

# Pharmacy

Includes:

- Pharmacist
- Pharmacy technician

## Pharmacist

Pharmacists play a key role in the health care system through the medicine and information they provide. Although responsibilities vary among the different areas of pharmacy practice, the bottom line is that pharmacists help patients get well. Pharmacists are drug experts ultimately concerned about their patients' health and wellness.

The number of people requiring health care services has steadily increased, and this trend will likely continue. Due to many of society's changing social and health issues, pharmacists will face new challenges, including:

- Increases in average life span and the increased incidence of chronic diseases
- Increased complexity, number, and sophistication of medications and related products and devices
- Increased emphasis on primary and preventive health services, home health care, and long-term care

### Career Description

Pharmacists provide information to patients about medications and their use and distribute drugs prescribed by physicians and other health practitioners. They advise physicians and other health practitioners on the selection, dosages, interactions, and side effects of medications. Pharmacists also monitor the health and progress of patients in response to drug therapy to ensure the safe and effective use of medication. Pharmacists must understand the use, clinical effects, and composition of drugs, including their chemical, biological, and physical properties.

Compounding—the actual mixing of ingredients to form powders, tablets, capsules, ointments, and solutions—is a small part of a pharmacist's practice, because most medicines are produced by pharmaceutical companies in a standard dosage and drug delivery form.

About 65 percent of the nation's 269,000 pharmacists work in a community setting, such as a retail drugstore; about 22 percent work in a health care facility, such as a hospital, nursing home, mental health institution, or neighborhood health clinic.

Pharmacists in community and retail pharmacies counsel patients and answer questions about prescription drugs, including questions regarding possible side effects or interactions among various drugs. They provide information about over-the-counter drugs and make recommendations after talking with the patient. They also may give advice about the patient's diet, exercise, or stress management or about durable medical equipment and home health care supplies. In addition, they also may complete third-party insurance forms and other paperwork. Those who own or manage community pharmacies may sell non-health-related merchandise, hire and supervise personnel, and oversee the general operation of the pharmacy. Some community pharmacists provide specialized services to help patients manage conditions such as diabetes, asthma, smoking cessation, or high blood pressure. Most community pharmacists also are trained to administer vaccinations.

Pharmacists in health care facilities dispense medications and advise the medical staff on the selection and effects of drugs. They may make sterile solutions to be administered intravenously. They also assess, plan, and monitor drug programs or regimens. Pharmacists counsel hospitalized patients on the use of drugs and on their use at home when the patients are discharged. Pharmacists also may evaluate drug-use patterns and outcomes for patients in hospitals or managed care organizations.

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

Some pharmacists specialize in specific drug therapy areas, such as intravenous nutrition support, oncology (cancer), nuclear pharmacy (used for chemotherapy), geriatric pharmacy, and psychopharmacotherapy (the treatment of mental disorders by means of drugs).

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

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

### Employment Characteristics

Pharmacists work in clean, well-lighted, and well-ventilated areas. Many pharmacists spend most of their workday on their feet. When working with sterile or dangerous pharmaceutical products, pharmacists wear gloves and masks and work with other special protective equipment. Many community and hospital pharmacies are open for extended hours or around the clock, so pharmacists may work nights, weekends, and holidays. Consultant pharmacists may travel to nursing homes or other facilities to monitor patients' drug therapy.

About 19 percent of pharmacists worked part time in 2008. Most full-time salaried pharmacists worked approximately 40 hours a week. Some, including many self-employed pharmacists, worked more than 50 hours a week.

### **Salary**

According to a 2009 survey by *Drug Topics* magazine, the median annual earning of pharmacists was \$112,135 in 2008, \$107,403 in 2007, and \$94,927 in 2006, as compared to \$89,723 in 2004, \$82,607 in 2002, \$78,624 in 2000 and \$64,980 in 1999. Data from the US Bureau of Labor Statistics from May 2009 show that wages at the 10th percentile are \$79,270, the 50th percentile (median) at \$109,180, and the 90th percentile at \$134,290 ([www.bls.gov/oes/current/oes291051.htm](http://www.bls.gov/oes/current/oes291051.htm)).

For more information, refer to [www.ama-assn.org/go/hpsalary](http://www.ama-assn.org/go/hpsalary).

### **Employment Outlook**

A shortfall of as many as 157,000 pharmacists is predicted by 2020, according to the findings of a conference sponsored by the Pharmacy Manpower Project, as detailed in *Professionally Determined Need for Pharmacy Services in 2020*. Similarly, a report of the Health Resources and Services Administration of the Department of Health and Human Services, *The Pharmacy Workforce: A Study of the Supply and Demand for Pharmacists*, concludes that the increasing demand for pharmacists' services is outpacing the current and possibly future pharmacist supply.

Accordingly, very good employment opportunities are expected for pharmacists through 2018 because the number of job openings created by employment growth and the need to replace pharmacists who leave the occupation or retire are expected to exceed the number of degrees granted in pharmacy. Enrollments in pharmacy programs are rising as more students are attracted by high salaries and good job prospects. Despite this increase in enrollments, job openings should still be more numerous than those seeking employment.

Employment of pharmacists is expected to grow by 17 percent between 2008 and 2018, which is faster than the average for all occupations. The increasing numbers of middle-aged and elderly people—who use more prescription drugs than younger people—will continue to spur demand for pharmacists throughout the projection period. In addition, as scientific advances lead to new drug products, and as an increasing number of people obtain prescription drug coverage, the need for these workers will continue to expand.

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

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

Employment of pharmacists will not grow as fast in hospitals as in other industries, because hospitals are reducing inpatient stays, downsizing, and consolidating departments. The number of outpatient surgeries is increasing, so more patients are being discharged and purchasing their medications through retail, supermarket, or mail-order pharmacies, rather than through hospitals. An aging population means that more pharmacy services will be required in nursing homes, assisted-living facilities, and home care settings. The most rapid job growth among pharmacists is expected in these 3 settings.

New opportunities are emerging for pharmacists in managed care organizations where they analyze trends and patterns in medication use, and in pharmacoeconomics—the cost and benefit analysis of different drug therapies. Opportunities also are emerging for pharmacists trained in research and disease management—the development of new methods for curing and controlling diseases. Pharmacists also are finding jobs in research and development and in sales and marketing for pharmaceutical manufacturing firms. New breakthroughs in biotechnology will increase the potential for drugs to treat diseases and expand the opportunities for pharmacists to conduct research and sell medications. In addition, pharmacists are finding employment opportunities in pharmacy informatics, which uses information technology to improve patient care.

### **Educational Programs**

**Award, Length.** The Doctor of Pharmacy (PharmD) degree requires at least two years of specific preprofessional (undergraduate) course work followed by four academic years (or three calendar years) of professional study. The PharmD degree has replaced the Bachelor of Pharmacy (BPharm) degree, which is no longer being awarded.

**Prerequisites.** Pharmacy colleges and schools may accept students directly from high school for both the prepharmacy and pharmacy curriculum, or after completion of the college course prerequisites. The majority of students enter a pharmacy program with three or more years of college experience. Entry requirements usually include courses in mathematics and natural sciences, such as chemistry, biology, and physics, as well as courses in the humanities and social sciences. Approximately two thirds of all colleges require applicants to take the Pharmacy College Admissions

Test (PCAT).

Prospective pharmacists should have scientific aptitude, good communication skills, and a desire to help others. They also must be conscientious and pay close attention to detail, because the decisions they make affect human lives, and possess high ethical and professional standards. Other character traits of successful pharmacists include curiosity and desire and willingness to learn. Most importantly, pharmacists must enjoy working with people, be comfortable meeting them, and be willing to serve them in a variety of circumstances.

**Curriculum.** Student pharmacists learn about all aspects of drug therapy as well as how to communicate with patients and other health care providers about drug information and patient care. Other courses focus on professional ethics, public health, and developing and managing medication distribution systems. In addition to classroom instruction, students in PharmD programs spend about one fourth of their time learning in a variety of pharmacy practice settings under the supervision of licensed pharmacists.

**Advanced Training.** For individuals who want more laboratory and research experience, many colleges of pharmacy offer an MS or PhD degree after completion of the PharmD degree. Many master's and PhD degree holders do research for drug companies or teach at universities.

Other options for pharmacy graduates who are interested in further training include one-year or two-year residency programs or fellowships. Pharmacy residencies are postgraduate training programs in pharmacy practice and usually require the completion of a research study. There currently are more than 700 residency programs nationwide.

Pharmacy fellowships are highly individualized programs that are designed to prepare participants to work in a specialized area of pharmacy, such as clinical practice or research laboratories. Some pharmacists who run their own pharmacy obtain a master's degree in business administration (MBA). Others may obtain a degree in public administration or public health.

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

### **Licensure, Certification, Registration**

A license to practice pharmacy is required in all states, the District of Columbia, and all US territories. To obtain a license, the prospective pharmacist must graduate from a college of pharmacy accredited by the Accreditation Council for Pharmacy Education (ACPE) and pass an examination. All states require the North American Pharmacist Licensure Exam (NAPLEX), which tests pharmacy skills and knowledge, and 43 states and the District of Columbia require the Multistate Pharmacy Jurisprudence Exam (MPJE), which tests pharmacy law. Both exams are administered by the National Association of Boards of Pharmacy. Pharmacists in the eight states that do not require the MJPE must pass a state-specific exam that is similar to the MJPE. In addition to the NAPLEX and MPJE, some states require additional exams unique to their state. All states except California currently grant a license without extensive reexamination to qualified pharmacists who already are licensed by another state. In Florida, reexamination is not required if a pharmacist has passed the NAPLEX and MPJE within 12 years of applying for a license transfer. Many pharmacists are licensed to practice in more than one state. Most states require continuing education for license renewal.

### **Inquiries**

#### **Education, Careers, Resources**

American Association of Colleges of Pharmacy  
1727 King Street  
Alexandria, VA 22314  
(703) 739-2330, x1024  
[www.aacp.org/pharmacycareers](http://www.aacp.org/pharmacycareers)

American Society of Health-System Pharmacists  
7272 Wisconsin Avenue  
Bethesda, MD 20814  
[www.ashp.org](http://www.ashp.org)

American Pharmacists Association  
2215 Constitution Avenue NW  
Washington, DC 20037-2985  
[www.pharmacist.com/students](http://www.pharmacist.com/students)

#### **Licensure**

National Association of Boards of Pharmacy  
1600 Feehanville Drive  
Mount Prospect, IL 60056  
[www.nabp.net](http://www.nabp.net)

#### **Program Accreditation**

Accreditation Council for Pharmacy Education  
20 North Clark Street, Suite 2500  
Chicago, IL 60602  
[www.acpe-accredit.org](http://www.acpe-accredit.org)

*Note:* Adapted in part from the Bureau of Labor Statistics, US Department of Labor, *Occupational Outlook Handbook*, Pharmacists, at [www.bls.gov/oco/ocos079.htm](http://www.bls.gov/oco/ocos079.htm).