by a physician, authorize drug refills as directed, telephone prescriptions to a pharmacy, draw blood, prepare patients for x rays, take electrocardiograms, remove sutures, and change dressings.

Medical assistants also may arrange examining-room instruments and equipment, purchase and maintain supplies and equipment, and keep waiting and examining rooms neat and clean.

Assistants who specialize have additional duties. *Podiatric medical assistants* make castings of feet, expose and develop x rays, and assist podiatrists in surgery. *Ophthalmic medical assistants* help ophthalmologists provide eye care. They conduct diagnostic tests, measure and record vision, and test eye muscle function. They also show patients how to insert, remove, and care for contact lenses, and they apply eye dressings. Under the direction of the physician, ophthalmic

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medical assistants may administer eye medications. They also maintain optical and surgical instruments and may assist the ophthalmologist in surgery.

## Working Conditions

Medical assistants work in well-lighted, clean environments. They constantly interact with other people and may have to handle several responsibilities at once.

Most full-time medical assistants work a regular 40-hour week. Some work part time, evenings, or weekends.

## Employment

Medical assistants held about 365,000 jobs in 2002. Almost 60 percent worked in offices of physicians; about 14 percent worked in public and private hospitals, including inpatient and outpatient facilities; and almost 10 percent worked in offices of other health practitioners, such as chiropractors and podiatrists. The rest worked mostly in outpatient care centers, public and private educational services, other ambulatory healthcare services, State and local government agencies, medical and diagnostic laboratories, nursing care facilities, and employment services.

## Training, Other Qualifications, and Advancement

Most employers prefer graduates of formal programs in medical assisting. Such programs are offered in vocational-technical high schools, postsecondary vocational schools, and community and junior colleges. Postsecondary programs usually last either 1 year, resulting in a certificate or diploma, or 2 years, resulting in an associate degree. Courses cover anatomy, physiology, and medical terminology, as well as typing, transcription, recordkeeping, accounting, and insurance processing. Students learn laboratory techniques, clinical and diagnostic procedures, pharmaceutical principles, the administration of medications, and first aid. They study office practices, patient relations, medical law, and ethics. Accredited programs include an internship that provides practical experience in physicians' offices, hospitals, or other healthcare facilities.

Two agencies recognized by the U.S. Department of Education accredit programs in medical assisting: The Commission on Accreditation of Allied Health Education Programs (CAAHEP) and the Accrediting Bureau of Health Education Schools (ABHES). In 2002, there were 495 medical assisting programs accredited by CAAHEP and about 170 accredited by ABHES. The Committee on Accreditation for Ophthalmic Medical Personnel approved 14 programs in ophthalmic medical assisting.

Formal training in medical assisting, while generally preferred, is not always required. Some medical assistants are trained on the job, although this practice is less common than in the past. Applicants usually need a high school diploma or the equivalent. Recommended high school courses include mathematics, health, biology, typing, bookkeeping, computers, and office skills. Volunteer experience in the healthcare field also is helpful.

Although medical assistants are not licensed, some States require them to take a test or a course before they can perform certain tasks, such as taking x rays. Employers prefer to hire experienced workers or certified applicants who have passed a national examination, indicating that the medical assistant meets certain standards of competence. The American Association of

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Medical Assistants awards the Certified Medical Assistant credential; the American Medical Technologists awards the Registered Medical Assistant credential; the American Society of Podiatric Medical Assistants awards the Podiatric Medical Assistant Certified credential; and the Joint Commission on Allied Health Personnel in Ophthalmology awards credentials at three levels: Certified Ophthalmic Assistant, Certified Ophthalmic Technician, and Certified Ophthalmic Medical Technologist.

Medical assistants deal with the public; therefore, they must be neat and well groomed and have a courteous, pleasant manner. Medical assistants must be able to put patients at ease and explain physicians' instructions. They must respect the confidential nature of medical information. Clinical duties require a reasonable level of manual dexterity and visual acuity.

Medical assistants may be able to advance to office manager. They may qualify for a variety of administrative support occupations or may teach medical assisting. With additional education, some enter other health occupations, such as nursing and medical technology.

## Job Outlook

Employment of medical assistants is expected to grow much faster than the average for all occupations through the year 2012 as the health services industry expands because of technological advances in medicine, and a growing and aging population. Increasing utilization of medical assistants in the rapidly-growing healthcare industries will result in fast employment growth for the occupation. In fact, medical assistants is projected to be the fastest growing occupation over the 2002–12 period.

Employment growth will be driven by the increase in the number of group practices, clinics, and other healthcare facilities that need a high proportion of support personnel, particularly the flexible medical assistant who can handle both administrative and clinical duties. Medical assistants work primarily in outpatient settings, which are expected to exhibit much faster-than-average growth.

In view of the preference of many healthcare employers for trained personnel, job prospects should be best for medical assistants with formal training or experience, and particularly for those with certification.

## Earnings

The earnings of medical assistants vary, depending on their experience, skill level, and location. Median annual earnings of medical assistants were \$23,940 in 2002. The middle 50 percent earned between \$20,260 and \$28,410. The lowest 10 percent earned less than \$17,640, and the highest 10 percent earned more than \$34,130. Median annual earnings in the industries employing the largest numbers of medical assistants in 2002 were as follows:

General medical and surgical hospitals	\$24,460
Offices of physicians	24,260
Outpatient care centers	23,980
Other ambulatory health care services	23,440
Offices of other health practitioners	21,620

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Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Medical Assistants, on the Internet at <http://www.bls.gov/oco/ocos164.htm>.

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## Medical Records and Health Information Technicians

### Significant Points

- This is one of the few health occupations in which there is little or no direct contact with patients.
- Medical records and health information technicians entering the field usually have an associate degree; courses include anatomy, physiology, medical terminology, and computer science.
- Job prospects should be very good, particularly in offices of physicians.

### Nature of the Work

Every time a patient receives healthcare, a record is maintained of the observations, medical or surgical interventions, and treatment outcomes. This record includes information that the patient provides concerning his or her symptoms and medical history, the results of examinations, reports of x rays and laboratory tests, diagnoses, and treatment plans. Medical records and health information technicians organize and evaluate these records for completeness and accuracy.

Technicians begin to assemble patients' health information by first making sure their initial medical charts are complete. They ensure that all forms are completed and properly identified and signed, and that all necessary information is in the computer. They regularly communicate with physicians or other healthcare professionals to clarify diagnoses or to obtain additional information.

Medical records and health information technicians assign a code to each diagnosis and procedure. They consult classification manuals and also rely on their knowledge of disease processes. Technicians then use computer software to assign the patient to one of several hundred "diagnosis-related groups," or DRGs. The DRG determines the amount for which the hospital will be reimbursed if the patient is covered by Medicare or other insurance programs using the DRG system. Technicians who specialize in coding are called health information coders, medical record coders, coder/abstractors, or coding specialists. In addition to the DRG system, coders use other coding systems, such as those geared towards ambulatory settings or long-term care.

Technicians also use computer programs to tabulate and analyze data to help improve patient care, to control costs, for use in legal actions, in response to surveys, or for use in research studies. Cancer registrars compile, maintain, and review records of cancer patients to provide information to physicians and for use in research studies.

Medical records and health information technicians' duties vary with the size of the facility. In large to medium-sized facilities, technicians may specialize in one aspect of health information, or supervise health information clerks and transcriptionists while a medical records and health information administrator manages the department. (See the statement on medical and health services managers elsewhere in the *Handbook*.) In small facilities, a credentialed medical records and health information technician sometimes manages the department.

### Working Conditions

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Medical records and health information technicians usually work a 40-hour week. Some overtime may be required. In hospitals—where health information departments often are open 24 hours a day, 7 days a week—technicians may work day, evening, and night shifts.

Medical records and health information technicians work in pleasant and comfortable offices. This is one of the few health occupations in which there is little or no direct contact with patients. Because accuracy is essential in their jobs, technicians must pay close attention to detail. Technicians who work at computer monitors for prolonged periods must guard against eyestrain and muscle pain.

## Employment

Medical records and health information technicians held about 147,000 jobs in 2002. Thirty-seven percent of all jobs were in hospitals. The rest were mostly in offices of physicians, nursing care facilities, outpatient care centers, and home healthcare services. Insurance firms that deal in health matters employ a small number of health information technicians to tabulate and analyze health information. Public health departments also hire technicians to supervise data collection from healthcare institutions and to assist in research.

## Training, Other Qualifications, and Advancement

Medical records and health information technicians entering the field usually have an associate degree from a community or junior college. In addition to general education, coursework includes medical terminology, anatomy and physiology, legal aspects of health information, coding and abstraction of data, statistics, database management, quality improvement methods, and computer science. Applicants can improve their chances of admission into a program by taking biology, chemistry, health, and computer science courses in high school.

Hospitals sometimes advance promising health information clerks to jobs as medical records and health information technicians, although this practice may be less common in the future. Advancement usually requires 2 to 4 years of job experience and completion of a hospital's in-house training program.

Most employers prefer to hire Registered Health Information Technicians (RHIT), who must pass a written examination offered by the American Health Information Management Association (AHIMA). To take the examination, a person must graduate from a 2-year associate degree program accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) of the American Medical Association. Technicians trained in non-CAAHEP-accredited programs, or on the job, are not eligible to take the examination. In 2003, CAAHEP accredited 182 programs for health information technicians. Technicians who specialize in coding may obtain voluntary certification.

Experienced medical records and health information technicians usually advance in one of two ways—by specializing or managing. Many senior technicians specialize in coding, particularly Medicare coding, or in cancer registry.

In large medical records and health information departments, experienced technicians may advance to section supervisor, overseeing the work of the coding, correspondence, or discharge sections, for example. Senior technicians with RHIT credentials may become director or assistant director of a medical records and health information department in a small facility. However, in

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larger institutions, the director is usually an administrator, with a bachelor's degree in medical records and health information administration.

## Job Outlook

Job prospects should be very good. Employment of medical records and health information technicians is expected to grow much faster than the average for all occupations through 2012, due to rapid growth in the number of medical tests, treatments, and procedures that will be increasingly scrutinized by third-party payers, regulators, courts, and consumers.

Although employment growth in hospitals will not keep pace with growth in other healthcare industries, many new jobs will nevertheless be created. The fastest employment growth and a majority of the new jobs are expected in offices of physicians, due to increasing demand for detailed records, especially in large group practices. Rapid growth also is expected in nursing care facilities, home healthcare services, and outpatient care centers. Additional job openings will result from the need to replace technicians who retire or leave the occupation permanently.

## Earnings

Median annual earnings of medical records and health information technicians were \$23,890 in 2002. The middle 50 percent earned between \$19,550 and \$30,600. The lowest 10 percent earned less than \$16,460, and the highest 10 percent earned more than \$38,640. Median annual earnings in the industries employing the largest numbers of medical records and health information technicians in 2002 were as follows:

Nursing care facilities	\$25,160
General medical and surgical hospitals	24,910
Outpatient care centers	22,380
Offices of physicians	21,320

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Medical Records and Health Information Technicians, on the Internet at <http://www.bls.gov/oco/ocos103.htm>.

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## Paralegals and Legal Assistants

### Significant Points

- While some paralegals train on the job, employers increasingly prefer graduates of postsecondary paralegal education programs; college graduates who have taken some paralegal courses are especially in demand in some markets.
- Paralegals are projected to grow faster than average, as law offices try to reduce costs by assigning them tasks formerly carried out by lawyers.
- Paralegals are employed by law firms, corporate legal departments, and various government offices and they may specialize in many different areas of the law.

### Nature of the Work

While lawyers assume ultimate responsibility for legal work, they often delegate many of their tasks to paralegals. In fact, paralegals—also called legal assistants—continue to assume a growing range of tasks in the Nation’s legal offices and perform many of the same tasks as lawyers. Nevertheless, they are still explicitly prohibited from carrying out duties which are considered to be the practice of law, such as setting legal fees, giving legal advice, and presenting cases in court.

One of a paralegal’s most important tasks is helping lawyers prepare for closings, hearings, trials, and corporate meetings. Paralegals investigate the facts of cases and ensure that all relevant information is considered. They also identify appropriate laws, judicial decisions, legal articles, and other materials that are relevant to assigned cases. After they analyze and organize the information, paralegals may prepare written reports that attorneys use in determining how cases should be handled. Should attorneys decide to file lawsuits on behalf of clients, paralegals may help prepare the legal arguments, draft pleadings and motions to be filed with the court, obtain affidavits, and assist attorneys during trials. Paralegals also organize and track files of all important case documents and make them available and easily accessible to attorneys.

In addition to this preparatory work, paralegals also perform a number of other vital functions. For example, they help draft contracts, mortgages, separation agreements, and trust instruments. They also may assist in preparing tax returns and planning estates. Some paralegals coordinate the activities of other law office employees and maintain financial office records. Various additional tasks may differ, depending on the employer.

Paralegals are found in all types of organizations, but most are employed by law firms, corporate legal departments, and various government offices. In these organizations, they can work in many different areas of the law, including litigation, personal injury, corporate law, criminal law, employee benefits, intellectual property, labor law, bankruptcy, immigration, family law, and real estate. As the law has become more complex, paralegals have responded by becoming more specialized. Within specialties, functions often are broken down further so that paralegals may deal with a specific area. For example, paralegals specializing in labor law may deal exclusively with employee benefits.

The duties of paralegals also differ widely based on the type of organization in which they are employed. Paralegals who work for corporations often assist attorneys with employee contracts, shareholder agreements, stock-option plans, and employee benefit plans. They also may help prepare and file annual financial reports, maintain corporate minute books and record resolutions,

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and prepare forms to secure loans for the corporation. Paralegals often monitor and review government regulations to ensure that the corporation is aware of new requirements and it operates within the law.

The duties of paralegals who work in the public sector usually vary within each agency. In general, they analyze legal material for internal use, maintain reference files, conduct research for attorneys, and collect and analyze evidence for agency hearings. They may then prepare informative or explanatory material on laws, agency regulations, and agency policy for general use by the agency and the public. Paralegals employed in community legal-service projects help the poor, the aged, and others in need of legal assistance. They file forms, conduct research, prepare documents, and when authorized by law, may represent clients at administrative hearings.

Paralegals in small and medium-sized law firms usually perform a variety of duties that require a general knowledge of the law. For example, they may research judicial decisions on improper police arrests or help prepare a mortgage contract. Paralegals employed by large law firms, government agencies, and corporations, however, are more likely to specialize in one aspect of the law.

Computer use and technical knowledge has become essential to paralegal work. Computer software packages and the Internet are increasingly used to search legal literature stored in computer databases and on CD-ROM. In litigation involving many supporting documents, paralegals may use computer databases to retrieve, organize, and index various materials. Imaging software allows paralegals to scan documents directly into a database, while billing programs help them to track hours billed to clients. Computer software packages also may be used to perform tax computations and explore the consequences of possible tax strategies for clients.

Paralegals employed by corporations and government usually work a standard 40-hour week. Although most paralegals work year round, some are temporarily employed during busy times of the year, then released when the workload diminishes. Paralegals who work for law firms sometimes work very long hours when they are under pressure to meet deadlines. Some law firms reward such loyalty with bonuses and additional time off.

These workers handle many routine assignments, particularly when they are inexperienced. As they gain experience, paralegals usually assume more varied tasks with additional responsibility. Paralegals do most of their work at desks in offices and law libraries. Occasionally, they travel to gather information and perform other duties.

## Working Conditions

Paralegals employed by corporations and government usually work a standard 40-hour week. Although most paralegals work year round, some are temporarily employed during busy times of the year, then released when the workload diminishes. Paralegals who work for law firms sometimes work very long hours when they are under pressure to meet deadlines. Some law firms reward such loyalty with bonuses and additional time off.

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Paralegals do most of their work at desks in offices and law libraries. Occasionally, they travel to gather information and perform other duties.

## Employment

Paralegals and legal assistants held about 200,000 jobs in 2002. Private law firms employed 7 out of 10 paralegals and legal assistants; most of the remainder worked for corporate legal departments and various levels of government. Within the Federal Government, the U.S. Department of Justice is the largest employer, followed by the Social Security Administration and the U.S. Department of Treasury. A small number of paralegals own their own businesses and work as freelance legal assistants, contracting their services to attorneys or corporate legal departments.

## Training, Other Qualifications, and Advancement

There are several ways to become a paralegal. The most common is through a community college paralegal program that leads to an associate's degree. The other common method of entry, mainly for those who have a college degree, is through a certification program that leads to a certification in paralegal studies. A small number of schools also offer bachelor's and master's degrees in paralegal studies. Some employers train paralegals on the job, hiring college graduates with no legal experience or promoting experienced legal secretaries. Other entrants have experience in a technical field that is useful to law firms, such as a background in tax preparation for tax and estate practice, criminal justice, or nursing or health administration for personal injury practice.

Formal paralegal training programs are offered by an estimated 600 colleges and universities, law schools, and proprietary schools. Approximately 250 paralegal programs are approved by the American Bar Association (ABA). Although this approval is neither required nor sought by many programs, graduation from an ABA-approved program can enhance one's employment opportunities. The requirements for admission to these programs vary. Some require certain college courses or a bachelor's degree; others accept high school graduates or those with legal experience; and a few schools require standardized tests and personal interviews.

Paralegal programs include 2-year associate's degree programs, 4-year bachelor's degree programs, and certificate programs that can take only a few months to complete. Most certificate programs provide intensive paralegal training for individuals who already hold college degrees, while associate's and bachelor's degree programs usually combine paralegal training with courses in other academic subjects. The quality of paralegal training programs varies; the better programs usually include job placement. Programs increasingly include courses introducing students to the legal applications of computers, including how to perform legal research using the Internet. Many paralegal training programs include an internship in which students gain practical experience by working for several months in a private law firm, office of a public defender or attorney general, bank, corporate legal department, legal-aid organization, or government agency. Experience gained in internships is an asset when seeking a job after graduation. Prospective students should examine the experiences of recent graduates before enrolling in those programs.

Although most employers do not require certification, earning a voluntary certificate from a professional society may offer advantages in the labor market. The National Association of Legal Assistants, for example, has established standards for certification requiring various combinations of education and experience. Paralegals who meet these standards are eligible to take a 2-day

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examination, given three times each year at several regional testing centers. Those who pass this examination may use the designation Certified Legal Assistant (CLA). In addition, the Paralegal Advanced Competency Exam, established in 1996 and administered through the National Federation of Paralegal Associations, offers professional recognition to paralegals with a bachelor's degree and at least 2 years of experience. Those who pass this examination may use the designation Registered Paralegal (RP).

Paralegals must be able to document and present their findings and opinions to their supervising attorney. They need to understand legal terminology and have good research and investigative skills. Familiarity with the operation and applications of computers in legal research and litigation support also is increasingly important. Paralegals should stay informed of new developments in the laws that affect their area of practice. Participation in continuing legal education seminars allows paralegals to maintain and expand their legal knowledge.

Because paralegals frequently deal with the public, they should be courteous and uphold the ethical standards of the legal profession. The National Association of Legal Assistants, the National Federation of Paralegal Associations, and a few States have established ethical guidelines for paralegals to follow.

Paralegals usually are given more responsibilities and less supervision as they gain work experience. Experienced paralegals who work in large law firms, corporate legal departments, and government agencies may supervise and delegate assignments to other paralegals and clerical staff. Advancement opportunities also include promotion to managerial and other law-related positions within the firm or corporate legal department. However, some paralegals find it easier to move to another law firm when seeking increased responsibility or advancement.

## Job Outlook

Paralegals and legal assistants are projected to grow faster than the average for all occupations through 2012. Some employment growth stems from law firms and other employers with legal staffs increasingly hiring paralegals to lower the cost and increase the availability and efficiency of legal services. The majority of job openings for paralegals in the future will be new jobs created by employment growth, but additional job openings will arise as people leave the occupation. Despite projections of fast employment growth, competition for jobs should continue as many people seek to go into this profession; however, highly skilled, formally trained paralegals have excellent employment potential.

Private law firms will continue to be the largest employers of paralegals, but a growing array of other organizations, such as corporate legal departments, insurance companies, real estate and title insurance firms, and banks hire paralegals. Corporations, in particular, are boosting their in-house legal departments to cut costs. Demand for paralegals also is expected to grow as an increasing population requires legal services, especially in areas such as intellectual property, healthcare, international, elder issues, criminal, and environmental law. The growth of prepaid legal plans also should contribute to the demand for legal services. Paralegal employment is expected to increase as organizations presently employing paralegals assign them a growing range of tasks, and as paralegals are increasingly employed in small and medium-sized establishments. A growing number of experienced paralegals are expected to establish their own businesses.

Job opportunities for paralegals will expand in the public sector as well. Community legal-service programs, which provide assistance to the poor, aged, minorities, and middle-income families, will

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employ additional paralegals to minimize expenses and serve the most people. Federal, State, and local government agencies, consumer organizations, and the courts also should continue to hire paralegals in increasing numbers.

To a limited extent, paralegal jobs are affected by the business cycle. During recessions, demand declines for some discretionary legal services, such as planning estates, drafting wills, and handling real estate transactions. Corporations are less inclined to initiate certain types of litigation when falling sales and profits lead to fiscal belt tightening. As a result, full-time paralegals employed in offices adversely affected by a recession may be laid off or have their work hours reduced. On the other hand, during recessions, corporations and individuals are more likely to face other problems that require legal assistance, such as bankruptcies, foreclosures, and divorces. Paralegals, who provide many of the same legal services as lawyers at a lower cost, tend to fare relatively better in difficult economic conditions.

## Earnings

Earnings of paralegals and legal assistants vary greatly. Salaries depend on education, training, experience, type and size of employer, and geographic location of the job. In general, paralegals who work for large law firms or in large metropolitan areas earn more than those who work for smaller firms or in less populated regions. In addition to a salary, many paralegals receive bonuses. In 2002, full-time, wage and salary paralegals and legal assistants had median annual earnings, including bonuses of \$37,950. The middle 50 percent earned between \$30,020 and \$48,760. The top 10 percent earned more than \$61,150, while the bottom 10 percent earned less than \$24,470. Median annual earnings in the industries employing the largest numbers of paralegals in 2002 were as follows:

Federal government	\$53,770
Legal services	36,780
Local government	36,030
State government	34,750

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Paralegals and Legal Assistants, on the Internet at <http://www.bls.gov/oco/ocos114.htm>.

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## Pharmacy Technicians

### Significant Points

Job opportunities are expected to be good, especially for those with certification or previous work experience.

- Many technicians work evenings, weekends, and holidays.
- Two-thirds of all jobs are in retail pharmacies.

### Nature of the Work

Pharmacy technicians help licensed pharmacists provide medication and other healthcare products to patients. Technicians usually perform routine tasks to help prepare prescribed medication for patients, such as counting tablets and labeling bottles. Technicians refer any questions regarding prescriptions, drug information, or health matters to a *pharmacist*. (See the statement on pharmacists elsewhere in the *Handbook*.)

*Pharmacy aides* work closely with pharmacy technicians. They are often clerks or cashiers who primarily answer telephones, handle money, stock shelves, and perform other clerical duties. (See the statement on pharmacy aides elsewhere in the *Handbook*.) Pharmacy technicians usually perform more complex tasks than do pharmacy aides, although, in some States, their duties and job titles overlap.

Pharmacy technicians who work in retail or mail-order pharmacies have varying responsibilities, depending on State rules and regulations. Technicians receive written prescriptions or requests for prescription refills from patients. They also may receive prescriptions sent electronically from the doctor's office. They must verify that the information on the prescription is complete and accurate. To prepare the prescription, technicians must retrieve, count, pour, weigh, measure, and sometimes mix the medication. Then, they prepare the prescription labels, select the type of prescription container, and affix the prescription and auxiliary labels to the container. Once the prescription is filled, technicians price and file the prescription, which must be checked by a pharmacist before it is given to a patient. Technicians may establish and maintain patient profiles, prepare insurance claim forms, and stock and take inventory of prescription and over-the-counter medications.

In hospitals, nursing homes, and assisted-living facilities, technicians have added responsibilities. They read patient charts and prepare and deliver the medicine to patients. The pharmacist must check the order before it is delivered to the patient. The technician then copies the information about the prescribed medication onto the patient's profile. Technicians also may assemble a 24-hour supply of medicine for every patient. They package and label each dose separately. The package is then placed in the medicine cabinet of each patient until the supervising pharmacist checks it for accuracy. It is then given to the patient.

### Working Conditions

Pharmacy technicians work in clean, organized, well-lighted, and well-ventilated areas. Most of their workday is spent on their feet. They may be required to lift heavy boxes or to use stepladders to retrieve supplies from high shelves.

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Technicians work the same hours that pharmacists work. These may include evenings, nights, weekends, and holidays. Because some hospital and retail pharmacies are open 24 hours a day, technicians may work varying shifts. As their seniority increases, technicians often have increased control over the hours they work. There are many opportunities for part-time work in both retail and hospital settings.

## Employment

Pharmacy technicians held about 211,000 jobs in 2002. Two-thirds of all jobs were in retail pharmacies, either independently owned or part of a drugstore chain, grocery store, department store, or mass retailer. About 22 percent of jobs were in hospitals and a small proportion was in mail-order and Internet pharmacies, clinics, pharmaceutical wholesalers, and the Federal Government.

## Training, Other Qualifications, and Advancement

Although most pharmacy technicians receive informal on-the-job training, employers favor those who have completed formal training and certification. However, there are currently few State and no Federal requirements for formal training or certification of pharmacy technicians. Employers who have neither the time nor money to give on-the-job training often seek formally educated pharmacy technicians. Formal education programs and certification emphasize the technician's interest in and dedication to the work. In addition to the military, some hospitals, proprietary schools, vocational or technical colleges, and community colleges offer formal education programs.

Formal pharmacy technician education programs require classroom and laboratory work in a variety of areas, including medical and pharmaceutical terminology, pharmaceutical calculations, pharmacy recordkeeping, pharmaceutical techniques, and pharmacy law and ethics. Technicians also are required to learn medication names, actions, uses, and doses. Many training programs include internships, in which students gain hands-on experience in actual pharmacies. Students receive a diploma, a certificate, or an associate degree, depending on the program.

Prospective pharmacy technicians with experience working as an aide in a community pharmacy or volunteering in a hospital may have an advantage. Employers also prefer applicants with strong customer service and communication skills and with experience managing inventories, counting, measuring, and using computers. Technicians entering the field need strong mathematics, spelling, and reading skills. A background in chemistry, English, and health education also may be beneficial. Some technicians are hired without formal training, but under the condition that they obtain certification within a specified period to retain employment.

The Pharmacy Technician Certification Board administers the National Pharmacy Technician Certification Examination. This exam is voluntary in most States and displays the competency of the individual to act as a pharmacy technician. However, more States and employers are requiring certification as reliance on pharmacy technicians grows. Eligible candidates must have a high school diploma or GED and no felony convictions, and those who pass the exam earn the title of Certified Pharmacy Technician (CPhT). The exam is offered several times per year at various locations nationally. Employers, often pharmacists, know that individuals who pass the exam have a standardized body of knowledge and skills. Many employers will also reimburse the costs of the exam as an incentive for certification.

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Certified technicians must be recertified every 2 years. Technicians must complete 20 contact hours of pharmacy-related topics within the 2-year certification period to become eligible for recertification. Contact hours are awarded for on-the-job training, attending lectures, and college coursework. At least 1 contact hour must be in pharmacy law. Contact hours can be earned from several different sources, including pharmacy associations, pharmacy colleges, and pharmacy technician training programs. Up to 10 contact hours can be earned when the technician is employed under the direct supervision and instruction of a pharmacist.

Successful pharmacy technicians are alert, observant, organized, dedicated, and responsible. They should be willing and able to take directions. They must enjoy precise work—details are sometimes a matter of life and death. Although a pharmacist must check and approve all their work, they should be able to work on their own without constant instruction from the pharmacist. Candidates interested in becoming pharmacy technicians cannot have prior records of drug or substance abuse.

Strong interpersonal and communication skills are needed because there is a lot of interaction with patients, coworkers, and healthcare professionals. Teamwork is very important because technicians are often required to work with pharmacists, aides, and other technicians.

## Job Outlook

Good job opportunities are expected for full-time and part-time work, especially for technicians with formal training or previous experience. Job openings for pharmacy technicians will result from the expansion of retail pharmacies and other employment settings, and from the need to replace workers who transfer to other occupations or leave the labor force.

Employment of pharmacy technicians is expected to grow faster than the average for all occupations through 2012 due to the increased pharmaceutical needs of a larger and older population, and to the greater use of medication. The increased number of middle-aged and elderly people—who, on average, use more prescription drugs than do younger people—will spur demand for technicians in all practice settings. With advances in science, more medications are becoming available to treat more conditions.

Cost-conscious insurers, pharmacies, and health systems will continue to emphasize the role of technicians. As a result, pharmacy technicians will assume responsibility for more routine tasks previously performed by pharmacists. Pharmacy technicians also will need to learn and master new pharmacy technology as it surfaces. For example, robotic machines are used to dispense medicine into containers; technicians must oversee the machines, stock the bins, and label the containers. Thus, while automation is increasingly incorporated into the job, it will not necessarily reduce the need for technicians.

Almost all States have legislated the maximum number of technicians who can safely work under a pharmacist at one time. In some States, technicians have assumed more medication dispensing duties as pharmacists have become more involved in patient care, resulting in more technicians per pharmacist. Changes in these laws could directly affect employment.

## Earnings

Median hourly earnings of wage and salary pharmacy technicians in 2002 were \$10.70. The middle 50 percent earned between \$8.74 and \$13.19; the lowest 10 percent earned less than

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\$7.44, and the highest 10 percent earned more than \$15.82. Median hourly earnings in the industries employing the largest numbers of pharmacy technicians in 2002 were as follows:

General medical and surgical hospitals	\$12.32
Grocery stores	11.34
Drugs and druggists' sundries merchant wholesalers	10.60
Health and personal care stores	9.70
Department stores	9.69

Certified technicians may earn more. Shift differentials for working evenings or weekends also can increase earnings. Some technicians belong to unions representing hospital or grocery store workers.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Pharmacy Technicians, on the Internet at <http://www.bls.gov/oco/ocos252.htm>.

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## Police and Sheriff's Patrol Officers

### Significant Points

- Police work can be dangerous and stressful.
- Civil service regulations govern the appointment of police and detectives.
- Competition should remain keen for higher paying jobs with State and Federal agencies and police departments in affluent areas; opportunities will be better in local and special police departments that offer relatively low salaries or in urban communities where the crime rate is relatively high.
- Applicants with college training in police science or military police experience should have the best opportunities.

### Nature of the Work

People depend on police officers and detectives to protect their lives and property. Law enforcement officers, some of whom are State or Federal special agents or inspectors, perform these duties in a variety of ways, depending on the size and type of their organization. In most jurisdictions, they are expected to exercise authority when necessary, whether on or off duty.

*Uniformed police officers* who work in municipal police departments of various sizes, small communities, and rural areas have general law enforcement duties including maintaining regular patrols and responding to calls for service. They may direct traffic at the scene of a fire, investigate a burglary, or give first aid to an accident victim. In large police departments, officers usually are assigned to a specific type of duty. Many urban police agencies are becoming more involved in community policing—a practice in which an officer builds relationships with the citizens of local neighborhoods and mobilizes the public to help fight crime.

Police agencies are usually organized into geographic districts, with uniformed officers assigned to patrol a specific area, such as part of the business district or outlying residential neighborhoods. Officers may work alone, but in large agencies they often patrol with a partner. While on patrol, officers attempt to become thoroughly familiar with their patrol area and remain alert for anything unusual. Suspicious circumstances and hazards to public safety are investigated or noted, and officers are dispatched to individual calls for assistance within their district. During their shift, they may identify, pursue, and arrest suspected criminals, resolve problems within the community, and enforce traffic laws.

Public college and university police forces, public school district police, and agencies serving transportation systems and facilities are examples of special police agencies. These agencies have special geographic jurisdictions or enforcement responsibilities in the United States. Most sworn personnel in special agencies are uniformed officers, a smaller number are investigators.

Some police officers specialize in such diverse fields as chemical and microscopic analysis, training and firearms instruction, or handwriting and fingerprint identification. Others work with special units such as horseback, bicycle, motorcycle or harbor patrol, canine corps, or special weapons and tactics (SWAT) or emergency response teams. A few local and special law enforcement officers primarily perform jail-related duties or work in courts. Regardless of job duties or location, police officers and detectives at all levels must write reports and maintain meticulous records that will be needed if they testify in court.

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*Sheriffs and deputy sheriffs* enforce the law on the county level. Sheriffs are usually elected to their posts and perform duties similar to those of a local or county police chief. Sheriffs' departments tend to be relatively small, most having fewer than 25 sworn officers. A deputy sheriff in a large agency will have law enforcement duties similar to those of officers in urban police departments. Police and sheriffs' deputies who provide security in city and county courts are sometimes called bailiffs. (For information on other officers who work in jails and prisons, see correctional officers elsewhere in the *Handbook*.)

*State police officers* (sometimes called *State troopers* or *highway patrol officers*) arrest criminals Statewide and patrol highways to enforce motor vehicle laws and regulations. Uniformed officers are best known for issuing traffic citations to motorists who violate the law. At the scene of accidents, they may direct traffic, give first aid, and call for emergency equipment. They also write reports used to determine the cause of the accident. State police officers are frequently called upon to render assistance to other law enforcement agencies, especially those in rural areas or small towns.

State law enforcement agencies operate in every State except Hawaii. Most full-time sworn personnel are uniformed officers who regularly patrol and respond to calls for service. Others are investigators, perform court-related duties, or work in administrative or other assignments.

*Detectives* are plainclothes investigators who gather facts and collect evidence for criminal cases. Some are assigned to interagency task forces to combat specific types of crime. They conduct interviews, examine records, observe the activities of suspects, and participate in raids or arrests. Detectives and State and Federal agents and inspectors usually specialize in one of a wide variety of violations such as homicide or fraud. They are assigned cases on a rotating basis and work on them until an arrest and conviction occurs or the case is dropped.

The Federal Government maintains a high profile in many areas of law enforcement. *Federal Bureau of Investigation (FBI) agents* are the Government's principal investigators, responsible for investigating violations of more than 260 statutes and conducting sensitive national security investigations. Agents may conduct surveillance, monitor court-authorized wiretaps, examine business records, investigate white-collar crime, track the interstate movement of stolen property, collect evidence of espionage activities, or participate in sensitive undercover assignments. The FBI investigates organized crime, public corruption, financial crime, fraud against the government, bribery, copyright infringement, civil rights violations, bank robbery, extortion, kidnapping, air piracy, terrorism, espionage, interstate criminal activity, drug trafficking, and other violations of Federal statutes.

*U.S. Drug Enforcement Administration (DEA) agents* enforce laws and regulations relating to illegal drugs. Not only is the DEA the lead agency for domestic enforcement of Federal drug laws, it also has sole responsibility for coordinating and pursuing U.S. drug investigations abroad. Agents may conduct complex criminal investigations, carry out surveillance of criminals, and infiltrate illicit drug organizations using undercover techniques.

*U.S. marshals and deputy marshals* protect the Federal courts and ensure the effective operation of the judicial system. They provide protection for the Federal judiciary, transport Federal prisoners, protect Federal witnesses, and manage assets seized from criminal enterprises. They enjoy the widest jurisdiction of any Federal law enforcement agency and are involved to some degree in nearly all Federal law enforcement efforts. In addition, U.S. marshals pursue and arrest Federal fugitives.

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*U.S. Immigration and Naturalization Service (INS) agents and inspectors* facilitate the entry of legal visitors and immigrants to the U.S. and detain and deport those arriving illegally. They consist of border patrol agents, immigration inspectors, criminal investigators and immigration agents, and detention and deportation officers. *U.S. Border Patrol agents* protect more than 8,000 miles of international land and water boundaries. Their missions are to detect and prevent the smuggling and unlawful entry of undocumented foreign nationals into the U.S., apprehend those persons found in violation of the immigration laws, and interdict contraband, such as narcotics. *Immigration inspectors* interview and examine people seeking entrance to the U.S. and its territories. They inspect passports to determine whether people are legally eligible to enter the United States. Immigration inspectors also prepare reports, maintain records, and process applications and petitions for immigration or temporary residence in the United States.

*Bureau of Alcohol, Tobacco, Firearms, and Explosives agents* regulate and investigate violations of Federal firearms and explosives laws, as well as Federal alcohol and tobacco tax regulations. *Customs agents* investigate violations of narcotics smuggling, money laundering, child pornography, customs fraud, and enforcement of the Arms Export Control Act. Domestic and foreign investigations involve the development and use of informants, physical and electronic surveillance, and examination of records from importers/exporters, banks, couriers, and manufacturers. They conduct interviews, serve on joint task forces with other agencies, and get and execute search warrants.

*Customs inspectors* inspect cargo, baggage, and articles worn or carried by people and carriers including vessels, vehicles, trains and aircraft entering or leaving the U.S. to enforce laws governing imports and exports. These inspectors examine, count, weigh, gauge, measure, and sample commercial and noncommercial cargoes entering and leaving the United States. Customs inspectors seize prohibited or smuggled articles, intercept contraband, and apprehend, search, detain, and arrest violators of U.S. laws.

*U.S. Secret Service special agents* protect the President, Vice President, and their immediate families; Presidential candidates; former Presidents; and foreign dignitaries visiting the United States. Secret Service agents also investigate counterfeiting, forgery of Government checks or bonds, and fraudulent use of credit cards.

The U.S. Department of State *Bureau of Diplomatic Security special agents* are engaged in the battle against terrorism. Overseas, they advise ambassadors on all security matters and manage a complex range of security programs designed to protect personnel, facilities, and information. In the U.S., they investigate passport and visa fraud, conduct personnel security investigations, issue security clearances, and protect the Secretary of State and a number of foreign dignitaries. They also train foreign civilian police and administer a counter-terrorism reward program.

Other Federal agencies employ police and special agents with sworn arrest powers and the authority to carry firearms. These agencies include the Postal Service, the Bureau of Indian Affairs Office of Law Enforcement, the Forest Service, the National Park Service, and the Federal Air Marshals.

## Working Conditions

Police work can be very dangerous and stressful. In addition to the obvious dangers of confrontations with criminals, officers need to be constantly alert and ready to deal appropriately with a number of other threatening situations. Many law enforcement officers witness death and

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suffering resulting from accidents and criminal behavior. A career in law enforcement may take a toll on officers' private lives.

Uniformed officers, detectives, agents, and inspectors are usually scheduled to work 40-hour weeks, but paid overtime is common. Shift work is necessary because protection must be provided around the clock. Junior officers frequently work weekends, holidays, and nights. Police officers and detectives are required to work at any time their services are needed and may work long hours during investigations. In most jurisdictions, whether on or off duty, officers are expected to be armed and to exercise their arrest authority whenever necessary.

The jobs of some Federal agents such as U.S. Secret Service and DEA special agents require extensive travel, often on very short notice. They may relocate a number of times over the course of their careers. Some special agents in agencies such as the U.S. Border Patrol work outdoors in rugged terrain for long periods and in all kinds of weather.

## Employment

Police and detectives held about 840,000 jobs in 2002. About 81 percent were employed by local governments. State police agencies employed about 11 percent and various Federal agencies employed about 6 percent. A small proportion worked for educational services, rail transportation, and contract investigation and security services.

According to the U.S. Bureau of Justice Statistics, police and detectives employed by local governments primarily worked in cities with more than 25,000 inhabitants. Some cities have very large police forces, while thousands of small communities employ fewer than 25 officers each.

## Training, Other Qualifications, and Advancement

Civil service regulations govern the appointment of police and detectives in practically all States, large municipalities, and special police agencies, as well as in many smaller ones. Candidates must be U.S. citizens, usually at least 20 years of age, and must meet rigorous physical and personal qualifications. In the Federal Government, candidates must be at least 21 years of age but less than 37 years of age at the time of appointment. Physical examinations for entrance into law enforcement often include tests of vision, hearing, strength, and agility. Eligibility for appointment usually depends on performance in competitive written examinations and previous education and experience. In larger departments, where the majority of law enforcement jobs are found, applicants usually must have at least a high school education. Federal and State agencies typically require a college degree. Candidates should enjoy working with people and meeting the public.

Because personal characteristics such as honesty, sound judgment, integrity, and a sense of responsibility are especially important in law enforcement, candidates are interviewed by senior officers, and their character traits and backgrounds are investigated. In some agencies, candidates are interviewed by a psychiatrist or a psychologist, or given a personality test. Most applicants are subjected to lie detector examinations or drug testing. Some agencies subject sworn personnel to random drug testing as a condition of continuing employment.

Before their first assignments, officers usually go through a period of training. In State and large local departments, recruits get training in their agency's police academy, often for 12 to 14 weeks. In small agencies, recruits often attend a regional or State academy. Training includes classroom

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instruction in constitutional law and civil rights, State laws and local ordinances, and accident investigation. Recruits also receive training and supervised experience in patrol, traffic control, use of firearms, self-defense, first aid, and emergency response. Police departments in some large cities hire high school graduates who are still in their teens as police cadets or trainees. They do clerical work and attend classes, usually for 1 to 2 years, at which point they reach the minimum age requirement and may be appointed to the regular force.

Police officers usually become eligible for promotion after a probationary period ranging from 6 months to 3 years. In a large department, promotion may enable an officer to become a detective or specialize in one type of police work, such as working with juveniles. Promotions to corporal, sergeant, lieutenant, and captain usually are made according to a candidate's position on a promotion list, as determined by scores on a written examination and on-the-job performance.

To be considered for appointment as an FBI agent, an applicant either must be a graduate of an accredited law school or a college graduate with a major in accounting, fluency in a foreign language, or 3 years of related full-time work experience. All new agents undergo 16 weeks of training at the FBI academy on the U.S. Marine Corps base in Quantico, Virginia.

Applicants for special agent jobs with the U.S. Secret Service and the Bureau of Alcohol, Tobacco, Firearms, and Explosives must have a bachelor's degree or a minimum of 3 years' related work experience. Prospective special agents undergo 10 weeks of initial criminal investigation training at the Federal Law Enforcement Training Center in Glynco, Georgia, and another 17 weeks of specialized training with their particular agencies.

Applicants for special agent jobs with the U.S. Drug Enforcement Administration (DEA) must have a college degree and either 1 year of experience conducting criminal investigations, 1 year of graduate school, or have achieved at least a 2.95 grade point average while in college. DEA special agents undergo 14 weeks of specialized training at the FBI Academy in Quantico, Virginia.

U.S. Border Patrol agents must be U.S. citizens, younger than 37 years of age at the time of appointment, possess a valid driver's license, and pass a three-part examination on reasoning and language skills. A bachelor's degree or previous work experience that demonstrates the ability to handle stressful situations, make decisions, and take charge is required for a position as a Border Patrol agent. Applicants may qualify through a combination of education and work experience.

Postal inspectors must have a bachelor's degree and 1 year of related work experience. It is desirable that they have one of several professional certifications, such as that of certified public accountant. They also must pass a background suitability investigation, meet certain health requirements, undergo a drug screening test, possess a valid State driver's license, and be a U.S. citizen between 21 and 36 years of age when hired.

Law enforcement agencies are encouraging applicants to take postsecondary school training in law enforcement-related subjects. Many entry-level applicants for police jobs have completed some formal postsecondary education and a significant number are college graduates. Many junior colleges, colleges, and universities offer programs in law enforcement or administration of justice. Other courses helpful in preparing for a career in law enforcement include accounting, finance, electrical engineering, computer science, and foreign languages. Physical education and sports are helpful in developing the competitiveness, stamina, and agility needed for many law enforcement positions. Knowledge of a foreign language is an asset in many Federal agencies and urban departments.

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Continuing training helps police officers, detectives, and special agents improve their job performance. Through police department academies, regional centers for public safety employees established by the States, and Federal agency training centers, instructors provide annual training in self-defense tactics, firearms, use-of-force policies, sensitivity and communications skills, crowd-control techniques, relevant legal developments, and advances in law enforcement equipment. Many agencies pay all or part of the tuition for officers to work toward degrees in criminal justice, police science, administration of justice, or public administration, and pay higher salaries to those who earn such a degree.

## Job Outlook

The opportunity for public service through law enforcement work is attractive to many because the job is challenging and involves much personal responsibility. Furthermore, law enforcement officers in many agencies may retire with a pension after 20 or 25 years of service, allowing them to pursue a second career while still in their 40s. Because of relatively attractive salaries and benefits, the number of qualified candidates exceeds the number of job openings in Federal law enforcement agencies and in most State police departments—resulting in increased hiring standards and selectivity by employers. Competition should remain keen for higher paying jobs with State and Federal agencies and police departments in more affluent areas. Opportunities will be better in local and special police departments, especially in departments that offer relatively low salaries, or in urban communities where the crime rate is relatively high. Applicants with college training in police science, military police experience, or both should have the best opportunities.

Employment of police and detectives is expected to grow faster than the average for all occupations through 2012. A more security-conscious society and concern about drug-related crimes should contribute to the increasing demand for police services.

The level of government spending determines the level of employment for police and detectives. The number of job opportunities, therefore, can vary from year to year and from place to place. Layoffs, on the other hand, are rare because retirements enable most staffing cuts to be handled through attrition. Trained law enforcement officers who lose their jobs because of budget cuts usually have little difficulty finding jobs with other agencies. The need to replace workers who retire, transfer to other occupations, or stop working for other reasons will be the source of many job openings.

## Earnings

Police and sheriff's patrol officers had median annual earnings of \$42,270 in 2002. The middle 50 percent earned between \$32,300 and \$53,500. The lowest 10 percent earned less than \$25,270, and the highest 10 percent earned more than \$65,330. Median annual earnings were \$47,090 in State government, \$42,020 in local government, and \$41,600 in Federal Government.

In 2002, median annual earnings of police and detective supervisors were \$61,010. The middle 50 percent earned between \$47,210 and \$74,610. The lowest 10 percent earned less than \$36,340, and the highest 10 percent earned more than \$90,070. Median annual earnings were \$78,230 in Federal Government, \$64,410 in State government, and \$59,830 in local government.

In 2002, median annual earnings of detectives and criminal investigators were \$51,410. The middle 50 percent earned between \$39,010 and \$65,980. The lowest 10 percent earned less than

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\$31,010, and the highest 10 percent earned more than \$80,380. Median annual earnings were \$66,500 in Federal Government, \$47,700 in local government, and \$46,600 in State government.

Federal law provides special salary rates to Federal employees who serve in law enforcement. Additionally, Federal special agents and inspectors receive law enforcement availability pay (LEAP)—equal to 25 percent of the agent's grade and step—awarded because of the large amount of overtime that these agents are expected to work. For example, in 2003 FBI agents enter Federal service as GS-10 employees on the pay scale at a base salary of \$39,115, yet earned about \$48,890 a year with availability pay. They can advance to the GS-13 grade level in field nonsupervisory assignments at a base salary of \$61,251, which is worth \$76,560 with availability pay. FBI supervisory, management, and executive positions in grades GS-14 and GS-15 pay a base salary of about \$72,381 or \$85,140 a year, respectively, and equaled \$90,480 or \$106,430 per year including availability pay. Salaries were slightly higher in selected areas where the prevailing local pay level was higher. Because Federal agents may be eligible for a special law enforcement benefits package, applicants should ask their recruiter for more information.

According to the International City-County Management Association's annual Police and Fire Personnel, Salaries, and Expenditures Survey, average salaries for sworn full-time positions in 2002 were as follows:

	Minimum annual base salary	Maximum annual base salary
Police chief	\$68,337	\$87,037
Deputy chief	59,790	75,266
Police captain	56,499	70,177
Police lieutenant	52,446	63,059
Police sergeant	46,805	55,661
Police corporal	39,899	49,299

Total earnings for local, State, and special police and detectives frequently exceed the stated salary because of payments for overtime, which can be significant. In addition to the common benefits—paid vacation, sick leave, and medical and life insurance—most police and sheriffs' departments provide officers with special allowances for uniforms. Because police officers usually are covered by liberal pension plans, many retire at half-pay after 20 or 25 years of service.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Police and Detectives, on the Internet at <http://www.bls.gov/oco/ocos160.htm>.

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## Radiologic Technologists and Technicians

### Significant Points

- Formal training programs in radiography range in length from 1 to 4 years and lead to a certificate, associate degree, or bachelor's degree.
- Although hospitals will remain the primary employer, a greater number of new jobs will be found in physicians' offices and diagnostic imaging centers.
- Job opportunities are expected to be favorable; some employers report difficulty hiring sufficient numbers of radiologic technologists and technicians.

### Nature of the Work

Radiologic technologists and technicians take x rays and administer nonradioactive materials into patients' bloodstreams for diagnostic purposes. Some specialize in diagnostic imaging technologies, such as computerized tomography (CT) and magnetic resonance imaging (MRI).

In addition to radiologic technologists and technicians, others who conduct diagnostic imaging procedures include cardiovascular technologists and technicians, diagnostic medical sonographers, and nuclear medicine technologists. (Each is discussed elsewhere in the *Handbook*.)

Radiologic technologists and technicians, also referred to as *radiographers*, produce x ray films (radiographs) of parts of the human body for use in diagnosing medical problems. They prepare patients for radiologic examinations by explaining the procedure, removing articles such as jewelry, through which x rays cannot pass, and positioning patients so that the parts of the body can be appropriately radiographed. To prevent unnecessary radiation exposure, these workers surround the exposed area with radiation protection devices, such as lead shields, or limit the size of the x ray beam. Radiographers position radiographic equipment at the correct angle and height over the appropriate area of a patient's body. Using instruments similar to a measuring tape, they may measure the thickness of the section to be radiographed and set controls on the x ray machine to produce radiographs of the appropriate density, detail, and contrast. They place the x ray film under the part of the patient's body to be examined and make the exposure. They then remove the film and develop it.

Experienced radiographers may perform more complex imaging procedures. For fluoroscopies, radiographers prepare a solution of contrast medium for the patient to drink, allowing the radiologist (a physician who interprets radiographs) to see soft tissues in the body. Some radiographers, called *CT technologists*, operate CT scanners to produce cross-sectional images of patients. Radiographers who operate machines that use strong magnets and radio waves, rather than radiation, to create an image are called *MRI technologists*.

Radiologic technologists and technicians must follow physicians' orders precisely and conform to regulations concerning the use of radiation to protect themselves, their patients, and their coworkers from unnecessary exposure.

In addition to preparing patients and operating equipment, radiologic technologists and technicians keep patient records and adjust and maintain equipment. They also may prepare work schedules, evaluate equipment purchases, or manage a radiology department.

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## Working Conditions

Most full-time radiologic technologists and technicians work about 40 hours a week; they may have evening, weekend, or on-call hours. Opportunities for part-time and shift work also are available.

Because technologists and technicians are on their feet for long periods and may lift or turn disabled patients, physical stamina is important. Technologists and technicians work at diagnostic machines, but may also perform some procedures at patients' bedsides. Some travel to patients in large vans equipped with sophisticated diagnostic equipment.

Although radiation hazards exist in this occupation, they are minimized by the use of lead aprons, gloves, and other shielding devices, as well as by instruments monitoring radiation exposure. Technologists and technicians wear badges measuring radiation levels in the radiation area, and detailed records are kept on their cumulative lifetime dose.

## Employment

Radiologic technologists and technicians held about 174,000 jobs in 2002. Almost 1 in 5 worked part time. About half of all jobs were in hospitals. Most of the rest were in offices of physicians; medical and diagnostic laboratories, including diagnostic imaging centers; and outpatient care centers.

## Training, Other Qualifications, and Advancement

Preparation for this profession is offered in hospitals, colleges and universities, vocational-technical institutes, and the U.S. Armed Forces. Hospitals, which employ most radiologic technologists and technicians, prefer to hire those with formal training.

Formal training programs in radiography range in length from 1 to 4 years and lead to a certificate, associate degree, or bachelor's degree. Two-year associate degree programs are most prevalent.

Some 1-year certificate programs are available for experienced radiographers or individuals from other health occupations, such as medical technologists and registered nurses, who want to change fields or specialize in CT or MRI. A bachelor's or master's degree in one of the radiologic technologies is desirable for supervisory, administrative, or teaching positions.

The Joint Review Committee on Education in Radiologic Technology accredits most formal training programs for the field. The committee accredited 587 radiography programs in 2003. Radiography programs require, at a minimum, a high school diploma or the equivalent. High school courses in mathematics, physics, chemistry, and biology are helpful. The programs provide both classroom and clinical instruction in anatomy and physiology, patient care procedures, radiation physics, radiation protection, principles of imaging, medical terminology, positioning of patients, medical ethics, radiobiology, and pathology.

Federal legislation protects the public from the hazards of unnecessary exposure to medical and dental radiation by ensuring operators of radiologic equipment are properly trained. Under this legislation, the Federal Government sets voluntary standards that the States, in turn, may use for

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accrediting training programs and certifying individuals who engage in medical or dental radiography.

In 2003, about 38 States licensed radiologic technologists and technicians. Voluntary registration is offered by the American Registry of Radiologic Technologists. To be eligible for registration, technologists generally must have graduated from an accredited program and pass an examination. Many employers prefer to hire registered radiographers. To be recertified, radiographers must complete 24 hours of continuing education every other year.

Radiologic technologists and technicians should be sensitive to patients' physical and psychological needs. They must pay attention to detail, follow instructions, and work as part of a team. In addition, operating complicated equipment requires mechanical ability and manual dexterity.

With experience and additional training, staff technologists may become specialists, performing CT scanning, angiography, and magnetic resonance imaging. Experienced technologists also may be promoted to supervisor, chief radiologic technologist, and, ultimately, department administrator or director. Depending on the institution, courses or a master's degree in business or health administration may be necessary for the director's position. Some technologists progress by leaving the occupation to become instructors or directors in radiologic technology programs; others take jobs as sales representatives or instructors with equipment manufacturers.

## Job Outlook

Job opportunities are expected to be favorable. Some employers report difficulty hiring sufficient numbers of radiologic technologists and technicians. Imbalances between the demand for, and supply of, qualified workers should spur efforts to attract and retain qualified radiologic technologists and technicians. As an example of such efforts, employers may provide more flexible training programs or improve compensation and working conditions.

Radiologic technologists who also are experienced in more complex diagnostic imaging procedures, such as CT or MRI, will have better employment opportunities, as employers seek to control costs by using multiskilled employees.

Employment of radiologic technologists and technicians is expected to grow faster than the average for all occupations through 2012, as the population grows and ages, increasing the demand for diagnostic imaging. Although healthcare providers are enthusiastic about the clinical benefits of new technologies, the extent to which they are adopted depends largely on cost and reimbursement considerations. For example, digital imaging technology can improve quality and efficiency, but remains expensive. Some promising new technologies may not come into widespread use because they are too expensive and third-party payers may not be willing to pay for their use.

Hospitals will remain the principal employer of radiologic technologists and technicians. However, a greater number of new jobs will be found in offices of physicians and diagnostic imaging centers. Health facilities such as these are expected to grow rapidly through 2012, due to the strong shift toward outpatient care, encouraged by third-party payers and made possible by technological advances that permit more procedures to be performed outside the hospital. Some job openings also will arise from the need to replace technologists and technicians who leave the occupation.

# Fastest Growing Careers in California That Require Less Than a 4 Year Degree: Career Details

(Presented in Alphabetical Order)

## Earnings

Median annual earnings of radiologic technologists and technicians were \$38,970 in 2002. The middle 50 percent earned between \$32,370 and \$46,510. The lowest 10 percent earned less than \$27,190, and the highest 10 percent earned more than \$55,430. Median annual earnings in the industries employing the largest numbers of radiologic technologists and technicians in 2002 were as follows:

Medical and diagnostic laboratories	\$42,470
General medical and surgical hospitals	39,580
Offices of physicians	36,490

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Radiologic Technologists and Technicians, on the Internet at <http://www.bls.gov/oco/ocos105.htm>.

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## Registered Nurses

### 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 instruct individuals,

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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-lighted, 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 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.

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## 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, microbiology, 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.

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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 freestanding ambulatory surgical and emergency centers. Accordingly, employment is expected to grow faster than average in these places as healthcare in general expands.

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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.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Registered Nurses, on the Internet at <http://www.bls.gov/oco/ocos083.htm>.

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## Social and Human Service Assistants

### Significant Points

- While a bachelor's degree usually is not required, employers increasingly seek individuals with relevant work experience or education beyond high school.
- Employment is projected to grow much faster than average.
- Job opportunities should be excellent, particularly for applicants with appropriate postsecondary education, but pay is low.

### Nature of the Work

Social and human service assistant is a generic term for people with a wide array of job titles, including human service worker, case management aide, social work assistant, community support worker, mental health aide, community outreach worker, life skill counselor, or gerontology aide. They usually work under the direction of professionals from a variety of fields, such as nursing, psychiatry, psychology, rehabilitative or physical therapy, or social work. The amount of responsibility and supervision they are given varies a great deal. Some have little direct supervision; others work under close direction.

Social and human service assistants provide direct and indirect client services to ensure that individuals in their care reach their maximum level of functioning. They assess clients' needs, establish their eligibility for benefits and services such as food stamps, Medicaid, or welfare, and help to obtain them. They also arrange for transportation and escorts, if necessary, and provide emotional support. Social and human service assistants monitor and keep case records on clients and report progress to supervisors and case managers.

Social and human service assistants play a variety of roles in a community. They may organize and lead group activities, assist clients in need of counseling or crisis intervention, or administer a food bank or emergency fuel program. In halfway houses, group homes, and government-supported housing programs, they assist adults who need supervision with personal hygiene and daily living skills. They review clients' records, ensure that they take correct doses of medication, talk with family members, and confer with medical personnel and other caregivers to gain better insight into clients' backgrounds and needs. Social and human service assistants also provide emotional support and help clients become involved in their own well-being, in community recreation programs, and in other activities.

In psychiatric hospitals, rehabilitation programs, and outpatient clinics, social and human service assistants work with professional care providers, such as psychiatrists, psychologists, and social workers, to help clients master everyday living skills, communicate more effectively, and get along better with others. They support the client's participation in a treatment plan, such as individual or group counseling or occupational therapy.

### Working Conditions

Working conditions of social and human service assistants vary. Some work in offices, clinics, and hospitals, while others work in group homes, shelters, sheltered workshops, and day

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programs. Many spend their time in the field visiting clients. Most work a 40-hour week, although some work in the evening and on weekends.

The work, while satisfying, can be emotionally draining. Understaffing and relatively low pay may add to the pressure. Turnover is reported to be high, especially among workers without academic preparation for this field.

## Employment

Social and human service assistants held about 305,000 jobs in 2002. More than half worked in the health care and social assistance industries. Almost one third were employed by State and local governments, primarily in public welfare agencies and facilities for mentally disabled and developmentally challenged individuals.

## Training, Other Qualifications, and Advancement

While a bachelor's degree usually is not required for entry into this occupation, employers increasingly seek individuals with relevant work experience or education beyond high school. Certificates or associate degrees in subjects such as social work, human services, gerontology, or one of the social or behavioral sciences meet most employers' requirements. Some jobs may require a bachelor's or master's degree in human services or a related field such as counseling, rehabilitation, or social work.

Human services degree programs have a core curriculum that trains students to observe patients and record information, conduct patient interviews, implement treatment plans, employ problem-solving techniques, handle crisis intervention matters, and use proper case management and referral procedures. General education courses in liberal arts, sciences, and the humanities also are part of the curriculum. Many degree programs require completion of a supervised internship.

Educational attainment often influences the kind of work employees may be assigned and the degree of responsibility that may be entrusted to them. For example, workers with no more than a high school education are likely to receive extensive on-the-job training to work in direct-care services, while employees with a college degree might be assigned to do supportive counseling, coordinate program activities, or manage a group home. Social and human service assistants with proven leadership ability, either from previous experience or as a volunteer in the field, often have greater autonomy in their work. Regardless of the academic or work background of employees, most employers provide some form of inservice training, such as seminars and workshops, to their employees.

There may be additional hiring requirements in group homes. For example, employers may require employees to have a valid driver's license or to submit to a criminal background investigation.

Employers try to select applicants who have effective communication skills, a strong sense of responsibility, and the ability to manage time effectively. Many human services jobs involve direct contact with people who are vulnerable to exploitation or mistreatment; therefore, patience, understanding, and a strong desire to help others are highly valued characteristics.

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Formal education almost always is necessary for advancement. In general, advancement requires a bachelor's or master's degree in human services, counseling, rehabilitation, social work, or a related field.

## Job Outlook

Job opportunities for social and human service assistants are expected to be excellent, particularly for applicants with appropriate postsecondary education. The number of social and human service assistants is projected to grow much faster than the average for all occupations between 2002 and 2012—ranking the occupation among the most rapidly growing. Many additional job opportunities will arise from the need to replace workers who advance into new positions, retire, or leave the workforce for other reasons. There will be more competition for jobs in urban areas than in rural areas, but qualified applicants should have little difficulty finding employment. Faced with rapid growth in the demand for social and human services many employers increasingly rely on social and human service assistants to undertake greater responsibility for delivering services to clients.

Opportunities are expected to be good in private social service agencies, which provide such services as adult daycare and meal delivery programs. Employment in private agencies will grow as State and local governments continue to contract out services to the private sector in an effort to cut costs. Demand for social services will expand with the growing elderly population, who are more likely to need these services. In addition, more social and human service assistants will be needed to provide services to pregnant teenagers, the homeless, the mentally disabled and developmentally challenged, and substance abusers. Some private agencies have been employing more social and human service assistants in place of social workers, who are more educated and, thus, more highly paid.

Job training programs also are expected to require additional social and human service assistants. As social welfare policies shift focus from benefit-based programs to work-based initiatives, there will be more demand for people to teach job skills to the people who are new to, or returning to, the workforce.

Residential care establishments should face increased pressures to respond to the needs of the mentally and physically disabled. Many of these patients have been deinstitutionalized and lack the knowledge or the ability to care for themselves. Also, more community-based programs, supported independent-living sites, and group residences are expected to be established to house and assist the homeless and the mentally and physically disabled. As substance abusers are increasingly being sent to treatment programs instead of prison, employment of social and human service assistants in substance abuse treatment programs also will grow.

The number of jobs for social and human service assistants in State and local governments will grow but not as fast as employment for social and human service assistants in other industries. Employment in the public sector may fluctuate with the level of funding provided by State and local governments. Also, some State and local governments are contracting out selected social services to private agencies in order to save money.

## Earnings

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Median annual earnings of social and human service assistants were \$23,370 in 2002. The middle 50 percent earned between \$18,670 and \$29,520. The top 10 percent earned more than \$37,550, while the lowest 10 percent earned less than \$15,420.

Median annual earnings in the industries employing the largest numbers of social and human service assistants in 2002 were:

State government	\$31,280
Local government	26,570
Individual and family services	22,210
Community food and housing, and emergency and other relief services	21,840
Residential mental retardation, mental health and substance abuse facilities	20,010

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Social and Human Service Assistants, on the Internet at <http://www.bls.gov/oco/ocos059.htm>.

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## Teachers—Adult Literacy and Remedial and Self-enrichment Education

### Significant Points

- Many adult literacy and remedial and self-enrichment teachers work part time and receive no benefits; unpaid volunteers also teach these subjects.
- Opportunities for teachers of English as a second language are expected to be very good, due to the expected increase in the number of residents with limited English skills who seek classes.
- Demand for self-enrichment courses is expected to rise with growing numbers of people who embrace lifelong learning and of retirees who have more free time to take classes.

### Nature of the Work

*Self-enrichment teachers* teach courses that students take for pleasure or personal enrichment; these classes are not usually intended to lead to a particular degree or vocation. Self-enrichment teachers may instruct children or adults in a wide variety of areas, such as cooking, dancing, creative writing, photography, or personal finance. In contrast, *adult literacy and remedial education teachers* provide adults and out-of-school youths with the education they need to read, write, and speak English and to perform elementary mathematical calculations—basic skills that equip them to solve problems well enough to become active participants in our society, to hold a job, and to further their education. The instruction provided by these teachers can be divided into three principle categories: *remedial or adult basic education (ABE)*, which is geared toward adults whose skills are either at or below an eighth-grade level; *adult secondary education (ASE)*, which is geared towards students who wish to obtain their General Educational Development (GED) certificate or other high school equivalency credential; and *English literacy*, which provides instruction for adults with limited proficiency in English. Traditionally, the students in adult literacy and remedial (basic) education classes were made up primarily of those who did not graduate high school or who passed through school without the knowledge needed to meet their educational goals or to participate fully in today's high-skill society. Increasingly, however, students in these classes are immigrants or other people whose native language is not English. Educators who work with adult English-language learners are usually called *teachers of English as a second language (ESL)* or *teachers of English to speakers of other languages (ESOL)*.

Self-enrichment teachers, due to the wide range of classes and subjects they teach, may have styles and methods of instruction that differ greatly. The majority of self-enrichment classes are relatively informal and nonintensive in terms of instructional demands. Some classes, such as pottery or sewing, may be largely hands-on, requiring students to practice doing things themselves in order to learn. In that case, teachers may demonstrate methods or techniques for their class and subsequently supervise students' progress as they attempt to carry out the same or similar tasks or actions. Other classes, such as those involving financial planning or religion and spirituality, may be somewhat more academic in nature. Teachers of these classes are likely to rely more heavily on lectures and group discussions as methods of instruction. Classes offered through religious institutions, such as marriage preparation or classes in religion for children, may also be taught by self-enrichment teachers.

Many of the classes that self-enrichment educators teach are shorter in duration than classes taken for academic credit; some finish in 1 or 2 days to several weeks. These brief classes tend to be introductory in nature and generally focus on only one topic—for example, a cooking class

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that teaches students how to make bread. Some self-enrichment classes introduce children and youths to activities such as piano or drama, and may be designed to last anywhere from 1 week to several months. These and other self-enrichment classes may be scheduled to occur after school or during school vacations.

Remedial education teachers, more commonly called adult basic education teachers, teach basic academic courses in mathematics, languages, history, reading, writing, science, and other areas, using instructional methods geared toward adult learning. They teach these subjects to students 16 years of age and older who demonstrate the need to increase their skills in one or more of the subject areas mentioned. Classes are taught to appeal to a variety of learning styles and usually include large-group, small-group, and one-on-one instruction. Because the students often are at different proficiency levels for different subjects, adult basic education teachers must make individual assessments of each student's abilities beforehand. In many programs, the assessment is used to develop an individualized education plan for each student. Teachers are required to evaluate students periodically to determine their progress and potential for advancement to the next level.

Teachers in remedial or adult basic education may have to assist students in acquiring effective study skills and the self-confidence they need to reenter an academic environment. Teachers also may encounter students with a learning or physical disability that requires additional expertise. Teachers should possess an understanding of how to help these students achieve their goals, but they also may need to have the knowledge to detect challenges their students may have and provide them with access to a broader system of additional services that are required to address their challenges.

For students who wish to get a GED credential in order to get a job or qualify for postsecondary education, adult secondary education or GED teachers provide help in acquiring the necessary knowledge and skills to pass the test. The GED tests students in subject areas such as reading, writing, mathematics, science, and social studies, while at the same time measuring students' communication, information-processing, problem-solving, and critical-thinking skills. The emphasis in class is on acquiring the knowledge needed to pass the GED test, as well as preparing students for success in further educational endeavors.

ESOL teachers help adults to speak, listen, read, and write in English, often in the context of real-life situations to promote learning. More advanced students may concentrate on writing and conversational skills or focus on learning more academic or job-related communication skills. ESOL teachers teach adults who possess a wide range of cultures and abilities and who speak a variety of languages. Some of their students have a college degree and many advance quickly through the program owing to a variety of factors, such as their age, previous language experience, educational background, and native language. Others may need additional time due to these same factors. Because the teacher and students often do not share a common language, creativity is an important part of fostering communication in the classroom and achieving learning goals.

All adult literacy, remedial, and self-enrichment teachers must prepare lessons beforehand, do any related paperwork, and stay current in their fields. Attendance for students is mostly voluntary and course work is rarely graded. Many teachers also must learn the latest uses for computers in the classroom, as computers are increasingly being used to supplement instruction in basic skills and in teaching ESOL.

## Working Conditions

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A large number of adult literacy and remedial and self-enrichment education teachers work part time. Some have several part-time teaching assignments or work full time in addition to their part-time teaching job. Classes for adults are held on days and at times that best accommodate students who may have a job or family responsibilities. Similarly, self-enrichment classes for children are usually held after school or during school vacation periods.

Because many of these teachers work with adult students, they do not encounter some of the behavioral or social problems sometimes found with younger students. Adults attend by choice, are highly motivated, and bring years of experience to the classroom—attributes that can make teaching these students rewarding and satisfying. Self-enrichment teachers must have a great deal of patience, particularly when working with young children.

## Employment

Teachers of adult literacy, remedial, and self-enrichment education held about 280,000 jobs in 2002. About 1 in 5 was self-employed. Many additional teachers worked as unpaid volunteers.

Nearly three-quarters, or 200,000, of the jobs were held by self-enrichment teachers. The largest numbers of these workers were employed by public and private educational institutions, religious organizations, and providers of social assistance and amusement and recreation services.

Adult literacy, basic education, and GED teachers and instructors held about 80,000 jobs. Many of the jobs are federally funded, with additional funds coming from State and local governments. The education industry employs the majority of these teachers, who work in adult learning centers, libraries, or community colleges. Others work for social service organizations such as job-training or residential care facilities. Still others work for State and local governments, providing basic education at juvenile detention and corrections institutions, among other places.

## Training, Other Qualifications, and Advancement

The main qualification for self-enrichment teachers is expertise in their subject area; however, requirements may vary greatly with both the type of class taught and the place of employment. In some cases, a portfolio of one's work may be required. For example, to secure a job teaching a photography course, an applicant would need to show examples of previous work. Special certification may be required to teach some subjects, such as a Red Cross water safety instructor certificate to teach swimming. Some self-enrichment teachers are trained educators or other professionals who teach enrichment classes in their spare time. In some disciplines, such as art or music, specific teacher training programs are available. Prospective dance teachers, for example, may complete programs that prepare them to instruct any number of types of dance—from ballroom dancing to ballet. Self-enrichment teachers also should have good speaking skills and a talent for making the subject interesting. Patience and the ability to explain and instruct students at a basic level are important as well, particularly when one is working with children.

Requirements for teaching adult literacy and basic and secondary education vary by State and by program. Federally funded programs run by State and local governments require high accountability and student achievement standards. Those programs run by religious, community, or volunteer organizations, rather than State-run, federally funded programs, generally develop standards based on their own needs and organizational goals. Most State and local governments and educational institutions require that adult teachers have at least a bachelor's degree and, preferably, a master's degree. Some—especially school districts that hire adult education

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teachers—require an elementary or secondary school teaching certificate. A few have begun requiring a special certificate in ESOL or adult education. Teaching experience, especially with adults, also is preferred or required. Volunteers usually do not need a bachelor's degree, but often must attend a training program before they are allowed to work with students.

Most programs recommend that adult literacy and basic and secondary education teachers take classes or workshops on teaching adults, using technology to teach, working with learners from a variety of cultures, and teaching adults with learning disabilities. ESOL teachers also should have courses or training in second-language acquisition theory and linguistics. In addition, knowledge of the citizenship and naturalization process may be useful. Knowledge of a second language is not necessary to teach ESOL students, but can be helpful in understanding the students' perspectives. GED teachers should know what is required to pass the GED and be able to instruct students in the subject matter. Training for literacy volunteers usually consists of instruction on effective teaching practices, needs assessment, lesson planning, the selection of appropriate instructional materials, characteristics of adult learners, and cross-cultural awareness.

Adult education and literacy teachers must have the ability to work with a variety of cultures, languages, and educational and economic backgrounds. They must be understanding and respectful of their students' circumstances and be familiar with their concerns. All teachers, both paid and volunteer, should be able to communicate well and motivate their students.

Professional development among adult education and literacy teachers varies widely. Both part-time and full-time teachers are expected to participate in ongoing professional development activities in order to keep current on new developments in the field and to enhance skills already acquired. Each State's professional development system reflects the unique needs and organizational structure of that State. Attendance by teachers at professional development workshops and other activities is often outlined in State or local policy. Some teachers are able to access professional development activities through alternative delivery systems such as the Internet or distance learning.

Opportunities for advancement in these professions, particularly for adult education and literacy teachers, again vary from State to State and program to program. Some part-time teachers are able to move into full-time teaching positions or program administrator positions, such as coordinator or director, when such vacancies occur. Others may decide to use their classroom experience to move into policy work at a nonprofit organization or with the local, State, or Federal government or to perform research. Self-enrichment teachers also may advance to administrative positions or may even go on to start their own school or program. Experienced self-enrichment teachers may mentor new instructors and volunteers.

## Job Outlook

Opportunities for jobs as adult literacy, remedial, and self-enrichment education teachers are expected to be favorable. Employment is expected to grow faster than the average for all occupations through 2012, and a large number of job openings is expected, due to the need to replace people who leave the occupation or retire.

Self-enrichment education teachers account for the largest proportion of jobs in these occupations. The need for self-enrichment teachers is expected to grow as more people embrace lifelong learning and as the baby boomers begin to retire and have more time to take classes. Subjects that are not easily researched on the Internet and those that provide hands-on

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experiences, such as cooking, crafts, and the arts, will be in greater demand. Also, classes on spirituality and selfimprovement are expected to be popular.

As employers increasingly require a more literate workforce, workers' demand for adult literacy, basic education, and secondary education classes is expected to grow. Significant employment growth is anticipated especially for ESOL teachers, who will be needed by the increasing number of immigrants and other residents living in this country who need to learn, or enhance their skills in, English. In addition, a greater proportion of these groups is expected to take ESOL classes. Demand for ESOL teachers will be greatest in States such as California, Florida, Texas, and New York, due to their large populations of residents who have limited English skills. However, parts of the Midwest and Plains States have begun to attract large numbers of immigrants, making for especially good opportunities in those areas as well.

The demand for adult literacy and basic and secondary education often fluctuates with the economy. When the economy is good and workers are hard to find, employers relax their standards and hire workers without a degree or GED or those with limited proficiency in English. As the economy softens, more students find that they need additional education to get a job. However, adult education classes often are subject to changes in funding levels, which can cause the number of teaching jobs to fluctuate from year to year. In addition, factors such as immigration policies and the relative prosperity of the United States compared with other countries may have an impact on the number of immigrants entering this country and, consequently, on the demand for ESOL teachers.

## Earnings

Median hourly earnings of self-enrichment teachers were \$14.09 in 2002. The middle 50 percent earned between \$9.86 and \$19.69. The lowest 10 percent earned less than \$7.37, and the highest 10 percent earned more than \$26.49. Self-enrichment teachers are generally paid by the hour or for each class that they teach.

Median hourly earnings of adult literacy, remedial education, and GED teachers and instructors were \$17.50 in 2002. The middle 50 percent earned between \$13.21 and \$24.00. The lowest 10 percent earned less than \$10.08, and the highest 10 percent earned more than \$34.30. Part-time adult literacy and remedial education and GED instructors are usually paid by the hour or for each class that they teach, and receive few benefits or none at all. Full-time teachers are generally paid a salary and receive health insurance and other benefits if they work for a school system or government.

Source: Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Teachers—Adult Literacy and Remedial and Self-enrichment Education, on the Internet at <http://www.bls.gov/oco/ocos064.htm>.

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## Teachers—Preschool, Kindergarten, Elementary, Middle, and Secondary

### Significant Points

- Public school teachers must have at least a bachelor's degree, complete an approved teacher education program, and be licensed.
- Many States offer alternative licensing programs to attract people into teaching, especially for hard-to-fill positions.
- Excellent job opportunities are expected as a large number of teachers retire over the next 10 years, particularly at the secondary school level; opportunities will vary somewhat by geographic area and subject taught.

### Nature of the Work

Teachers act as facilitators or coaches, using interactive discussions and “hands-on” approaches to help students learn and apply concepts in subjects such as science, mathematics, or English. They utilize “props” or “manipulatives” to help children understand abstract concepts, solve problems, and develop critical thought processes. For example, they teach the concepts of numbers or of addition and subtraction by playing board games. As the children get older, the teachers use more sophisticated materials, such as science apparatus, cameras, or computers.

To encourage collaboration in solving problems, students are increasingly working in groups to discuss and solve problems together. Preparing students for the future workforce is the major stimulus generating the changes in education. To be prepared, students must be able to interact with others, adapt to new technology, and think through problems logically. Teachers provide the tools and the environment for their students to develop these skills.

Preschool, kindergarten, and elementary school teachers play a vital role in the development of children. What children learn and experience during their early years can shape their views of themselves and the world and can affect their later success or failure in school, work, and their personal lives. Preschool, kindergarten, and elementary school teachers introduce children to mathematics, language, science, and social studies. They use games, music, artwork, films, books, computers, and other tools to teach basic skills.

Preschool children learn mainly through play and interactive activities. *Preschool teachers* capitalize on children's play to further language and vocabulary development (using storytelling, rhyming games, and acting games), improve social skills (having the children work together to build a neighborhood in a sandbox), and introduce scientific and mathematical concepts (showing the children how to balance and count blocks when building a bridge or how to mix colors when painting). Thus, a less structured approach, including small-group lessons, one-on-one instruction, and learning through creative activities such as art, dance, and music, is adopted to teach preschool children. Play and hands-on teaching also are used in kindergarten classrooms, but there academics begin to take priority. Letter recognition, phonics, numbers, and awareness of nature and science, introduced at the preschool level, are taught primarily by *kindergarten teachers*.

Most *elementary school teachers* instruct one class of children in several subjects. In some schools, two or more teachers work as a team and are jointly responsible for a group of students

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in at least one subject. In other schools, a teacher may teach one special subject—usually music, art, reading, science, arithmetic, or physical education—to a number of classes. A small but growing number of teachers instruct multilevel classrooms, with students at several different learning levels.

*Middle school teachers* and *secondary school teachers* help students delve more deeply into subjects introduced in elementary school and expose them to more information about the world. Middle and secondary school teachers specialize in a specific subject, such as English, Spanish, mathematics, history, or biology. They also can teach subjects that are career oriented.

*Vocational education teachers*, also referred to as career and technical or career-technology teachers, instruct and train students to work in a wide variety of fields, such as healthcare, business, auto repair, communications, and, increasingly, technology. They often teach courses that are in high demand by area employers, who may provide input into the curriculum and offer internships to students. Many vocational teachers play an active role in building and overseeing these partnerships. Additional responsibilities of middle and secondary school teachers may include career guidance and job placement, as well as followups with students after graduation. (Special education teachers—who instruct elementary and secondary school students who have a variety of disabilities—are discussed separately in this section of the *Handbook*.)

Teachers may use films, slides, overhead projectors, and the latest technology in teaching, including computers, telecommunication systems, and video discs. The use of computer resources, such as educational software and the Internet, exposes students to a vast range of experiences and promotes interactive learning. Through the Internet, students can communicate with students in other countries. Students also use the Internet for individual research projects and to gather information. Computers are used in other classroom activities as well, from solving math problems to learning English as a second language. Teachers also may use computers to record grades and perform other administrative and clerical duties. They must continually update their skills so that they can instruct and use the latest technology in the classroom.

Teachers often work with students from varied ethnic, racial, and religious backgrounds. With growing minority populations in most parts of the country, it is important for teachers to work effectively with a diverse student population. Accordingly, some schools offer training to help teachers enhance their awareness and understanding of different cultures. Teachers may also include multicultural programming in their lesson plans, to address the needs of all students, regardless of their cultural background.

Teachers design classroom presentations to meet students' needs and abilities. They also work with students individually. Teachers plan, evaluate, and assign lessons; prepare, administer, and grade tests; listen to oral presentations; and maintain classroom discipline. They observe and evaluate a student's performance and potential and increasingly are asked to use new assessment methods. For example, teachers may examine a portfolio of a student's artwork or writing in order to judge the student's overall progress. They then can provide additional assistance in areas in which a student needs help. Teachers also grade papers, prepare report cards, and meet with parents and school staff to discuss a student's academic progress or personal problems.

In addition to conducting classroom activities, teachers oversee study halls and homerooms, supervise extracurricular activities, and accompany students on field trips. They may identify students with physical or mental problems and refer the students to the proper authorities. Secondary school teachers occasionally assist students in choosing courses, colleges, and careers. Teachers also participate in education conferences and workshops.

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In recent years, site-based management, which allows teachers and parents to participate actively in management decisions regarding school operations, has gained popularity. In many schools, teachers are increasingly involved in making decisions regarding the budget, personnel, textbooks, curriculum design, and teaching methods.

## Working Conditions

Seeing students develop new skills and gain an appreciation of knowledge and learning can be very rewarding. However, teaching may be frustrating when one is dealing with unmotivated or disrespectful students. Occasionally, teachers must cope with unruly behavior and violence in the schools. Teachers may experience stress in dealing with large classes, students from disadvantaged or multicultural backgrounds, or heavy workloads. Inner-city schools in particular, may be run down and lack the amenities of schools in wealthier communities. Accountability standards also may increase stress levels, with teachers expected to produce students who are able to exhibit satisfactory performance on standardized tests in core subjects.

Teachers are sometimes isolated from their colleagues because they work alone in a classroom of students. However, some schools allow teachers to work in teams and with mentors to enhance their professional development.

Including school duties performed outside the classroom, many teachers work more than 40 hours a week. Part-time schedules are more common among preschool and kindergarten teachers. Although some school districts have gone to all-day kindergartens, most kindergarten teachers still teach two kindergarten classes a day. Most teachers work the traditional 10-month school year with a 2-month vacation during the summer. During the vacation break, those on the 10-month schedule may teach in summer sessions, take other jobs, travel, or pursue personal interests. Many enroll in college courses or workshops to continue their education. Teachers in districts with a year-round schedule typically work 8 weeks, are on vacation for 1 week, and have a 5-week midwinter break. Preschool teachers working in daycare settings often work year round.

Most States have tenure laws that prevent teachers from being fired without just cause and due process. Teachers may obtain tenure after they have satisfactorily completed a probationary period of teaching, normally 3 years. Tenure does not absolutely guarantee a job, but it does provide some security.

## Employment

Preschool, kindergarten, elementary school, middle school, and secondary school teachers, except special education, held about 3.8 million jobs in 2002. Of the teachers in those jobs, about 1.5 million were elementary school teachers, 1.1 million were secondary school teachers, 602,000 were middle school teachers, 424,000 were preschool teachers, and 168,000 were kindergarten teachers. The majority of kindergarten, elementary school, middle school, and secondary school teachers, except special education worked in local government educational services. About 10 percent worked for private schools. Preschool teachers, except special education were most often employed in child daycare services (63 percent), religious organizations (9 percent), local government educational services (9 percent), and private educational services (7 percent). Employment of teachers is geographically distributed much the same as the population is.

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## Training, Other Qualifications, and Advancement

All 50 States and the District of Columbia require public school teachers to be licensed. Licensure is not required for teachers in private schools. Usually licensure is granted by the State Board of Education or a licensure advisory committee. Teachers may be licensed to teach the early childhood grades (usually preschool through grade 3); the elementary grades (grades 1 through 6 or 8); the middle grades (grades 5 through 8); a secondary-education subject area (usually grades 7 through 12); or a special subject, such as reading or music (usually grades kindergarten through 12).

Requirements for regular licenses to teach kindergarten through grade 12 vary by State. However, all States require general education teachers to have a bachelor's degree and to have completed an approved teacher training program with a prescribed number of subject and education credits, as well as supervised practice teaching. Some States also require technology training and the attainment of a minimum grade point average. A number of States require that teachers obtain a master's degree in education within a specified period after they begin teaching.

Almost all States require applicants for a teacher's license to be tested for competency in basic skills, such as reading and writing, and in teaching. Almost all also require the teacher to exhibit proficiency in his or her subject. Nowadays, school systems are moving toward implementing performance-based systems for licensure, which usually require the teacher to demonstrate satisfactory teaching performance over an extended period in order to obtain a provisional license, in addition to passing an examination in one's subject. Most States require continuing education for renewal of the teacher's license. Many States have reciprocity agreements that make it easier for teachers licensed in one State to become licensed in another.

Many States offer alternative licensure programs for teachers who have bachelor's degrees in the subject they will teach, but who lack the necessary education courses required for a regular license. Alternative licensure programs originally were designed to ease shortages of teachers of certain subjects, such as mathematics and science. The programs have expanded to attract other people into teaching, including recent college graduates and those changing from another career to teaching. In some programs, individuals begin teaching quickly under provisional licensure. After working under the close supervision of experienced educators for 1 or 2 years while taking education courses outside school hours, they receive regular licensure if they have progressed satisfactorily. In other programs, college graduates who do not meet licensure requirements take only those courses that they lack and then become licensed. This approach may take 1 or 2 semesters of full-time study. States may issue emergency licenses to individuals who do not meet the requirements for a regular license when schools cannot attract enough qualified teachers to fill positions. Teachers who need to be licensed may enter programs that grant a master's degree in education, as well as a license.

In many States, vocational teachers have many of the same requirements for teaching as their academic counterparts. However, because knowledge and experience in a particular field are important criteria for the job, some States will license vocational education teachers without a bachelor's degree, provided they can demonstrate expertise in their field. A minimum number of hours in education courses may also be required.

Licensing requirements for preschool teachers also vary by State. Requirements for public preschool teachers are generally higher than those for private preschool teachers. Some States require a bachelor's degree in early childhood education, others require an associate's degree, and still others require certification by a nationally recognized authority. The Child Development

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Associate (CDA) credential, the most common type of certification, requires a mix of classroom training and experience working with children, along with an independent assessment of an individual's competence.

In some cases, teachers of kindergarten through high school may attain professional certification in order to demonstrate competency beyond that required for a license. The National Board for Professional Teaching Standards offers a voluntary national certification. To become nationally accredited, experienced teachers must prove their aptitude by compiling a portfolio showing their work in the classroom and by passing a written assessment and evaluation of their teaching knowledge. Currently, teachers may become certified in a variety of areas, on the basis of the age of the students and, in some cases, the subject taught. For example, teachers may obtain a certificate for teaching English language arts to early adolescents (aged 11 to 15), or they may become certified as early childhood generalists. All States recognize national certification, and many States and school districts provide special benefits to teachers holding such certification. Benefits typically include higher salaries and reimbursement for continuing education and certification fees. In addition, many States allow nationally certified teachers to carry a license from one State to another.

The National Council for Accreditation of Teacher Education currently accredits more than 550 teacher education programs across the United States. Generally, 4-year colleges require students to wait until their sophomore year before applying for admission to teacher education programs. Traditional education programs for kindergarten and elementary school teachers include courses—designed specifically for those preparing to teach—in mathematics, physical science, social science, music, art, and literature, as well as prescribed professional education courses, such as philosophy of education, psychology of learning, and teaching methods. Aspiring secondary school teachers most often major in the subject they plan to teach while also taking a program of study in teacher preparation. Teacher education programs are now required to include classes in the use of computers and other technologies in order to maintain their accreditation. Most programs require students to perform a student-teaching internship.

Many States now offer professional development schools—partnerships between universities and elementary or secondary schools. Students enter these 1-year programs after completion of their bachelor's degree. Professional development schools merge theory with practice and allow the student to experience a year of teaching firsthand, under professional guidance.

In addition to being knowledgeable in their subject, teachers must have the ability to communicate, inspire trust and confidence, and motivate students, as well as understand the students' educational and emotional needs. Teachers must be able to recognize and respond to individual and cultural differences in students and employ different teaching methods that will result in higher student achievement. They should be organized, dependable, patient, and creative. Teachers also must be able to work cooperatively and communicate effectively with other teachers, support staff, parents, and members of the community.

With additional preparation, teachers may move into positions as school librarians, reading specialists, curriculum specialists, or guidance counselors. Teachers may become administrators or supervisors, although the number of these positions is limited and competition can be intense. In some systems, highly qualified, experienced teachers can become senior or mentor teachers, with higher pay and additional responsibilities. They guide and assist less experienced teachers while keeping most of their own teaching responsibilities. Preschool teachers usually work their way up from assistant teacher, to teacher, to lead teacher—who may be responsible for the instruction of several classes—and, finally, to director of the center. Preschool teachers with a

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bachelor's degree frequently are qualified to teach kindergarten through grade 3 as well. Teaching at these higher grades often results in higher pay.

## Job Outlook

Job opportunities for teachers over the next 10 years will vary from good to excellent, depending on the locality, grade level, and subject taught. Most job openings will be attributable to the expected retirement of a large number of teachers. In addition, relatively high rates of turnover, especially among beginning teachers employed in poor, urban schools, also will lead to numerous job openings for teachers. Competition for qualified teachers among some localities will likely continue, with schools luring teachers from other States and districts with bonuses and higher pay.

Through 2012, overall student enrollments, a key factor in the demand for teachers, are expected to rise more slowly than in the past. As the children of the baby-boom generation get older, smaller numbers of young children will enter school behind them, resulting in average employment growth for all teachers, from preschool through secondary grades. Projected enrollments will vary by region. Fast-growing States in the South and West—particularly California, Texas, Georgia, Idaho, Hawaii, Alaska, and New Mexico—will experience the largest enrollment increases. Enrollments in the Northeast and Midwest are expected to hold relatively steady or decline. The job market for teachers also continues to vary by school location and by subject taught. Many inner cities—often characterized by overcrowded, ill-equipped schools and higher-than-average poverty rates—and rural areas—characterized by their remote location and relatively low salaries—have difficulty attracting and retaining enough teachers, so job prospects should be better in these areas than in suburban districts. Currently, many school districts have difficulty hiring qualified teachers in some subject areas—mathematics, science (especially chemistry and physics), bilingual education, and foreign languages. Qualified vocational teachers, at both the middle school and secondary school levels, also are currently in demand in a variety of fields. Specialties that have an adequate number of qualified teachers include general elementary education, physical education, and social studies. Teachers who are geographically mobile and who obtain licensure in more than one subject should have a distinct advantage in finding a job. Increasing enrollments of minorities, coupled with a shortage of minority teachers, should cause efforts to recruit minority teachers to intensify. Also, the number of non-English-speaking students has grown dramatically, creating demand for bilingual teachers and for those who teach English as a second language. The number of teachers employed is dependent as well on State and local expenditures for education and on the enactment of legislation to increase the quality of education. A number of initiatives, such as reduced class size (primarily in the early elementary grades), mandatory preschool for 4-year-olds, and all-day kindergarten, have been implemented in a few States, but not nationwide. Additional teachers—particularly preschool and early elementary school teachers—will be needed if States or localities implement any of these measures. At the Federal level, legislation that is likely to affect teachers recently was put into place with the enactment of the No Child Left Behind Act. Although the full impact of this act is not yet known, its emphasis on ensuring that all schools hire and retain only qualified teachers, may lead to an increase in funding for schools that currently lack such teachers.

The supply of teachers is expected to increase in response to reports of improved job prospects, better pay, more teacher involvement in school policy, and greater public interest in education. In recent years, the total number of bachelor's and master's degrees granted in education has increased steadily. Because of a shortage of teachers in certain locations, and in anticipation of the loss of a number of teachers to retirement, many States have implemented policies that will encourage more students to become teachers. In addition, more teachers may be drawn from a

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reserve pool of career changers, substitute teachers, and teachers completing alternative certification programs.

## Earnings

Median annual earnings of kindergarten, elementary, middle, and secondary school teachers ranged from \$39,810 to \$44,340 in 2002; the lowest 10 percent earned \$24,960 to \$29,850; the top 10 percent earned \$62,890 to \$68,530. Median earnings for preschool teachers were \$19,270.

According to the American Federation of Teachers, beginning teachers with a bachelor's degree earned an average of \$30,719 in the 2001–02 school year. The estimated average salary of all public elementary and secondary school teachers in the 2001–02 school year was \$44,367. Private school teachers generally earn less than public school teachers.

In 2002, more than half of all elementary, middle, and secondary school teachers belonged to unions—mainly the American Federation of Teachers and the National Education Association—that bargain with school systems over wages, hours, and other terms and conditions of employment. Fewer preschool and kindergarten teachers were union members—about 15 percent in 2002.

Teachers can boost their salary in a number of ways. In some schools, teachers receive extra pay for coaching sports and working with students in extracurricular activities. Getting a master's degree or national certification often results in a raise in pay, as does acting as a mentor. Some teachers earn extra income during the summer by teaching summer school or performing other jobs in the school system.

Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*, Teachers—Preschool, Kindergarten, Elementary, Middle, and Secondary, on the Internet at <http://www.bls.gov/oco/ocos069.htm>.