



PHARMACEUTICAL CARE IS AN EVOLUTIONARY AND REVOLUTIONARY WAY OF PRACTISING PHARMACY

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ABSTRACT

Pharmacists, also known as chemists (Commonwealth English) or druggists (North American and archaically, Commonwealth English), are healthcare professionals who practice in pharmacy, the field of health sciences focusing on safe and effective medication use. A pharmacist is a member of the health care team directly involved with patient care. Pharmacists undergo university-level education to understand the biochemical mechanisms and actions of drugs, drug uses, therapeutic roles, side effects, potential drug interactions and monitoring parameters. This is mated to anatomy, physiology and pathophysiology. Pharmacists interpret and communicate this specialized knowledge to patients, physicians and other health care providers. Among other licensing requirements, different countries require pharmacists to hold a Bachelor of Pharmacy (B.Pharm.), Master of Pharmacy (M.Pharm.), or Doctor of Pharmacy (Pharm.D.) degree. The most common pharmacist positions are that of a community pharmacist (also referred to as a retail pharmacist, first-line pharmacist or dispensing chemist), or a hospital pharmacist, where they instruct and counsel on the proper use and adverse effects of medically prescribed drugs and medicines. In most countries, the profession is subject to professional regulation. Depending on the legal scope of practice, pharmacists may contribute to prescribing (also referred to as "pharmacist prescriber") and administering certain medications (e.g., immunizations) in some jurisdictions. Pharmacists may also practice in a variety of other settings, including industry, wholesaling, research, academia, military and government.

KEYWORDS: Pharmacy, Chemist & Druggist, Drug, Medicine, Prescription, Doctor, Drug store, Medical Shop, Pharmacy Practice, Patient care, Documentation, Patient counseling, Pharmacotherapy, Pharmacovigilance.

OATH/PROMISE OF A PHARMACIST

As a pharmacist, I vow to serve humanity and to support my profession's ideals and commitments:

(a) I swear by the code of ethics of Pharmacy Council of India, in relation to the community and shall act as an integral part of health care team (b) I shall uphold the laws and standards governing my profession (c) I shall strive to perfect and enlarge my knowledge to contribute to the advancement of pharmacy and public health (d) I shall follow the system which I consider best for pharmaceutical care and counseling of patients (e) I shall endeavor to discover and manufacture drugs of quality to alleviate sufferings of humanity (f) I shall hold

in confidence the knowledge gained about the patients in connection with my professional practice and never divulge unless compelled to do so by the law (g) I shall associate with organizations having their objectives for betterment of the profession of pharmacy and make contribution to carry out the work of those organizations (h) I shall nurture the preparation of future members of my profession (i) While I continue to keep this oath unviolated may it be granted to me to enjoy life and the practice of pharmacy respected by all, at all times (j) Should I trespass and violate this oath, may the reverse be my lot.



Figure-1: Pharmacy.

In taking this solemn oath/making this promise, I honour those who have supported my development as a pharmacist and commit myself never to act in a manner that is contrary to these vows.^[1]

INTRODUCTION

Pharmacists are health professionals who assist individuals in making the best use of medications. This Code, prepared and supported by pharmacists, is intended to state publicly the principles that form the fundamental basis of the roles and responsibilities of pharmacists. These principles, based on moral obligations and virtues, are established to guide pharmacists in relationships with patients, health professionals and society.

I. A pharmacist respects the covenantal relationship between the patient and pharmacist: Considering the patient-pharmacist relationship as a covenant means that a pharmacist has moral obligations in response to the gift of trust received from society. In return for this gift, a pharmacist promises to help individuals achieve optimum benefit from their medications, to be committed to their welfare and to maintain their trust.

II. A pharmacist promotes the good of every patient in a caring, compassionate, and confidential manner: A pharmacist places concern for the well-being of the patient at the center of professional practice. In doing so, a pharmacist considers needs stated by the patient as well as those defined by health science. A pharmacist is dedicated to protecting the dignity of the patient. With a caring attitude and a compassionate spirit, a pharmacist focuses on serving the patient in a private and confidential manner.

III. A pharmacist respects the autonomy and dignity of each patient: A pharmacist promotes the right of self-determination and recognizes individual self-worth by encouraging patients to participate in decisions about

their health. A pharmacist communicates with patients in terms that are understandable. In all cases, a pharmacist respects personal and cultural differences among patients.

IV. A pharmacist acts with honesty and integrity in professional relationships: A pharmacist has a duty to tell the truth and to act with conviction of conscience. A pharmacist avoids discriminatory practices, behavior or work conditions that impair professional judgment and actions that compromise dedication to the best interests of patients.

V. A pharmacist maintains professional competence: A pharmacist has a duty to maintain knowledge and abilities as new medications, devices and technologies become available and as health information advances.

VI. A pharmacist respects the values and abilities of colleagues and other health professionals: When appropriate, a pharmacist asks for the consultation of colleagues or other health professionals or refers the patient. A pharmacist acknowledges that colleagues and other health professionals may differ in the beliefs and values they apply to the care of the patient.

VII. A pharmacist serves individual, community and societal needs: The primary obligation of a pharmacist is to individual patients. However, the obligations of a pharmacist may at times extend beyond the individual to the community and society. In these situations, the pharmacist recognizes the responsibilities that accompany these obligations and acts accordingly.

VIII. A pharmacist seeks justice in the distribution of health resources: When health resources are allocated, a pharmacist is fair and equitable, balancing the needs of patients and society.^[2]



Figure-2: Medical store & Medicines.

Definitions

Chief Pharmacist: A “Pharmacist” as described above, with at least one year experience of providing pharmaceutical care to patients.

Client: All persons who come to the pharmacy for obtaining medicines, cosmetics or other products and services.

Community Pharmacy: The area of pharmacy practice in which medicines and other related products are sold or provided directly to the public from a retail outlet designated primarily for the purpose of providing medicines. The sale or provision of the medicine may either be on the order or prescription of a doctor or “over the counter” by the Pharmacist.

Drug: All chemical or natural substances capable of being used for therapeutic purposes. Drugs are xenobiotics (supplied from outer source) which are active in *in-vivo*. *Xeno* means outer source and *Biotics* means active in biological system. The active pharmaceutical ingredient (API) of drug supplies chemical entities obtained from either natural source or semisynthetic source or synthetic source having perfect structural network having capability to fit on bioreceptor platform having controlling authority to check the biochemical malfunction inside the body which creates.

Specific molecule of drug can interact with receptor molecule which is understood by a pharmacist for the safety purpose of suffering of patient’s ailments after prescribing from doctor.

Medicine: Drugs used for therapeutic purposes in various formulations (tablet, capsule, oral liquid, injection, ointment, suppository, inhalation, parenteral etc). All medicines are drugs but all drugs are not medicines and similarly all drugs are chemicals but all chemicals are not drug.

Patient: A client who is suffering from an ailment and visits the pharmacy to obtain medication or advice. All patients are clients but all clients may not be patients.

Pharmacy Assistant: A person engaged by a Community Pharmacy, who does not have any formal pharmacy qualifications but has received “on the job” or “in house” training.

Pharmaceutical Care: The responsible provision of pharmaco-therapy for the purpose of achieving definite outcomes that improve or maintain a patient’s quality of life. It is a collaborative process that aims to prevent or identify and solve medicinal product and health related problems.



Figure-3: Patient’s healthcare.

Pharmacist: A person with a formal pharmacy qualification such as a degree or diploma in pharmacy

and who is registered with the State Pharmacy Council where he is practicing the profession.

Profession: A vocation that meets the following criteria:

1. A state-enforced monopoly of rendering specialized services to society.
2. A control over length and content of the training that is mandatory for the occupational group.
3. An area of work where the society needs and receives consistently high and ethical standards of service.
4. The practitioners have an accepted and enforced code of ethics.

Qualified Pharmacist: A pharmacist who has adequate qualification(s) that make him/her eligible to get registered.

Registered Pharmacist: A Pharmacist who is registered under the Pharmacy Act with the state pharmacy council where he normally practices.

Trained Pharmacist: A Qualified Pharmacist who has adequate training to deliver Pharmaceutical Care.

The pharmacy should be easily located & identified by the public. Exterior of the pharmacy should be maintained neat and clean. The façade should be clearly marked with the word “PHARMACY” written in English as well as in the local language(s) of the area. As far as possible, the pharmacy should be conveniently assessable to people using prams or wheel chairs etc. pharmaceutical services and products should be served from an area which is separate from the other activities/services and products. This facilitates the integrity & quality of products, and minimizes the risk of dispensing errors. The Pharmacist should be directly & easily accessible to public for information, counseling, etc.

Purpose

- (i) Patients may feel hesitant or uncomfortable to speak out his/her illness/about his medicine to a pharmacist when he feels he could be overheard by others.
- (ii) If the problem/query of the patient needs alone time (10 minutes or more), it needs a place where a patient can sit at ease.
- (iii) Demonstration of certain instruments,/diagnostic kits/self-usable devices (for e.g. Training the patient on making an insulin injection, or demonstrating with the help of charts or video would be better done in a secluded and related place). The pharmacy environment should be clean with minimum dust and should be maintained clean as per pharmacist cleaning schedules and SOPs. It should be free from rodents and pests/insects and pest control measures should be taken from time to time.^[3]

The pharmacy should have a constant supply of energy especially for the refrigerator(s). There should preferably be a provision for drinking water to facilitate drug administration to the patients and for use of the staff. The pharmacy should have a comfortable environment for ease/comfort of clients and personnel.

The pharmacy should have:

(i) Sufficient pace for clients to stand comfortably at the dispensing counter and if possible for some to sit comfortably while they wait.

(ii) Space for patient information displays, including for information leaflets/material.

(iii) A separate enclosure described as “counseling Area” for patient counseling, storage of reference resources (e.g. books, internet access etc.) is a fundamental requirement.

Counseling area should be a place where patients can talk freely with the pharmacist. It should be away from the area otherwise normally accessed by the patients and should preferably be an enclosure with a door which can be closed for further confidentiality. It should be well lighted with comfortable seating for the Pharmacist and the patient/attendant.

(iv) A compounding pharmacy should also have sufficient additional space for making extemporaneous preparations, besides the necessary equipment for doing so.

(v) Separate waste collection baskets/boxes should be available for the staff and for the clients.

The products storage area should be protected from exposure to excessive light and heat. Ambient temperature in the pharmacy should be maintained within the stipulated range to prevent deterioration of various medicines stored at room temperature conditions.



Figure-4: Pharmacy profession.

Furniture and fixtures: The pharmacy should have neat, well placed shelves with provision for storage of medicines and other items in a neat manner, protected from dust, moisture, excessive light. Adequate provisions should be available for storing various medicines at prescribed temperature conditions.

The counseling area should be furnished with:

- (i) A table.
- (ii) Chair for the Pharmacist and a couple of patients
- (iii) Cabinet for storing patient medication records (PMRs)

Equipment: The pharmacy should be equipped with refrigerated storage facilities (validated from time to time) and should be available for products requiring storage at cold temperature.

The counseling area should be equipped with:

- (i) Reference material.
- (ii) Demonstration charts, kits and other demonstration material.
- (iii) Patient information leaflets (PILs).
- (iv) Some basic instruments for e.g. Sphygmomanometer, glucometer, Snellens chart, stethoscope, etc.
- (v) Weight and height scale.

The pharmacy should preferably be equipped with computers and appropriate software that can:

1. Manage inventory
2. Manage invoicing
3. Generate timely warning for expiring medicines
4. Archive patient medication records.

The computer should also be equipped to give demonstrations to the patients and other relevant purposes. Compounding section of the pharmacy should be equipped as prescribed under Schedule N to the Drugs and Cosmetics Rules. Other equipment, as necessary for operations, should also be available.

Personnel: The Community Pharmacy should be managed under the overall supervision of a chief pharmacist, who will have the final responsibility for all the professional activities and operations. All staff members including newly recruited staff should be trained as per the staff training policy of the pharmacy. All activities in the Pharmacy should be carried out as per well documented guidelines and procedures, which should have been framed by the management in consultation with the Chief Pharmacist. Each staff member should have clearly allotted responsibilities, which must be performed according to documented standard operating procedures. All personnel in the pharmacy must, at all times, wear a neat apron/coat. All Pharmacists should additionally wear a badge prominently displaying their name and the word "Pharmacist". Additionally, a recent photograph, qualification certificate and the State Pharmacy Council Registration Certificate may be displayed in clear view of the clients entering the pharmacy. Due to regular exposure to patients some of whom may be carriers of contagious diseases all pharmacy personnel should wear medically examined and adequately immunized periodically and their health data should be archived.

Pharmacists working in the pharmacy should:

1. Hold at least a Diploma in Pharmacy (D.Pharm.) and preferably a degree (B.Pharm./M.Pharm.) in Pharmacy.
2. Be registered as a pharmacist with the Pharmacy council of the state in which he/she is practicing.
3. Have undergone adequate practical training in a community pharmacy.
4. Undergo in-house training as per the organization's staff training policy.
5. Have communication skills & capabilities to give adequate and proper advice to the clients on the appropriate use of medicines, illness, etc. so as to achieve optimal patient compliance.^[4]



Figure-5: Drug store.

Each Pharmacist working in the pharmacy must be competent enough to: (i) Play a professional role to assess prescriptions. (ii) Advise the patients on appropriate selection and use of OTC medicines. (iii) Advise patients on appropriate use of prescribed medicines. (iv) Check & advice on drug-drug and drug-food interactions. (v) Be alert for adverse drug reactions. (vi) Comprehend the client's condition or illness and provide advice on proper use of medication and diet. (vii) Assess the patient's condition and decide when to refer him/her to the doctor. (viii) Perform the role of a health care provider and a counselor.

Systems: The pharmacy should have well defined and documented systems for each operation carried out in the pharmacy.

Quality Policy: It is a general declaration of the intent of the pharmacy about the level of quality of service and products offered to the public. Quality goals emanate from the stated quality policy and they are the targets, which are set and which can be in a stipulated period of time. Different quality goals need to be set in the various operational areas of the pharmacy. It is the responsibility of the Chief Pharmacist to formulate a Quality Policy and set and achieve Quality Goals along with the management and other staff. The pharmacy should have a quality manual, which should state, in detail, the necessary steps to be carried out for fulfillment of the desired quality goals. The manual should also enlist the details of the activities, routines, distribution of responsibilities, work procedures and instructions that are necessary for achieving the quality goals in day-to-day operations in the pharmacy. The Quality Manual should be accessible to the staff of the pharmacy for their easy reference. All the activities mentioned in the Quality Manual should be well documented, and it shall be the final responsibility of the Chief Pharmacist to ensure that the pharmacy quality goals are in consonance with the quality policy of the pharmacy. The Chief Pharmacist should ensure that the quality policy and quality goals are understood, implemented and maintained throughout the operations in the pharmacy. Timely audits should be conducted to check the extent to which the pharmacy meets its quality goals and the

outcomes should be documented for a review to further improve the process.

Service policy is a statement of the nature of services provided in the pharmacy and the standards laid down for the provision of those services. The pharmacy should have a well-documented service policy based on its client servicing goals. Service policy statement should include issues like home delivery of products, the nature and level of attention to be given to clients of various kinds (e.g. elderly clients, regular clients, etc.). The service manual should state, in detail, the necessary steps to be carried out for providing each service offered in the pharmacy. Promptness of service, service time and pharmacy operation schedule, etc. form an important part of the service policy. The manual should also enlist the details of the activities, routines, distribution of responsibilities, work procedures and instructions that are necessary for provision of the services in day to day operations of the pharmacy.

Staff Training Policy: A well-conceived and implemented staff training policy has the potential to determine the future of the pharmacy in the community in which it operates. Availability of adequate reference resources (books, current periodicals, software, etc.) in the pharmacy is the fundamental requirement of the training process. Training policy should encompass the needs evolving out of service policy of the pharmacy. The policy should prescribe the content & frequency of the training and the training resources. Training policy should ensure that all personnel in the pharmacy are kept abreast of the developments in their fields. Upgrading communication and inter-personal skills should form the core of the training policy so that pharmacy personnel can operate in tandem with other healthcare providers on one end and are able to form professional bonds with the clients on the other. Efforts should be made to involve professional representatives of pharmaceutical companies in the trading process. The policy should prescribe the minimum continuing education levels to be attained by each staff member so that the ultimate goal of pharmacy-provision of Pharmaceutical Care – is achieved. All pharmacy personnel should be aware of Quality Policy of the pharmacy, and should be conscious

about their role of delivering health care to the clients. They should be trained & made aware of minimal personal hygiene levels, as well as the level of hygiene to be maintained in storage and handling of medicines.

Special emphasis should be laid on training: (i) **Pharmacists:** in communication & counseling skills, handling of prescriptions & clients, continuing education in illnesses & drugs, latest developments in the field of medicine and pharmacy and general health matters, on “when to refer” to a doctor. (ii) **Pharmacy assistants:** in communication skills, salesmanship, handling of prescriptions, dispensing of drugs, procurement & storage of drugs, and “when to refer” to a Pharmacist for

counseling. Procedures for imparting education/training should be well documented, and carried out as per a predetermined schedule. Training process should be well documented and reviewed periodically. Pharmacists should be encouraged to keep their knowledge up-to – date through scientific literature, textbooks, journal and periodicals, workshops, etc. Networking with pharmacists in other pharmacies should be encouraged. Management and the Chief Pharmacist shall be responsible to continuously train the human resources available in the pharmacy to ensure maximum benefits to the community.



Figure-6: Pharmacy practitioners.

Complaints policy: The pharmacy should have a complaints policy which should be reviewed from time to time. All complaints-oral or written- must be immediately addressed by the pharmacist, and suitable action be taken to amend the situation. The complaint, its nature, the erring person’s name and the action taken must be documented in a complaint register. The event should be reviewed and evaluated to find the underlying cause(s). Appropriate steps should be taken to amend the operating procedures or other guidelines so as to prevent the recurrence of the same or similar events.

Drug Recall Policy: The Pharmacist should have a well-documented recall policy: (i) The pharmacy should proactively participate in any state wide or nationwide recall process for any substandard drug. All such records should be initiated upon receiving authentic information and alarms to do so. The initiation, progress and completion of recall should be well documented. Adequate vigilance must be maintained to look out for recall alarms from regulatory sources as well as from pharmaceutical companies. (ii) In case of any suspicion, the pharmacist should take immediate steps to stop the sale of drug and notify the relevant parties. (iii) If the pharmacist has a suspicion or a reason to believe that short comings have occurred in the process of delivery of medicines from the pharmacy, immediate effective

measures should be initiated to minimize the risk of damage or danger to the patient(s).^[5]

Audit Policy: Audits are conducted to check whether the Quality Management Systems are functioning properly, and as per guidelines set forth in the Quality Manual, to see whether the desired objectives of the pharmacy are being achieved. By a Quality Audit, the Chief Pharmacist can evaluate the different routine processes and the quality systems in the pharmacy, and check whether the systems are functioning as per requirements. This is achieved by frequent internal audit and a periodic external audit. Based on the audit reports, steps should be initiated to make necessary improvements. The internal audit can be conducted by the chief pharmacist along with the senior staff or members of the management team. The staff deployed for internal audit should be adequately trained for the purpose. Audit may be carried out once in six months, or more frequently. An external audit must be done at least once a year by external auditors, who are competent to do so and are appointed by the management. All audit procedures should be suitably documented. The audit report should be used to analyze the weaknesses and defects in the system so that rectifications are initiated.



Figure-7: Laboratory testing of drugs.

Documentation system: Documentation is one of the core activities for achieving and maintaining quality. The overall responsibility for documentation rests with the chief pharmacist. All necessary statutory documents (for e.g. regulatory licenses, registrations, permissions, etc.) for operating a pharmacy must be adequately maintained and should be displayed if required under the law. In all cases they should be easily accessible whenever required. All operational documents, for e.g., purchase invoices, sales invoices, and other statutory documents should be maintained and archived as prescribed by the law. There should also be adequate control and maintenance of documents that form a part of the pharmacist's quality system.

Some of the necessary documents include: (i) Protocols (ii) Standard Working Procedures (iii) Operation instructions (iv) Quality Manual (v) Cleaning and maintenance processes and records (vi) Complaint records (vii) Audit records (internal and external) (viii) Policy documents (ix) Personal details.

In addition, the documents required for the pharmaceutical care process should also be adequately maintained and stored. These documents include: (i) Patients' health profile (ii) Patients' medication records (iii) Records of counseling follow-ups, etc.

Nature of the work: Historically, the fundamental role of pharmacists as a healthcare practitioner was to check and distribute drugs to doctors for medication that had been prescribed to patients. In more modern times, pharmacists advise patients and health care providers on the selection, dosages, interactions and side effects of medications and act as a learned intermediary between a prescriber and a patient. Pharmacists monitor the health and progress of patients to ensure the safe and effective use of medication. Pharmacists may practice compounding; however, many medicines are now produced by pharmaceutical companies in a standard dosage and drug delivery form. In some jurisdictions, pharmacists have prescriptive authority to either independently prescribe under their own authority or in collaboration with a primary care physician through an

agreed upon protocol. Increased numbers of drug therapies, ageing but more knowledgeable and demanding populations and deficiencies in other areas of the health care system seem to be driving increased demand for the clinical counseling skills of the pharmacist. One of the most important roles that pharmacists are currently taking on is one of pharmaceutical care. Pharmaceutical care involves taking direct responsibility for patients and their disease states, medications and management of each to improve outcomes. Pharmaceutical care has many benefits that may include but are not limited to: decreased medication errors; increased patient compliance in medication regimen; better chronic disease state management, including hypertension and other cardiovascular disease risk factors; strong pharmacist-patient relationship; and decreased long-term costs of medical care.^[6]

Pharmacists are often the first point-of-contact for patients with health inquiries. Thus pharmacists have a significant role in assessing medication management in patients, and in referring patients to physicians. These roles may include, but are not limited to: 1. Clinical medication management, including reviewing and monitoring of medication regimens. 2. Assessment of patients with undiagnosed or diagnosed conditions, and ascertaining clinical medication management needs. 3. Specialized monitoring of disease states, such as dosing drugs in kidney and liver failure. 4. Compounding medicines providing pharmaceutical information providing patients with health monitoring and advice, including advice and treatment of common ailments and disease states. 5. Supervising pharmacy technicians and other staff. 6. Oversight of dispensing medicines on prescription. 7. Provision of and counseling about non-prescription or over-the-counter drugs. 8. Education and counseling for patients and other health care providers on optimal use of medicines (e.g., proper use, avoidance of overmedication). 9. Referrals to other health professionals if necessary. 10. Pharmacokinetic evaluation. 11. Promoting public health by administering immunizations. 12. Ensuring correctness of all medication labels including auxiliary labels.

Education and credentialing: The role of pharmacy education, pharmacist licensing, and continuing education vary from country to country and between regions/localities within countries. In most countries, pharmacists must obtain a university degree at a pharmacy school or related institution, and/or satisfy other national/local credentialing requirements. In many contexts, students must first complete pre-professional (undergraduate) coursework, followed by about four years of professional academic studies to obtain a degree in pharmacy (B.Pharm. & M.Pharm.). Pharmacists are educated in pharmacology, pharmacognosy, chemistry, organic chemistry, biochemistry, pharmaceutical chemistry, microbiology, pharmacy practice (including

drug interactions, medicine monitoring, medication management), pharmaceuticals, pharmacy law, physiology, anatomy, pharmacokinetics, pharmacodynamics, drug delivery, pharmaceutical care, nephrology, hepatology and compounding of medications. Additional curriculum may cover diagnosis with emphasis on laboratory tests, disease state management, therapeutics and prescribing (selecting the most appropriate medication for a given patient). On graduation, pharmacists are licensed, either nationally or regionally, to dispense medication of various types in the areas they have trained for. Some may undergo further specialized training, such as in cardiology or oncology.^[7]



Figure-8: Stock maintenance.

Practice specialization: Academic pharmacist, Clinical pharmacy specialist, Community pharmacist, Compounding pharmacist, Consultant pharmacist, Drug information pharmacist, Home health pharmacist, Hospital pharmacist, Industrial pharmacist, Informatics pharmacist, Locum pharmacist, Managed care pharmacist, Military pharmacist, Nuclear pharmacist, Oncology pharmacist, Regulatory-affairs pharmacist, Veterinary pharmacist, Pharmacist clinical pathologist, Pharmacist clinical toxicologist.

Education: Acceptance into a doctorate of pharmacy program depends upon completing specific prerequisites or obtaining a transferable bachelor's degree. Pharmacy school is four years of graduate school (accelerated Pharmacy Schools go January to January and are only 3 years), which include at least one year of practical experience. Graduates receive a Doctorate of Pharmacy (Pharm.D.) upon graduation. Most schools require students to take a Pharmacy College Admissions Test PCAT and complete 90 credit hours of university coursework in the sciences, mathematics, composition, and humanities before entry into the PharmD program. Due to the large admittance requirements and highly competitive nature of the field, most pharmacy students complete a bachelor's degree before entry to pharmacy school.

Possible prerequisites: Anatomy, Physiology, Biochemistry, Biology, Immunology, Chemical engineering, Economics, Pathophysiology, Physics, Humanities, Microbiology, Molecular biology, Organic chemistry, Physical chemistry, Statistics, Calculus.

Besides taking classes, additional requirements before graduating may include a certain number of hours for community service, e.g., working in hospitals, clinics, and retail. *Estimated timeline:* 4 years undergraduate + 4 years doctorate + 1–2 years residency + 1–3 years fellowship = 8–13 years. A doctorate of pharmacy (except non-traditional, i.e. transferring a license from another country) is the only degree accepted by the National Associate of Boards of Pharmacy NABP to be eligible to "sit" for the North American Pharmacist Licensure Examination (NAPLEX). Previously the United States had a 5-year bachelor's degree in pharmacy. For BS Pharmacy graduates currently licensed in US, there are 10 Universities offering non-traditional doctorate degree programs via part-time, weekend or on-line programs. These are programs fully accredited by Accreditation Council for Pharmacy Education (ACPE) but only available to current BS Pharmacy graduates with a license to practice pharmacy. Some institutions still offer 6 year accelerated Pharm.D. programs (similar to 6 year MD programs), though in both cases the issuance of a doctoral degree in less than 8 years is

controversial. The current Pharm.D. degree curriculum is considerably different from that of the prior BS in pharmacy. It now includes extensive didactic clinical preparation, a full year of hands-on practice experience in a wider array of healthcare settings, and a greater emphasis on clinical pharmacy practice pertaining to pharmacotherapy optimization. Legal requirements in the US to becoming a pharmacist include: graduating from an accredited PharmD program, conducting a specified number of internship hours under a licensed pharmacist (i.e. 1800 hours in some states), passing the NAPLEX, and passing a Multi-state Pharmacy Jurisprudence Exam MPJE. Arkansas, California, and Virginia have their own exams instead of the MPJE and pharmacists must pass the Arkansas Jurisprudence Exam, California Jurisprudence Exam, and Virginia Law Exam, respectively.

Residency is an option for post-graduates that are typically 1–2 years in length. A residency gives licensed pharmacists decades of clinical experience in an extremely condensed timeframe of only a few short years. In order for new graduates to remain competitive, employers generally favor residency trained applicants for clinical positions. The profession is moving toward resident-trained pharmacists who wish to provide direct patient care clinical services. In 1990, the American Association of Colleges of Pharmacy (AACP) required the new professional degree. Graduates from a Pharm.D. program may also elect to do a fellowship that is geared toward research. Fellowships can vary in length but last 1–3 years depending on the program and usually require 1 year of residency at minimum.

CONCLUSION

Pharmacy healthcare professionals have the following duties:

1. Medication Therapy Management: Customized educational interventions to prevent underutilization, overutilization, inappropriate use and abuse of certain drugs.
2. Patient Counseling: Our services go well beyond evaluating patients' drug profiles. Motivational interviews investigate why patients take medications improperly, break communication barriers with patients and improve their health outcomes by enhancing compliance to physicians' recommendations.
3. Drug Information Services: Provides timely, evidence-based drug information to promote safe, rational use of medications.
4. Clinical Toxicology Services: The services include poison information and toxicology screening for accidental and intentional overdoses of medicines, illicit drugs and toxins.
5. Medication reconciliation: Compares patient's medication orders to medication history and helps avoid errors of omission, duplication, incorrect doses or timing and adverse drug-drug or drug-disease interactions.

6. Pharmacovigilance (Adverse drug reaction (ADR) monitoring and reporting): Ensures patient safety and involves causality assessment of Adverse Events, ADR reporting and monitoring. Pharmacists assist clinicians in prevention and management of ADRs.
7. Periodic Safety Update Report (PSUR): Periodical reporting of the complete safety experience of newly introduced drugs to regulatory authorities. This is a critical component of a nation-wide programme for post marketing surveillance (Phase-IV study). PSUR helps DCGI (Drug Controller General of India) to make accurate and unbiased decisions for implementing drug safety.
8. Health Screening Programme: Enhances access to screening services to the poor. Healthcare services include monitoring of blood pressure, blood cholesterol, body mass index (BMI) and blood glucose.
9. Clinical Research Support: This is followed by regular attending workshops, seminars, symposium and conferences at the national and international level to develop clinical skill and hands-on training are offered to working pharmacists. Pharmacists conduct and monitor clinical research, support physicians and other healthcare professionals in framing/executing research protocols and publishing research findings.
10. Group discussion: This is essential for the growing pharmacy professionals to share their viewpoints among doctors and pharmacists regarding healthcare system to improve their skills.

Career opportunities

The demand for trained pharmacy professionals has significantly increased in recent years due to the phenomenal growth of the health care services/pharmaceutical industries. Ageing population, rising trends in chronic illnesses, enhanced insurance cover and higher disposable income are major contributing factors. Pharmacists are becoming more actively engaged in drug therapy decision-making and pharmaceutical care. There is a rising demand for pharmacists in a wide variety of occupational settings.

Following are some of the numerous and diverse career options available to Pharm.D./M.Pharm. (Pharmacy Practice) graduates.

1. **Clinical Pharmacy Practice:** Pharmacists are increasingly partnering with physicians in assuming responsibility for medication therapy management, especially in chronic diseases such as diabetes, asthma, hypertension. Specialists are emerging in paediatrics, critical care, cardiology, surgery, psychopharmacy, neurology, infectious diseases and drug information.
2. **Community Pharmacy:** Community pharmacists often constitute the first line of health care. In addition to dispensing medications and monitoring patients for adverse effects and drug interactions,

pharmacists provide important counseling services in the choice of over-the-counter medications, referrals to other healthcare providers and healthcare screening programmes.

3. **Public Services:** State and Central Government Agencies such as State Pharmacy Councils, Central Drugs Standard Control Organization (CDSCO), Indian Pharmacopoeia Commission (IPC) require skilled pharmacists as regulators.
4. **Home Healthcare:** Patients formerly treated in a hospital setting are now receiving professional home care. Pharm.D./M.Pharm. (Pharmacy Practice) graduates can dispense medication and assist in administration of intravenous antibiotics, pain management medication and chemotherapy. Pharmacists can potentially follow practices already prevalent in developed countries in monitoring the patient's progress, adjusting therapy as needed.
5. **Hospital Pharmacy:** Pharmacists in hospitals have a tremendously expanded role within this traditional role. Pharmacist manage operations and play a decisive role in Pharmacy administration.
6. **Managed Care:** Popular in developed countries, managed care is a cost effective, comprehensive and integrated health care plan that emphasizes on preventive care. Optimization of drug therapy, development of drug information, evaluation of therapeutic protocols, patient consultation and reducing avoidable hospital visits dominate the managed care environment.
7. **Pharmaceutical Industry:** Pharmaceutical industry recognizes the need for technical proficiency among product development personnel. Additionally, skills in research and development provide numerous opportunities. Pharm. D. and M. Pharm. are actively recruited by major pharmaceutical manufacturers for managing pharmacovigilance, clinical trials, medical writing, medical affairs etc.
8. **Pharmacoeconomics:** Society's demand for experts in pharmaco-economics is steadily increasing. Governmental agencies, health insurance providers, professional associations, hospital administration departments, health care consultancy organizations, pharmaceutical companies are likely to recruit more experts in pharmaco-economics.
9. **Pharmacy Education:** Pharm. D. curriculum offers a strong foundation in health sciences. Pharm. D. graduates regularly join various colleges that impart clinical pharmacy education and research.
10. **Specialized Area Opportunities:** Pharmacists with expertise in specialized areas such as consultancy, legal practice, drug information, poison control and pharmacy affairs are gaining ground with time. Pharm.D. and M.Pharm. graduates can pursue Ph.D. to enter academic professions.
11. **Research and Postdoc Opportunities:** Pharm.D. graduates are eligible to directly join for Postdoc program in various foreign universities.
12. **Foreign Pharmacy Licensure Examinations:** Pharm.D. and M.Pharm. (Pharmacy Practice)

graduates are eligible to write various foreign pharmacy licensure examinations including in USA. It is one of the mandatory component of the licensure process of most of the Western countries and is used by the boards of pharmacy as part of their assessment of a candidate's competence to practice as a pharmacist.

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