

Pharmacy

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Pharmacy (from the Greek *φάρμακον* = drug) is a transitional field between health sciences and chemical sciences and a profession charged with ensuring the safe use of medication. Traditionally, pharmacists have



Pharmacy and Pharmacology Portal



Bowl of Hygieia

compounded and dispensed medications on the orders of physicians. More recently, pharmacy has come to include other services related to patient care including clinical practice, medication review, and drug information. Some of these new pharmaceutical roles are now mandated by law in various legislatures. Pharmacists, therefore, are drug therapy experts, and the primary health professionals who optimise medication management to produce positive health-outcomes.

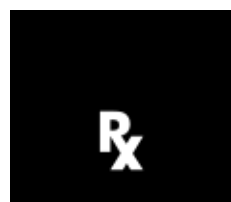
The symbols most commonly associated with pharmacy are the mortar and pestle and the **R_x** (*recipere*) character. Pharmacy organisations often employ other elements, such as the Bowl of Hygieia, conical measures, and caduceuses in their logos. Other symbols are common in different countries such as the green Greek cross in France and the United Kingdom, the increasingly-rare Gaper in The Netherlands, and a red stylised letter A in Germany and Austria, *Apotheke* being the German word for pharmacy.



Bowl of Hygieia



Green Greek Cross



Mortar and pestle



Recipe symbol



red stylised "A"

Caduceus

Rod of Asclepius

Gaper

Contents

- 1 Disciplines
- 2 Pharmacists
- 3 Separation of prescribing from dispensing
- 4 Community pharmacy
- 5 Hospital pharmacy
- 6 Consultant pharmacy
- 7 Internet pharmacy
- 8 The future of pharmacy
- 9 See also
- 10 External links
 - 10.1 Regulatory
 - 10.2 History and traditions
 - 10.3 Other

Disciplines



Pharmacy, *tacuinum sanitatis casanatensis*
(XIV century)

The field of Pharmacy can generally be divided into three main disciplines:

- Pharmaceutics
- Pharmaceutical chemistry and Pharmacognosy
- Pharmacy practice

The boundaries between these disciplines and with other sciences, such as biochemistry, are not always clear-cut; and often, collaborative teams from various disciplines research together.

Pharmacology

is sometimes considered a fourth discipline of pharmacy. Although pharmacology is essential to the study of

pharmacy, it is not specific to pharmacy. Therefore it is usually considered to be a field of the broader sciences.

There are various specialties of pharmacy practice. Some specialisation is based on the place of practice including: community, hospital, consultant, locum, drug information, regulatory affairs, industry, and academia. Other specialisations are based on clinical roles including: nuclear, oncology, cardiovascular, infectious disease, diabetes, nutrition, geriatric, and psychiatric pharmacy.

Pharmacists

Pharmacists

are highly-trained and skilled healthcare professionals who perform various roles to ensure optimal health outcomes for their patients. Many pharmacists are also small-business owners, owning the pharmacy in which they practice.

Pharmacists are represented internationally by the International Pharmaceutical Federation (FIP). They are represented at the national level by professional organisations such as the Royal Pharmaceutical Society of Great Britain (RPSGB), the Pharmacy Guild of Australia (<http://www.guild.org.au>) (PGA), and the American Pharmacists Association (APhA). *See also: List of pharmacy associations.*

In some cases, the representative body is also the registering body, which is responsible for the ethics of the profession. Since the Shipman Inquiry (<http://www.the-shipman-inquiry.org.uk>) , there has been a move in the UK to separate the two roles.

Separation of prescribing from dispensing

In most jurisdictions (such as the United States), pharmacists are regulated separately from physicians. Specifically, the legislation stipulates that the practice of prescribing must be separate from the practice of dispensing. These jurisdictions also usually specify that *only* pharmacists may supply scheduled pharmaceuticals to the public, and that pharmacists cannot form business partnerships with physicians or give them "kickback" payments. However, the American Medical Association (AMA) Code of Ethics provides that physicians may dispense drugs within their office practices as long as there is no patient exploitation and patients have the right to a written prescription that can be filled elsewhere. 7 to 10 percent of American physician practices reportedly dispense drugs on their own.[1] (http://www.aascif.org/public/jul_aug_sep06/drugs.htm)

In other jurisdictions (particularly in Asian countries such as China, Hong Kong, Malaysia, and Singapore), doctors are allowed to dispense drugs themselves and the practice of pharmacy is sometimes integrated with that of the physician, particularly in traditional Chinese medicine.

In Canada it is common for a medical clinic and a pharmacy to be located together and for the ownership in both enterprises to be common, but licensed separately.

The reason for the majority rule is the high risk of a conflict of interest. Otherwise, the physician has a financial self-interest in "diagnosing" as many conditions as possible, and in exaggerating their seriousness, because he or she can then sell more medications to the patient. Such self-interest directly conflicts with the patient's interest in obtaining cost-effective medication and avoiding the unnecessary use of medication that may have side-effects.

A campaign for separation has begun in many countries and has already been successful (like in Korea). As many of the remaining nations move towards separation, resistance and lobbying from dispensing doctors who have pecuniary interests may prove a major stumbling block (e.g. in Malaysia).

Community pharmacy

A **pharmacy** (commonly the **chemist** in Australia, New Zealand and the UK; or **drugstore** in North America; or Apothecary, historically) is the



19th century Italian pharmacy



Modern pharmacy in Norway

place where most pharmacists practise the profession of pharmacy. It is the community pharmacy where the dichotomy of the profession exists—health professionals who are also retailers.

Community pharmacies usually consist of a retail storefront with a dispensary where medications are stored and dispensed. The dispensary is subject to pharmacy legislation; with requirements for storage conditions, compulsory texts, equipment, *etc.*, specified in legislation. Where it was once the case that pharmacists stayed within the dispensary compounding/dispensing medications; there has been an increasing trend towards the use of trained pharmacy technicians while the pharmacist spends more time communicating with patients.

All pharmacies are required to have a pharmacist on-duty at all times when open. In many jurisdictions, it is also a requirement that the owner of a pharmacy must be a registered pharmacist (R.Ph.). This latter requirement has been revoked in many jurisdictions, such that many retailers (including supermarkets and mass merchandisers) now include a pharmacy as a department of their store.

Likewise, many pharmacies are now rather grocery store-like in their design. In addition to medicines and prescriptions, many now sell a diverse arrangement of additional household items such as shampoo, bandages, office supplies, candy, and snack foods.

Hospital pharmacy

Pharmacies within hospitals

Pharmacies within hospitals differ considerably from community pharmacies. Some pharmacists in hospital pharmacies may have more complex clinical medication management issues whereas pharmacists in community pharmacies often have more complex business and customer relations issues. Because of the complexity of medications including specific indications, effectiveness of treatment regimens, safety of medications (i.e., drug interactions) and patient compliance issues (in the hospital and at home) many pharmacists practicing in hospitals gain more education and training after pharmacy school through a pharmacy practice residency and sometimes followed by another residency in a specific area. Those pharmacists are often referred to as clinical pharmacists and they often specialize in various disciplines of pharmacy. For example, there are pharmacists who specialize in haematology/oncology, HIV/AIDS, infectious disease, critical care, emergency medicine, toxicology, nuclear pharmacy, pain management, psychiatry, anticoagulation clinics, herbal medicine, neurology/epilepsy management, paediatrics, neonatal pharmacists and more.

Hospital pharmacies can usually be found within the premises of the hospital. Hospital pharmacies usually stock a larger range of medications, including more specialized medications, than would be feasible in the community setting. Most hospital medications are unit-dose, or a single dose of medicine. Hospital pharmacists and trained

pharmacy technicians compound sterile products for patients including total parenteral nutrition (TPN), and other medications given intravenously. This is a complex process that requires adequate training of personnel, quality assurance of products, and adequate facilities. Some hospital pharmacies have decided to outsource high risk preparations and some other compounding functions to companies who specialize in compounding.

Consultant pharmacy

Consultant pharmacy practice focuses more on medication regimen review (i.e. "cognitive services") than on actual dispensing of drugs. Consultant pharmacists most typically work in nursing homes, but are increasingly branching into other institutions and non-institutional settings. Traditionally consultant pharmacists were usually independent business owners, though in the United States many now work for several large pharmacy management companies (primarily Omnicare, Kindred Healthcare and PharMerica). This trend may be gradually reversing as consultant pharmacists begin to work directly with patients, primarily because many elderly people are now taking numerous medications but continue to live outside of institutional settings. Some community pharmacies employ consultant pharmacists and/or provide consulting services.

Internet pharmacy

Since about the year 2000, a growing number of Internet pharmacies have been established worldwide. Many of these pharmacies are similar to community pharmacies, and in fact, many of them are actually operated by brick-and-mortar community pharmacies that serve consumers online and those that walk in their door. The primary difference is the method by which the medications are requested and received. Some customers consider this to be more convenient and private method rather than traveling to a community drugstore where another customer might overhear about the drugs that they take. Internet pharmacies (also known as Online Pharmacies) are also recommended to some patients by their physicians if they are homebound.

While most Internet pharmacies sell prescription drugs and require a valid prescription, some Internet pharmacies sell prescription drugs without requiring a prescription. Many customers order drugs from such pharmacies to avoid the "inconvenience" of visiting a doctor or to obtain medications which their doctors were unwilling to prescribe. However, this practice has been criticized as potentially dangerous, especially by those who feel that only doctors can reliably assess contraindications, risk/benefit ratios, and an individual's overall suitability for use of a medication. There also have been reports of such pharmacies dispensing substandard products. Of course as history has shown, substandard products can be dispensed by both Internet and Community pharmacies, so it is best that the buyer beware.

Canada is home to dozens of licensed Internet pharmacies, many which sell their lower-cost prescription drugs to U.S. consumers, who pay the world's highest drug prices. However, there are Internet pharmacies in many other countries including Israel, Fiji and the UK that serve customers worldwide.

In the United States, there has been a push to legalize importation of medications from Canada and other countries, in order to reduce consumer costs. While in most cases importation of prescription medications violates Food and Drug Administration (FDA) regulations and federal laws, enforcement is generally targeted at international drug suppliers, rather than consumers. There is no known case of any U.S. citizens buying Canadian drugs for personal use with a prescription, who has ever been charged by authorities.

The future of pharmacy

In the coming decades, pharmacists are expected to become more integral within the health care system. Rather than simply dispensing medication, pharmacists expect to be paid for their cognitive skills.[2] (http://www.ascpfoundation.org/programs/prog_fleetwood.htm)

This paradigm shift has already commenced in some countries; for instance, pharmacists in Australia receive remuneration from the Australian Government

for conducting comprehensive Home Medicines Reviews. In the United Kingdom, pharmacists (and nurses) who undertake additional training are obtaining prescribing rights. In the United States, consultant pharmacists, who traditionally operated primarily in nursing homes are now expanding into direct consultation with patients, under the banner of "senior care pharmacy." [3] (<http://www.ascp.com/consumers/what/>)

See also

- Consultant pharmacist
- Hospital pharmacy
- List of pharmacies
- List of pharmacy associations
- List of schools of pharmacy
- Nuclear pharmacy
- Pharmaceutical company

External links

Regulatory

- National Association of Boards of Pharmacy (<http://www.nabp.net>)
- National Association of Pharmacy Regulatory Authorities (Canada) (<http://www.napra.org>)
- Pharmacy Board of New South Wales (<http://www.pbns.w.gov.au>)
- Pharmacy Board of Victoria (Australia) (<http://www.pharmacybd.vic.gov.au>)
- Pharmacy Council of New Zealand (<http://www.pharmacycouncil.org.nz/index.asp>)
- Pharmacy Council of India (<http://www.pci.nic.in>)

History and traditions

- Navigator History of Pharmacy (<http://www.ubka.uni-karlsruhe.de/pharm/pharmaziegeschichte/index-e.html>) Collection of internet resources related to the history of pharmacy.
- RPSGB Museum Information Sheets (<http://www.rpsgb.org.uk/members/museum/mussheet.htm>) Illustrated information sheets on objects in the history of pharmacy.
- History of Pharmacy Web Pages (http://home.swipnet.se/PharmHist/Lankar/lankar_en.html) Perbo's History of Pharmacy Web Pages.
- Soderlund Pharmacy Museum (<http://www.drugstoremuseum.com>) - Information about the history of the American Drugstore
- The Lloyd Library (<http://www.lloydlibrary.org/>) Library of botanical, medical, pharmaceutical, and scientific books and periodicals, and works of allied sciences
- American Institute of the History of Pharmacy (<http://www.aihp.org>) American Institute of the History of Pharmacy--resources in the history of pharmacy

Other

- PharmWeb (<http://www.pharmweb.net>) - Pharmaceutical Portal.
- World Pharmacy (<http://www.world-pharmacy.info>) - Pharmaceutical Information Guide.
- Pharmer (<http://www.pharmer.com>) - Pharmaceutical Information Online.
- EgyPharmaZone (<http://www.egypharmazone.com>) - Largest Egyptian Pharmaceutical Portal.
- The Virtual Library of Pharmacy (<http://www.pharmacy.org/>) - Extensive index of pharmacy-related resources, including information on careers in pharmacy, pharmacy schools, pharmaceutical companies, associations and conferences.
- Virtual Library of Biochemistry and Cell Biology (<http://www.biochemweb.org/chemical.shtml>) - Resource devoted to drug discovery and chemical and pharmacological approaches to biology, biomedicine and biotechnology.

- The British Library, Pharmacy Industry section (<http://www.bl.uk/collections/business/pharmind.html>)
- Pharmacist.com (<http://www.pharmacist.com>) - Portal site for pharmacists and pharmacy students.
- Museu da Farmácia (http://www.anf.pt/site/index.php?page=data/anf/museu_farmacia.php/) - Pharmacy Museum in Lisbon
- auspharm.net.au (<http://www.auspharm.net.au>) - Portal for pharmacists practising in Australia, providing useful links, a discussion list, and feature articles
- Pakistan Pharmacists Society (<http://www.pharmacist.pk>) - National association of pharmacists

to promote and expand their role in public health and patient care in Pakistan

- community pharmacy CE (<http://www.pharmacyvaluealliance.org/>) - community pharmacy CE site
- Pharmacist's Letter (<http://www.pharmacistsletter.com>) - Unbiased, research based resource for pharmacists and pharmacy technicians on new developments in drug therapy

Chemistry

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