CHAPTER

1

Historical Background and Development of Profession of Pharmacy

THE HISTORY OF THE PHARMACY PROFESSION IN INDIA

The history of the pharmacy profession in India can be traced to ancient times when traditional systems of medicine were prevalent. The evolution of pharmacy in India can be broadly categorized into different eras, each marked by distinct developments in the field.

1. **Ancient Era**
   - *Ayurveda and Susruta Samhita:* Ancient Indian medicine, particularly Ayurveda, played a crucial role in the early development of pharmacy. The Susruta Samhita, an ancient Sanskrit text on surgery and medicine, included information on the preparation and use of various medicinal substances.
   - *Charaka Samhita:* Another important Ayurvedic text, the Charaka Samhita, also provided insights into pharmaceutical processes, including the preparation of drugs from plant and mineral sources.
2. **Medieval Era**
   - *Arab Influence:* During the medieval period, the Arab influence on Indian medicine brought about advancements in pharmacy. Arab scholars translated Greek and Roman texts, contributing to the synthesis of traditional Indian and Greco-Arabic medical knowledge.
   - *Unani Medicine:* The Unani system of medicine, which is based on the teachings of Greek physicians like Hippocrates and Galen, gained prominence during this era. It influenced the development of pharmacy in India.
3. **Colonial Era**
   - *European Influence:* With the arrival of European powers in India, particularly the British, there was an impact on the practice of medicine and pharmacy. European pharmacopoeias and practices began to influence the traditional systems of medicine.
   - *Establishment of Medical Colleges:* The establishment of medical colleges in the 19th century, such as the Madras Medical College (1835), Calcutta Medical College (1835), and Grant Medical College in Bombay (1845), played a role in shaping modern pharmaceutical education.

4. **Post-Independence Era**
   - *Pharmacy Education:* After India gained independence in 1947, there was a focus on modernizing education and healthcare. Pharmacy education underwgone significant reforms, and colleges offering formal courses in pharmacy were established.
   - *Pharmacy Act, 1948:* The Pharmacy Act, 1948, was a landmark legislation that regulated the pharmacy profession in India. It established the Pharmacy Council of India (PCI) to oversee pharmacy education and practice.
5. **Contemporary Era**
   - *Globalization and Modernization:* In recent decades, globalization has led to the adoption of international standards in pharmaceutical manufacturing and research. The Indian pharmaceutical industry has grown to become a major player globally.
   - *Technological Advancements:* The advent of technology has revolutionized pharmaceutical research, manufacturing, and dispensing. Computerization and automation have become integral to pharmacy practice.

A. History of the Profession of Pharmacy in India in Relation to Pharmacy Education

- Pharmacy education in India, at the certificate level, commenced in 1842 in Goa under Portuguese influence.
- The formal training of pharmacists began in 1881 in Bengal and later evolved into a university-level program at Banaras Hindu University (Varanasi) in 1937.
- Recognizing pharmacy as a crucial healthcare profession, the independent government of India enacted 'The Pharmacy Act' in 1948 to regulate both the pharmacy profession and education.
- 'William Procter Jr.' (an American Pharmacist) is the father of Pharmacy.
- 'Mahadev Lal Schroff' is the father of Indian Pharmacy.

William Procter Jr.

Prof. Mahadev Lal Schroff

- Traditionally perceived as the art and science of drug/medicine production, the term "Pharmacy" finds its roots in the Greek word 'PHARMAKON', signifying drug.

- In ancient times, physicians themselves practiced pharmacy, with Hippocrates, the esteemed Greek physician and father of Medicine, believed to have formulated his own prescriptions or at least supervised their preparation.
- The historical term 'Apothecary' denoted a medicine professional who formulated and dispensed medicines; a role now fulfilled by pharmacists. The earliest pharmacies were referred to as Apothecary shops.
- Pharmacists played a crucial role in compounding a wide array of medicinal needs, such as mixtures, ointments, pills, tinctures, syrups, elixirs, and powders, based on physicians' prescriptions. They packaged and labeled these medicines, providing appropriate advice for their consumption.
- In ancient times, physicians diagnosed using direct crude drugs, and pharmacists supplied herbs and drugs, identifying them based on morphological appearances and organoleptic characteristics.
- In India, pharmacy was an integral part of the Ayurvedic and Siddha systems of medical practice, similar to other countries. Over time, pharmacy has transformed from an age-old profession into a hub for global healthcare, evolving into a multidisciplinary and multifaceted field with numerous opportunities for services.

B. History of the Profession of Pharmacy in India in Relation to Industry

1. **Formulation Development**
   - Commercial drug production poses challenges for pharmaceutical companies, and pharmacy plays a pivotal role in easing the process.
   - Developing a comprehensive understanding of the form and structure of drug substances and products is facilitated by pharmacists.
   - They are actively engaged in formulation testing, ensuring the successful combination of Active Pharmaceutical Ingredients (API) with inactive excipients.
   - Physicochemical analysis aids in excipients selection, assesses the stability of drug substances and products, and identifies critical material attributes (CMAs) for formulation performance within the defined design space for downstream manufacturing controls.
2. **Manufacturing Department**
   - The success of manufacturing units relies on proper equipment, procedures, and suitable conditions, decisions often made by pharmacists.
   - They create and maintain Standard Operating Procedures (SOP), providing effective training to production staff. Pharmacists also establish sanitation and hygiene standards, defining safety areas and environments for manufacturing units.
   - They assist in reviewing production batch records, ensuring all necessary information is present for final approval and release decisions, and actively contribute to research and development projects.

3. **Quality Control and Quality Assurance**
   - Quality Control (QC), managed by skilled pharmacists, involves sampling inspection and testing of raw and packaging materials, release procedures, and documentation in accordance with pharmacopoeia standards.
   - The Quality Control department defines stability testing, evaluates product shelf life, and monitors microbial activity in raw materials and finished products.
   - Quality Assurance (QA) ensures systemic monitoring and evaluation of projects, services, or facilities, guaranteeing that drug quality standards are maintained.
4. **Drug Information**
   - Pharmacists, recognized as drug experts, utilize their extensive academic knowledge to inform about drug composition, formulation, advantages, and disadvantages.
   - They determine the chemical activity of drugs, provide information on drug interactions, and offer comprehensive details on suitable excipients such as coloring agents and flavoring agents.
5. **Regulatory Affairs**
   - Regulatory affairs, a profession emerging from the need to safeguard public health, oversee the safety and efficacy of medicinal products.
   - Pharmacists in regulatory departments provide strategic and technical advice, contributing both commercially and scientifically.
   - They stay updated on evolving legislation, offering guidance on legal and scientific constraints, ensuring compliance in all regions where a company distributes its products.
6. **Sales and Marketing**
   - Sales and marketing are critical factors for industry growth and development. Pharmacists in pharmaceutical marketing serve as a comprehensive information system, updating physicians on the availability, safety, efficacy, and usage techniques of medicines.
   - They play a direct role in understanding public needs and requirements, offering complete information about products to patients and physicians.
   - Marketing management involves analysis, planning, implementation, and control actions, aimed at establishing and maintaining favorable exchanges with target buyers to achieve organizational objectives.

C. History of the Profession of Pharmacy in India in Relation to Pharmacy Practice

- Pharmacy practice is a field within the broader discipline of pharmacy, focused on cultivating the professional roles of pharmacists.
- Its scope encompasses traditional functions like compounding and dispensing medicines, as well as contemporary services in healthcare. These modern

services include clinical roles, such as reviewing medications for safety and efficacy, and providing drug information.

- The roots of pharmacy practice in India trace back to British India in the 19th century when allopathic drugs became accessible through drug stores.
- During the colonial period, the profession was primarily business-oriented, with those trained to sell drugs referred to as drug sellers or dispensers.
- The community pharmacy in pre-independence India operated with little regulation, and there were minimal restrictions on pharmacy practices. Prescribing and dispensing functions were typically carried out by doctors, with assistants handling medication dispensing and compounding tasks, although with ill-defined roles and responsibilities.
- The formal initiation of pharmacy practice in India occurred through the chemist and druggist program in the 1870s, aimed at training students in pharmacy skills.
- Formal training for compounders commenced in Bengal in 1881.
- The initial orientation of the B.Pharm. course at institutions like BHU was industry-focused, but over time, it shifted more towards an industry-oriented approach as the profession expanded.
- The pharmacy practice profession in India has evolved through distinct eras:
  1. **Traditional Era:** Early 20th century, where pharmacists focused on formulating, dispensing, and studying the medicinal properties of natural products.
  2. **Scientific Era:** Post-World War II, marked by the application of a scientific approach to medicine, the emergence of pharmaceutical industries, and the mass production of drugs.
  3. **Clinical Era:** Second half of the 20th century, characterized by education in clinical pharmacy, emphasizing pharmacokinetic parameters and understanding disease physiology.
  4. **Industrialization Era:** 21st century in India, witnessing the development of manufacturing pharmacy, standardization of biologically prepared products, and the significant role of pharmacists in the pharmaceutical industry.
  5. **Pharmaceutical Care Era:** Concurrent with industrialization, this era expanded the role of pharmacists to include monitoring therapy response, patient education, and ensuring positive outcomes with prescribed drug therapy. Pharmacists became actively involved in drug review, monitoring, and dispensing medications.

D. Professional Associations

Some of the renowned important associations and organizations are:

1. **Indian Pharmaceutical Association (IPA)**
   - Established in 1939, IPA stands as the oldest and foremost association of pharmaceutical professionals in India.

- IPA actively contributes to professional development with a membership exceeding 13,000, spanning the nation through 20 state branches and 46 local branches.
- As a member of the Drug Technical Advisory Board (DTAB), IPA provides crucial insights to the government on professional matters.
- Affiliated with international pharma associations such as FIP, FAPA, CPA, AAPS, AAiPS, and collaborating with entities like WHO and WHPA, IPA aims to elevate pharmacists as essential healthcare providers in India.
- Its diverse divisions, including Industrial Pharmacy, Education, Hospital Pharmacy, Community Pharmacy (CPD), and Regulatory Affairs, strive to achieve this objective.
- IPA's notable publications include Pharma Times, Indian Journal of Pharmaceutical Sciences (IJPS), IPA CPD E-Times, and Drug Information Centre Bulletin.
- The association also bestows awards and fellowships, such as Eminent Pharmacist, IRF Lifetime Achievement, IPA Fellowship, Prof. M.L. Khorana Memorial Lecture Award, Dr. M. Venkateswarlu Memorial Lecture Award, Best Branch Awards, IJPS Best Paper Awards, Prof. M.L. Khorana Medal, Prof. M.L. Schroff Medal, and IPAACG 2 SciTech Innovation.

2. **All India Organization of Chemists and Druggists (AIOCD)**
   - Representing approximately 8.5 lakh retail and wholesale chemists nationwide, AIOCD is acknowledged as the sole authentic representative body of the pharmaceutical trade in India.
   - Devoted to ensuring the safety, security, and prosperity of chemists, AIOCD aids in broadening their knowledge, addresses issues with government authorities, and prepares members to navigate challenges arising from changes in the trade environment, including GATT, TRIPS, EMR, mergers, acquisitions, and co-marketing.
3. **Indian Drug Manufacturers Association (IDMA)**
   - Established in 1961 with a commitment to providing safe, efficacious, and affordable quality medicines, IDMA is the voice of the Indian Pharma manufacturing sector.
   - Boasting a membership of over 1000 Indian industries and State Boards, IDMA contributes significantly to the industry's growth.
   - The association publishes various informative materials, including IDMA Bulletin, Indian Drugs, IDMA Annual Publication, IDMA-APA Forum, and Technical Monographs.
   - IDMA organizes conventions, seminars, and training programs, recognizing excellence in the education profession through awards like IDMA Quality Excellence Awards, IDMA Margi Best Patent Award, IDMA Corporate Citizen Award, IDMA Best Research and Review Article Award, IDMA J B Mody Awards, IDMA-APA Eminent Analyst Award, and IDMA-APA Outstanding and Young Analyst Awards.

4. **All India Cosmetics Manufacturers' Association (AICMA)**
   - Established in 1964, AICMA serves as the exclusive cosmetic association in India.
   - Its primary objectives include promoting and safeguarding the small-scale cosmetic industry, as well as representing the concerns of its members to the authorities.
5. **CSIR-Central Drug Research Institute (CSIR-CDRI)**
   - Founded in 1951, CSIR-CDRI is committed to advancing drug research and development in the country.
   - With notable achievements, including the discovery and development of 12 new drugs, CSIR-CDRI focuses on creating new drugs and technologiesfor affordable healthcare, sharing knowledge, and nurturing future leaders in the healthcare sector.
6. **Central Drugs Laboratory (CDL), Kolkata**
   - Tasked with analytical quality control, CDL, Kolkata ensures the quality of imported drugs available in the Indian market and those manufactured within the country. It serves as an appellate authority in disputes related to drug quality.
7. **Central Drugs Standard Control Organization (CDSCO)**
   - Operating under the Directorate General of Health Services, Ministry of Health and Family Welfare, CDSCO serves as the national regulatory authority of India.
   - With headquarters in New Delhi and several regional offices, CDSCO approves drugs, conducts clinical trials, sets standards for drugs, oversees the quality of imported drugs, and coordinates activities with state drug control organizations to enforce the Drugs and Cosmetics Act (DCA) and rules.
8. **National Pharmaceutical Pricing Policy (NPPA)**
   - As part of the Government of India, NPPA was established to regulate and revise the prices of controlled bulk drugs and formulations.
   - It ensures the availability of medicines at reasonable levels by monitoring the prices of decontrolled drugs.
9. **Indian Pharmacopoeia Commission (IPC)**
   - Operating as an autonomous institution under the Ministry of Health, Government of India, IPC regularly updates drug standards for commonly required treatments.
   - IPC publishes official documents, such as the Indian Pharmacopoeia (IP) and the National Formulary of India, to improve the quality of medicines and promote the rational use of generic drugs.
10. **Bulk Drug Manufacturers Association (BDMA)**
    - Formed in 1991, BDMA serves as an all-India body catering to the needs of the bulk drug industry.

- It works towards consolidating industry gains and acts as a liaison between the government and the industry on various issues for growth.

PHARMACY AS A CAREER

- Pharmacy has evolved to organize educational programs and research activities aimed at spreading awareness and establishing the importance of quality standards for drugs and related materials.
- Pharmacists, as integral figures in the healthcare system, assume various roles such as academic pharmacists, industrial pharmacists, community pharmacists, clinical pharmacists, hospital pharmacists, and veterinary pharmacists.
- Regardless of their specific field, all pharmacists are directly or indirectly linked to the nation's health. Their ultimate responsibility is to ensure that the "right drug is provided to the right patient at the right time, in the right dose, through the right route, in the right way," underscoring their pivotal role in healthcare.

1. **Clinical Pharmacist**
   - In the realm of general and clinical practice, clinical pharmacists utilize their expertise in medications to contribute to individual patient medication plans, assessing factors such as dose appropriateness, side effects, efficacy, and potential drug interactions.
   - They often work directly with patients, aiding in their understanding of prescribed medications and encouraging adherence to dosage instructions. Monitoring patient progress, making relevant recommendations for adjustments, and evaluating medication therapy are all part of the clinical pharmacist's responsibilities.
   - As per new government regulations, pharmacists can also establish their clinics, providing primary treatment and managing emergency conditions in the absence of doctors.
2. **Academic Pharmacist**
   - In academic practice, pharmacists focus on teaching, research, and training the next generation of pharmacists. Based on their knowledge and skills, pharmacists are appointed to various posts in academic institutes.
   - Through seminars, projects, and systemic academic initiatives, pharmacists play a valuable role in the healthcare system.
   - Education serves as motivation for professionals in the healthcare sector. From basic education and pre-registration training, students gain a comprehensive understanding of the scientific principles and techniques of pharmaceutical sciences, enabling them to stay abreast of developments in medicine and pharmacy throughout their careers.
   - Pharmacists also impart knowledge about the preparation, distribution, action, and uses of drugs.
   - Educational training programs contribute to the continuous professional development of healthcare professionals, providing specialized knowledge in drugs and therapeutic actions through practical training.

- Academic pharmacists play a crucial role in laying the foundation for the pharmacy profession.

3. **Hospital Pharmacist**
   - Hospital pharmacists play a pivotal role in overseeing the supply of all medicines within the hospital. They are responsible for procurement, manufacturing, dispensing, and quality testing of medications, often with support from pharmacy assistants and technicians.
   - These pharmacists provide information on potential side effects, ensure medication compatibility, and monitor treatment effectiveness. Like doctors, they actively participate in ward rounds and are deeply involved in selecting treatments for patients.
   - Some pharmacists specialize as consultants in areas such as hematology, nephrology, cardiology, urology, pediatrics, diabetes, and infectious diseases. They contribute to prescribing, dispensing, administration, documentation, and monitoring.
4. **In Pharmacovigilance**
   - The word "Pharmacovigilance" stems from "pharmakon" meaning drug and "vigilar" to keep watch.
   - Pharmacovigilance involves the detection, assessment, understanding, and prevention of adverse effects or any other medicine/vaccine-related issues.
   - Pharmacovigilance focuses on identifying hazards associated with pharmaceutical products and minimizing risks to patients.
5. **In Research and Development**
   - Pharmacists play a crucial role in research, particularly in formulation development that influences the biological availability of active ingredients.
   - They conduct experiments, develop drug formulations, design convenient dosage forms, and maintain drug registers.
   - Pharmacists decide on suitable excipients for Active Pharmaceutical Ingredients (APIs) and contribute to the development of combination drugs.
6. **In Pharmaceutical Marketing and Management**
   - Pharmacists participate in marketing and distribution, providing knowledge about drugs to physicians.
   - Pharmaceutical marketing includes advertising, news dissemination, and multimedia components.
   - Management in the pharmaceutical industry involves regular drug checkups, temperature maintenance, moisture regulation, light control, and other factors. Pharmacists contribute to ethical management policies at all levels.
7. **Chemist or Community Pharmacist**
   - Pharmacists are authorized to open their chemist shops, where they check prescriptions, dispense drugs, and offer advice on drug selection and usage. Also known as community pharmacists, they are directly connected with the public, providing comprehensive information about diseases.

- Community pharmacists are expanding their clinical roles, including the management of conditions such as asthma, diabetes, blood pressure testing, smoking cessation support, dietary advice, and reproductive health counseling.

8. **In Industry**
   - Pharmacists are involved in a wide range of activities in the pharmaceutical industry, encompassing the drug discovery process, drug safety studies, formulation of dosage forms, clinical trials, marketing, and management.
   - Their roles in the industry include formulation development, managing manufacturing departments, ensuring quality control and quality assurance, engaging in sales and marketing, and contributing to management practices.

PHARMACOPOEIA/FORMULARIES/COMPENDIA

- Books that set standards for drugs and related substances are known as pharmacopoeia and formularies. Collectively, these books are referred to as drug compendia.
- Pharmacopoeias or formularies provide information on drugs and related substances, including their source, descriptions, standards, tests, preparation formulas, actions and uses, doses, storage conditions, etc.
- These books are authorized by the respective governments and are revised periodically to incorporate the latest information.
- To manage the size of the book, certain less frequently used drugs and pharmaceutical adjuvants are omitted, and new monographs are added in each edition.
- The preparation of these books involves obtaining expert opinions from medical practitioners, teachers, and pharmaceutical manufacturers.

Classification: The drug compendia are classified into two types:

a. Official compendia
b. Non-official compendia

a. **Official Compendia**
   - Official compendia consist of drugs and related substances recognized as legal standards of purity, quality, and strength by government agencies in their respective countries of origin.
   - Examples include the British Pharmacopoeia (BP), British Pharmaceutical Codex (BPC), Indian Pharmacopoeia (IP), United States Pharmacopoeia (USP), National Formulary (NF), State Pharmacopoeia of the USSR, and pharmacopoeias of other countries.

b. **Non-Official Compendia**
   - Non-official compendia refer to books, other than official drug compendia, used as secondary reference sources for drugs and related substances.
   - Examples include Merck Index, Extra Pharmacopoeia (Martindale), United States Dispensatory, etc.

Indian Pharmacopoeia

A. **History of Indian Pharmacopoeia**

- The history of Pharmacopoeia in India dates back to 1563, credited to Garcia da Orta, a Portuguese physician and teacher.
- The idea of an indigenous Indian Pharmacopoeia emerged in 1837 and materialized in 1841 with the Bengal Pharmacopoeia and Conspectus of Drugs.
- The Hindustani version of the London Pharmacopoeia became available in India from 1901. The Indian Pharmacopoeia List, published in 1946, laid the groundwork for the official Indian Pharmacopoeia, published in 1955.
- The process began in 1944 when the Indian government tasked the Drugs Technical Advisory Board with preparing a list of drugs used in India.
- The Indian Pharmacopoeia List 1946 categorized substances included and not included in the British Pharmacopoeia, covering crude drugs, chemicals, preparations, drugs of plant and animal origin, biological products, insecticides, coloring agents, synthetics, miscellaneous items, and drugs for veterinary use.
- The official Indian Pharmacopoeia was published in 1955, following this groundwork
- In the compilation of the Pharmacopoeia of India, reference was made to the pharmacopoeias of various countries, including the British, European, United States, USSR, and Japan, as well as the National Formulary (USA) and Merck Index.
- Collaboration extended to individuals from the pharmaceutical industry, drug control laboratories, and research and teaching institutions.
- The Indian Pharmacopoeia, governed by the Drugs and Cosmetics Act 1940, serves as the official guide containing standards for drugs and related substances, mandating compliance by pharmaceutical manufacturers.

Table 1.1: History of development of Indian Pharmacopoeia

S.No.	Edition of Pharmacopoeia	Year of Publication
1.	First Edition	1955
2.	Supplement	1960
3.	Second Edition	1966
4.	Supplement	1975
5.	Third Edition	1985
6.	First Addendum	1989
7.	Second Addendum	1991
8.	Fourth Edition	1996
9.	First Addendum	2000

(*Contd.*)

(*Contd*.)

S.No.	Edition of Pharmacopoeia	Year of Publication
10.	Second Addendum	2002
11.	Fifth Edition	2007
12.	Sixth Edition	2010
13.	Seventh Edition	2014
14.	Eighth Edition	2018

B. Salient Features of Indian Pharmacopoeia

- The Indian Pharmacopoeia (IP) is consistently published in alignment with the mission of the Indian Pharmacopoeia Commission (IPC) to enhance public health by ensuring the quality, safety, and efficacy of medicines.
- I.P provides procedures for analysis and specifications for evaluating the quality of pharmaceutical substances, excipients, and dosage forms.
- General chapters on volumetric glassware, conductivity, dissolution test, disintegration test, dimensions of hard gelatin capsule shells, etc., have undergone revisions.
- I.P has broadened its scope to encompass products of biotechnology, indigenous herbs, herbal products, veterinary vaccines, additional antiretroviral drugs and formulations, including commonly used fixed dose combinations (FDC).
- I.P includes 170 chemical monographs, 15 herbal monographs, 10 blood and blood-related product monographs, 6 biotechnology monographs, 3 pharmaceuticals monographs, 2 vaccines and immune sera monographs, and 14 veterinary and non-biological product monographs.
- Monographs provide comprehensive details, including definition, description, identification, packaging, storage, specifications, impurities, assay and specific tests, and acceptance criteria.
- General chemical tests and TLC for identification have been minimized, emphasizing more specific methods like infrared, ultraviolet spectrophotometer, and HPLC tests.
- Chromatographic methods are extensively employed for increased specificity in assays and assessing the nature and extent of impurities in ingredients and products.
- Methods for controlling the microbial quality of medicinal products have been updated, with pyrogen tests replaced by the Bacterial Endotoxin Test (BET) in parenteral preparations.

The British Pharmacopoeia (BP)

- Under the Medical Act of 1858, the General Council of Medical Education and Registration was given the authority to change, edit, and reprint the British Pharmacopoeia (BP) as needed.

- The first BP was issued in 1864.
- In 1926, the Committee of Civil Research advised forming a Pharmacopoeia Commission to oversee new editions of BP and revising and reissuing it every 10 years.
- In 1932, a new version of BP was issued based on the aforesaid proposal.
- The Medicines Commission was responsible for drafting the BP under the Medicines Act of 1968. The Medicines Commission reformed the British Pharmacopoeia Commission and delegated responsibilities to the British Pharmacopoeia Committee.
- In 1980, the 13th edition of BP was published.
- In 1988, the fourteenth edition of BP was released.
- In 1993, the fifteenth issue of BP was released.
- BP 1988 has two volumes and 2100 monographs:
  i. Volume I includes monographs on medicinal and pharmaceutical compounds, as well as IR reference spectra.
  ii. Volume II covers formulated preparations, blood products, immunological products, radiopharmaceutical preparations, surgical materials, and appendices.
- BP is the source of drug standards in the United Kingdom and other Commonwealth countries.

The United States Pharmacopoeia (USP)

- The USP was published in 1820 by the United States Pharmacopoeial Convention.
- The United States Pharmacopoeial Convention bought the NF in 1974, and since 1980, only one official book of drug standards has been published under the title The United States Pharmacopoeia and the National Formulary (USP-NF).

National Formulary of India

- The National Formulary of India has been developed to assist medical practitioners, medical students, and chemists working in hospitals and sales departments.
- The first version was issued in 1960 by the Government of India's Ministry of Health.
- In 1966, a second edition was issued.
- In 1979, the third edition was published.
- It discusses medication interactions, resistance, cumulative effects, drug dependency, prescription writing, and other topics.

Extra Pharmacopoeia

- William Martindale created the Extra Pharmacopoeia in 1883, and it is still known as 'Martindale'.
- This is an authorized drug reference book that is widely used across the world.
- It gives up-to-date information about pharmaceuticals and medications.
- The Royal Pharmaceutical Society of Great Britain's Council directs its publication, which is created in the Society's Department of Pharmaceutical Sciences.