

(PET), are extremely costly, and hospitals contemplating them will have to consider equipment costs, reimbursement policies, and the number of potential users.

Earnings

Median annual earnings of nuclear medicine technologists were \$44,130 in 2000. The middle 50 percent earned between \$38,150 and \$52,190. The lowest 10 percent earned less than \$31,910, and the highest 10 percent earned more than \$58,500. Median annual earnings of nuclear medicine technologists in 2000 were \$44,000 in hospitals.

Related Occupations

Nuclear medical technologists operate sophisticated equipment to help physicians and other health practitioners diagnose and treat patients. Cardiovascular technologists and technicians, clinical laboratory technologists and technicians, diagnostic medical sonographers, radiation therapists, radiologic technologists and technicians, and respiratory therapists also perform similar functions.

Sources of Additional Information

Additional information on a career as a nuclear medicine technologist is available from:

► The Society of Nuclear Medicine-Technologist Section, 1850 Samuel Morse Dr., Reston, VA 22090. Internet: <http://www.snm.org>

For career information, send a stamped, self-addressed business size envelope with your request to:

► American Society of Radiologic Technologists, Customer Service Department, 15000 Central Ave. SE., Albuquerque, NM 87123-3917, or call (800) 444-2778. Internet: <http://www.asrt.org/asrt.htm>

For a list of accredited programs in nuclear medicine technology, write to:

► Joint Review Committee on Educational Programs in Nuclear Medicine Technology, PMB 418, 1 2nd Avenue East, Suite C, Polson, MT 59860-2107. Internet: <http://www.jrcnmt.org>

Information on certification is available from:

► American Registry of Radiologic Technologists, 1255 Northland Dr., St. Paul, MN 55120-1155. Internet: <http://www.arrt.org>

► Nuclear Medicine Technology Certification Board, 2970 Clairmont Rd., Suite 610, Atlanta, GA 30329. Internet: <http://www.nmtcb.org>

Occupational Health and Safety Specialists and Technicians

(O*NET 29-9011.00, 29-9012.00)

Significant Points

- Almost half of occupational health and safety specialists and technicians work in Federal, State, and local government agencies that enforce rules on health and safety.
- For positions as specialists, many employers, including the Federal Government, require 4-year college degrees in safety or a related field.

Nature of the Work

Occupational health and safety specialists and technicians, also known as *occupational health and safety inspectors* and *industrial hygienists*, help keep workplaces safe and workers unscathed. They promote occupational health and safety within organizations by developing safer, healthier, and more efficient ways of working.

(Industrial engineers, including health and safety—who have similar goals—are discussed elsewhere in the *Handbook*.) *Occupational health and safety specialists* analyze work environments and design programs to control, eliminate, and prevent disease or injury caused by chemical, physical, and biological agents or ergonomic factors. They may conduct inspections and enforce adherence to laws, regulations, or employer policies governing worker health and safety. *Occupational health and safety technicians* collect data on work environments for analysis by occupational health and safety specialists. Usually working under the supervision of specialists, they help implement and evaluate programs designed to limit risks to workers.

Occupational health and safety specialists and technicians identify hazardous conditions and practices. Sometimes, they develop methods to predict hazards from experience, historical data, and other information sources. Then they identify potential hazards in existing or future systems, equipment, products, facilities, or processes. After reviewing the causes or effects of hazards, they evaluate the probability and severity of accidents that may result. For example, they might uncover patterns in injury data that implicate a specific cause such as system failure, human error, incomplete or faulty decision making, or a weakness in existing policies or practices. Then they develop and help enforce a plan to eliminate hazards, conducting training sessions for management, supervisors, and workers on health and safety practices and regulations, as necessary. Lastly, they may check on the progress of the safety plan after its implementation. If improvements are not satisfactory, a new plan might be designed and put into practice.

Many occupational health and safety specialists inspect and test machinery and equipment, such as lifting devices, machine shields, or scaffolding, to ensure they meet appropriate safety regulations. They may check that personal protective equipment, such as masks, respirators, safety glasses, or safety helmets, is being used in workplaces according to regulations. They also check that dangerous materials are stored correctly. They test and identify work areas for potential accident and health hazards, such as toxic fumes and explosive gas-air mixtures, and may implement appropriate control measures, such as adjustments to ventilation systems. Their investigations might involve talking with workers and observing their work, as well as inspecting elements in their work environment, such as lighting, tools, and equipment.

To measure and control hazardous substances, such as the noise or radiation levels, occupational health and safety specialists and technicians prepare and calibrate scientific equipment. Samples of



Almost half of occupational health and safety specialists and technicians work for Federal, State, or local government agencies.

dust, gases, vapors, and other potentially toxic materials must be collected and handled properly to ensure safety and accurate test results.

If an accident occurs, occupational health and safety specialists help investigate unsafe working conditions, study possible causes, and recommend remedial action. Some occupational health and safety specialists and technicians assist with the rehabilitation of workers after accidents and injuries, and make sure they return to work successfully.

Frequent communication with management may be necessary to report on the status of occupational health and safety programs. Consultation with engineers or physicians also may be required.

Occupational health and safety specialists prepare reports including observations, analysis of contaminants, and recommendation for control and correction of hazards. Those who develop expertise in certain areas may develop occupational health and safety systems, including policies, procedures, and manuals.

Working Conditions

Occupational health and safety specialists and technicians work with many different people in a variety of environments. Their jobs often involve considerable fieldwork, and some travel frequently. Many occupational health and safety specialists and technicians work long and often irregular hours.

Occupational health and safety specialists and technicians may experience unpleasant, stressful, and dangerous working conditions. For example, health and safety inspectors are exposed to many of the same physically strenuous conditions and hazards as industrial employees, and the work may be performed in unpleasant, stressful, and dangerous working conditions. Health and safety inspectors may find themselves in adversarial roles when the organization or individual being inspected objects to the process or its consequences.

Employment

Occupational health and safety specialists and technicians held about 35,000 jobs in 2000. The Federal Government—chiefly the Department of Labor—employed 8 percent, State governments employed 17 percent, and local governments employed 19 percent. The remainder were employed throughout the private sector in schools, hospitals, management consulting firms, public utilities, and manufacturing firms.

Within the Federal government, most jobs are as Occupational Health and Safety Administration (OSHA) inspectors, who enforce U.S. Department of Labor regulations that ensure adequate safety principles, practices, and techniques are applied in workplaces. Employers may be fined for violation of OSHA standards. Within the U.S. Department of Health and Human Services, occupational health and safety specialists working for the National Institute of Occupational Safety and Health (NIOSH) provide private companies with an avenue to evaluate the health and safety of their employees without the risk of being fined. Most large government agencies also employ occupational health and safety specialists and technicians who work to protect agency employees.

Most private companies either employ their own safety personnel or contract safety professionals to ensure OSHA compliance, as needed.

Training, Other Qualifications, and Advancement

Requirements include a combination of education, experience, and passing scores on written examinations. Many employers, including the Federal Government, require a 4-year college degree in safety or a related field for some positions. Experience as a safety professional is also a prerequisite for many positions.

All occupational health and safety specialists and technicians are trained in the applicable laws or inspection procedures through some combination of classroom and on-the-job training. In general, people who want to enter this occupation should be responsible and like detailed work. Occupational health and safety specialists and technicians should be able to communicate well. Recommended high school courses include English, chemistry, biology, and physics.

Certification is available through the Board of Certified Safety Professionals (BCSP) and the American Board of Industrial Hygiene (ABIH). The BCSP offers the Certified Safety Professional (CSP) credential, while the ABIH proffers the Certified Industrial Hygienist (CIH) credential. Also, the Council on Certification of Health, Environmental, and Safety Technologists, a joint effort between the BCSP and ABIH, awards the Occupational Health and Safety Technologist (OHST) credential. Requirements for the OHST credential are less stringent than those for the CSP or CIH credentials. Once education and experience requirements have been met, certification may be obtained through an examination. Continuing education is required for recertification. Although voluntary, many employers encourage certification.

Federal Government occupational health and safety specialists and technicians whose job performance is satisfactory advance through their career ladder to a specified full-performance level. For positions above this level, usually supervisory positions, advancement is competitive and based on agency needs and individual merit. Advancement opportunities in State and local governments and the private sector are often similar to those in the Federal Government.

With additional experience or education, promotion to a managerial position is possible. Research or related teaching positions at the college level require advanced education.

Job Outlook

Employment of occupational health and safety specialists and technicians is expected to grow about as fast as the average for all occupations through 2010, reflecting a balance of continuing public demand for a safe and healthy work environment against the desire for smaller government and fewer regulations. Additional job openings will arise from the need to replace those who transfer to other occupations, retire, or leave the labor force for other reasons. In private industry, employment growth will reflect industry growth and the continuing self-enforcement of government and company regulations and policies.

Employment of occupational health and safety specialists and technicians is seldom affected by general economic fluctuations. Federal, State, and local governments, which employ almost half of all specialists and technicians, provide considerable job security.

Earnings

Median annual earnings of occupational health and safety specialists and technicians were \$42,750 in 2000. The middle 50 percent earned between \$32,060 and \$54,880. The lowest 10 percent earned less than \$23,780, while the highest 10 percent earned over \$67,760. Median annual earnings of occupational health and safety specialists and technicians in 2000 were \$41,330 in local government and \$41,110 in State government.

Most occupational health and safety specialists and technicians work for Federal, State, and local governments or in large private firms, most of which generally offer more generous benefits than do smaller firms.

Related Occupations

Occupational health and safety specialists and technicians ensure that laws and regulations are obeyed. Others who enforce laws and regulations include agricultural inspectors, construction and building inspectors, correctional officers, financial examiners, fire inspectors, police and detectives, and transportation inspectors.

Sources of Additional Information

Information about jobs in Federal, State, and local government as well as in private industry is available from the States' employment service offices.

For information on a career as an industrial hygienist and a list of colleges and universities offering programs in industrial hygiene, contact:

► American Industrial Hygiene Association, 2700 Prosperity Ave., Suite 250, Fairfax, VA 22031. Internet: <http://www.aiha.org>

For a list of colleges and universities offering safety and related degrees, including correspondence courses, contact:

► American Society of Safety Engineers, 1800 E Oakton St., Des Plaines, IL 60018. Internet: <http://www.asse.org>

For information on the Certified Safety Professional credential, contact:

► Board of Certified Safety Professionals, 208 Burwash Ave., Savoy, IL 61874. Internet: <http://www.bcsp.org>

For information on the Certified Industrial Hygiene credential, contact:

► American Board of Industrial Hygiene, 6015 West St. Joseph, Suite 102, Lansing, MI 48917. Internet: <http://www.abih.org>

For information on the Occupational Health and Safety Technologist credential, contact:

► Council on Certification of Health, Environmental, and Safety Technologists, 208 Burwash Ave., Savoy, IL 61874. Internet:

<http://www.cchest.org>

For additional career information, contact:

► U.S. Department of Health and Human Services, Center for Disease Control and Prevention, National Institute of Occupational Safety and Health, Hubert H. Humphrey Bldg., 200 Independence Ave. SW., Room 715H, Washington, DC 20201. Internet: <http://www.cdc.gov/niosh/homepage.html>

► U.S. Department of Labor, Occupational Safety and Health Administration, 200 Constitution Ave. NW., Washington, DC 20210. Internet:

<http://www.osha.gov>

Information on obtaining positions as occupational health and safety specialists and technicians with the Federal Government is available from the Office of Personnel Management through a telephone-based system. Consult your telephone directory under U.S. Government for a local number or call (912) 757-3000; Federal Relay Service: (800) 877-8339. The first number is not tollfree, and charges may result. Information also is available from the Internet site: <http://www.usajobs.opm.gov>.

Opticians, Dispensing

(O*NET 29-2081.00)

Significant Points

- Most dispensing opticians receive training on-the-job or through apprenticeships lasting 2 or more years; 22 States require a license.
- Projected employment growth reflects steadfast demand for corrective lenses and trends in fashion.
- The number of job openings will be relatively small because the occupation is small.

Nature of Work

Dispensing opticians fit eyeglasses and contact lenses, following prescriptions written by ophthalmologists or optometrists. (The work of optometrists is described in a statement elsewhere in the *Handbook*. See the statement on physicians and surgeons for information about ophthalmologists.)

Dispensing opticians examine written prescriptions to determine lens specifications. They recommend eyeglass frames, lenses, and lens coatings after considering the prescription and the customer's occupation, habits, and facial features. Dispensing opticians measure clients' eyes, including the distance between the centers of the pupils and the distance between the eye surface and the lens. For customers without prescriptions, dispensing opticians may use a lensometer to record the present eyeglass prescription. They also may obtain a customer's previous record, or verify a prescription with the examining optometrist or ophthalmologist.

Dispensing opticians prepare work orders that give ophthalmic laboratory technicians information needed to grind and insert lenses into a frame. The work order includes lens prescriptions and information on lens size, material, color, and style. Some dispensing opticians grind and insert lenses themselves. After the glasses are made, dispensing opticians verify that the lenses have been ground to specifications. Then they may reshape or bend the frame, by hand or using pliers, so that the eyeglasses fit the customer properly and comfortably. Some also fix, adjust, and refit broken frames. They instruct clients about adapting to, wearing, or caring for eyeglasses.

Some dispensing opticians specialize in fitting contacts, artificial eyes, or cosmetic shells to cover blemished eyes. To fit contact lenses, dispensing opticians measure eye shape and size, select the type of contact lens material, and prepare work orders specifying the prescription and lens size. Fitting contact lenses requires considerable skill, care, and patience. Dispensing opticians observe customers' eyes, corneas, lids, and contact lenses with special instruments and microscopes. During several visits, opticians show customers how to insert, remove, and care for their contacts, and ensure the fit is correct.

Dispensing opticians keep records on customer prescriptions, work orders, and payments; track inventory and sales; and perform other administrative duties.

Working Conditions

Dispensing opticians work indoors in attractive, well-lit, and well-ventilated surroundings. They may work in medical offices or small stores where customers are served one at a time, or in large



A dispensing optician ensures that eyeglass frames fit properly and comfortably.