



Pharmacy & Career Opportunities

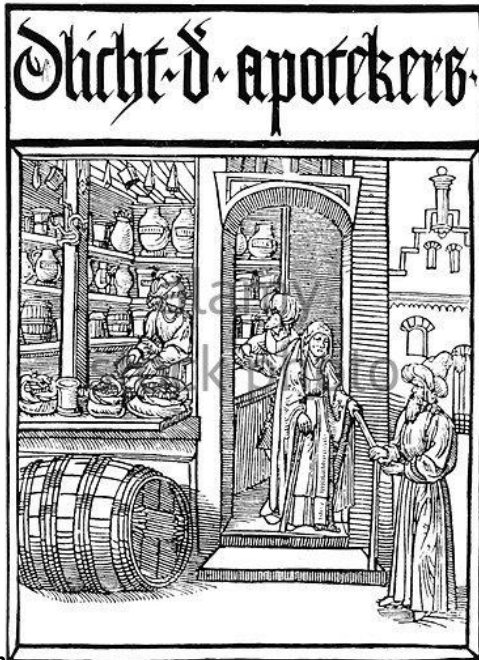


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Definition of Pharmacy

Pharmacy: Derived from the Greek word **Pharmakon** means medicine or drug.



Pharmacy: Is the art and science of **preparing, dispensing and proper utilization** of medications and the provision of drug-related information to the public.



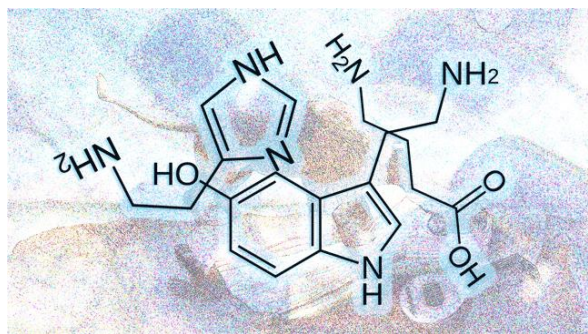
Types of education necessary for pharmacists

- **Basic science (Chemistry, Biology, Physics)**
- **Clinical studies**
- **Technical Skills**
- **Drug information and scientific knowledge**
- **Economic knowledge**
- **Psychological and sociological understanding**



Aims of modern pharmaceutical education

- Provide scientific background
- Provide professional skills and knowledge
- Provide business training
- Provide broad general education



Scope of Pharmacy

Interpretation of prescription orders

ASK THE
PHARMACIST

Rx

Compounding

Labeling

Dispensing of drugs and devices

Drug product selection and drug utilization reviews

Patient monitoring and interventions

Provision of information of medications and devices



Pharmacy Profession



**A
knowledge-
based
profession**

**A health-
care
profession**



Carreer Oppurtunities in Pharmacy



WHAT DOES A
PHARMACIST REALLY DO?



**Community
pharmacist**

Hospital pharmacist

Clinical pharmacist

Industrial pharmacist

Phytopharmacist

**Academic (research)
pharmacist**



Community Pharmacy

A bridge between patient and doctor / drug

Through the services of community pharmacy a Pharmacist becomes a vital link between the patients and the products i.e., drugs.

The pharmacist also serves a vital link between the patients and other healthcare professionals, especially the medical experts.



Community Pharmacy



Interpret Drug Interactions

Pharmacists look at all possible interactions between not only prescriptions, but also over the counter, herbals, and supplements, so be sure your pharmacist knows *everything* you're taking.

Counsel on Prescriptions

Whether handing you a new prescription in your community pharmacy or visiting your room in the hospital, pharmacists explain what you need to know about your medication and answer any questions, so ask away!

Make Medication Information Understandable

We know you don't need to know everything, so we determine what is important to you, such as how to use a medication, when to expect results, and what to do if you experience side effects.

Provide Vaccines

Pharmacists give vaccines that prevent serious diseases, such as the flu, shingles, and pneumonia.

OTC Counseling

Pharmacists also know about the over the counter (OTC) and natural products out there, so the next time you're not how to treat your cold symptoms or if you should try glucosamine for your arthritis, talk to your pharmacist.

Help You Stay Out of the Hospital

Whether it's in an emergency room, hospital, nursing facility, or at home, pharmacists are key partners in ensuring that you and your providers are up to date about your medications



Manage Chronic Diseases

Diabetes, high blood pressure, high cholesterol...pharmacists know about treating these conditions and can be a valuable resource between physician visits. We can also help you figure out what to do when a problem arises.

Help You Quit Smoking

Pharmacists are knowledgeable about tobacco use, and can offer you support and encouragement, as well as recommend options to help you quit.

Make it Easier to Take Your Medication

Pharmacists help pinpoint why it might be hard to take your medication as prescribed (whether it's keeping you up at night or you simply forget to take it) and recommend strategies to help you remember to take your medication.

Stay Up to Date on What Matters to You

We follow all the latest science, and filter through new updates to find out what will impact you.

Verify, Prepare, and Check Medication

Pharmacists ensure the medication is right for you based on your medical condition and lifestyle. Then they check the medication, dose, and instructions to be sure you receive the right drug for you.

Wellness Screenings

Many pharmacies will offer screening for blood pressure, cholesterol, and diabetes, and can help you figure out what to do next if there is a problem.

PHARMACY

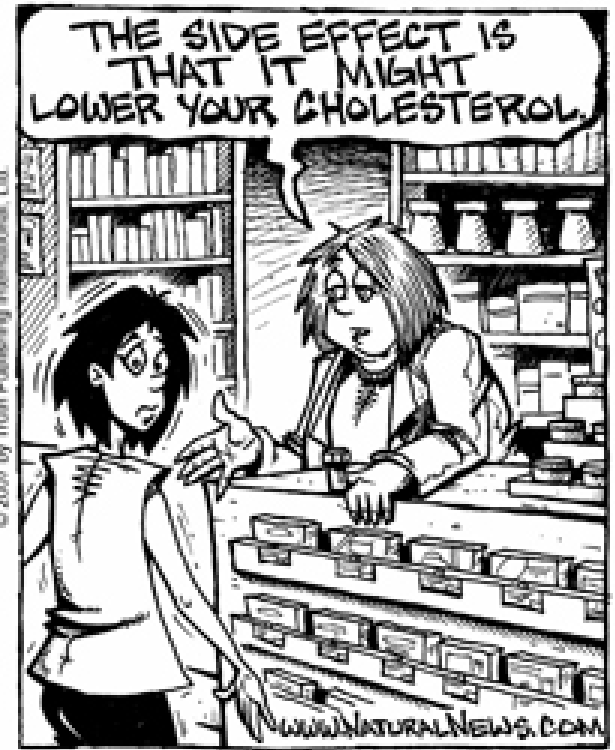
Advising/Helping the Patients



Community Pharmacist

Advising/Warning the Patients

COUNTERTHINK



Community Pharmacist

- ✓ Constantly learning and studying about properties & side effects of new drugs.
- ✓ Communicate with doctors & patients



Community Pharmacist



Good Dispensing Practice (GDP)

Proper labeling



Proper storage

- Label it properly and check for expiry date.
- Clean and organize the working area.
- Proper recording of the drugs (inventory control)



Role of the Compounding Pharmacist

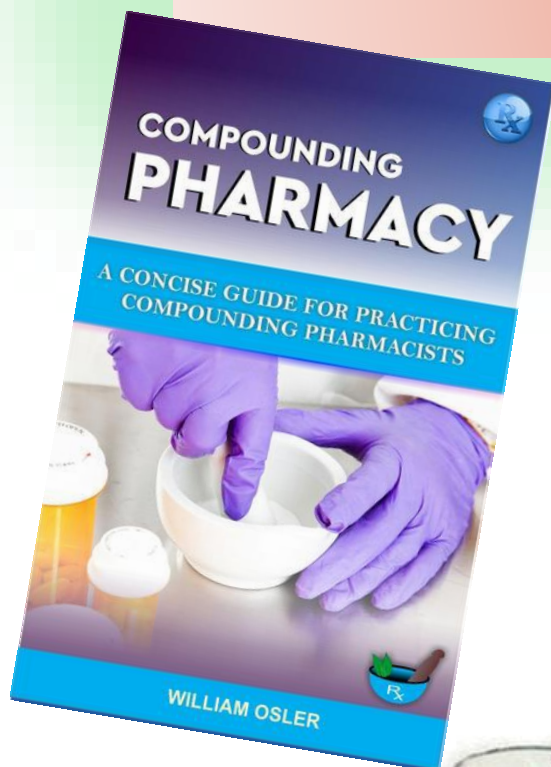


**H
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r
y**

- **The Community Pharmacy**
 - Its estimated the 80% of prescriptions dispensed in 1920's were still compounded.
 - They used chemicals purchased to make own prescriptions.
 - Called to provide first aid and medicines for common ailments Ex: Burns, frostbite, poisoning etc.

Role of the Compounding Pharmacist

“Individualizing Drug Therapy”



The preparation, mixing, assembling, altering, packaging, and labeling of a drug, drug-delivery device or device in accordance with a licensed practitioner’s prescription, medication order, or initiative based on the practitioner/patient/pharmacist/compounder relationship in the course of professional practice...



Extent of Compounding in the U.S.

- More than 70% of pharmacies report they do some compounding
- Virtually all hospitals do compounding
- All government hospitals compound
- Even chain stores have compounding centers

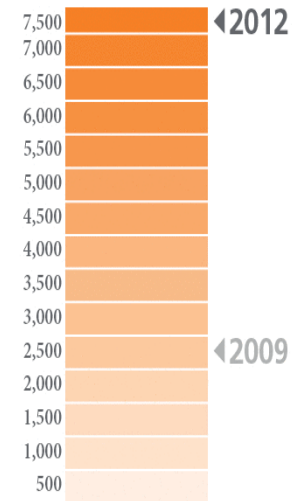


Reasons for the Growth of Pharmacy Compounding

- Limited dosage forms
- Limited strengths
- Nonavailable drug products/combinations
 - Discontinued Drugs
 - Drug Shortages*
- Orphan drugs
- Veterinary compounding
- New therapeutic approaches
- Special patient populations



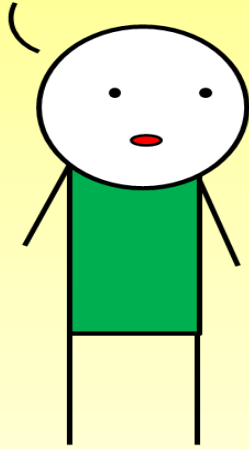
Compounding pharmacies expanding



Based on OptumRx analysis, summer, 2013.

By 2012 there were some 7,500 pharmacies in US that specialized in compounding, a 200% increase in only four years.

Wha do you do?

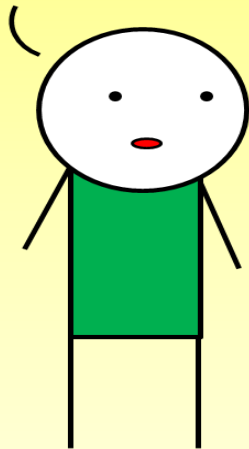


I'm a pharmacist



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So basically you're a
salesman



Basically you're an idiot




Industrial Pharmacy

Industrial pharmacy may be defined as the science and technology of producing pharmaceuticals (medicinal substances and their dosages) efficiently and economically on the commercial scale in industry.



europaean INDUSTRIAL PHARMACY



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regulars

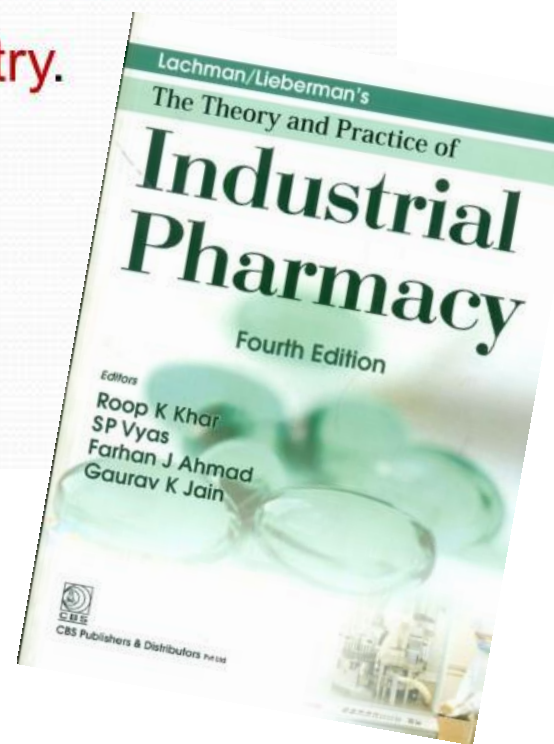
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PHARMACEUTICAL INDUSTRY JOBS FOR PHARMACISTS



**MEDICAL SCIENCE LIAISON
MEDICAL DIRECTORS
HEALTH OUTCOMES
MEDICAL INFORMATION
DRUG SAFETY
REGULATORY
RESEARCH
SALES
MARKETING**



Industrial Pharmacist

Industrial Pharmacy

- Pharmacist working in manufacturing department is responsible for **developing a cost saving and high efficient techniques**. He is also responsible for **the safety and health of workers**.



Industrial Pharmacy

- Pharmacist working in quality control (QC) department is responsible for **analysis of drug** in the pharmaceutical dosage form. He is also responsible for **the drug analysis of raw materials and degradation products**.



Industrial Pharmacist

Role of Pharmacists in Pharma / Biotech Industry

- **Research & Development** — Drug discovery, Reverse Engineering, Formulation & Process Development, Up scaling, Stability and Packaging Development
- **Production** — Production of bulk drugs, intermediates, Finished dosage forms (traditional and alternate medicines)
- **Quality Control** — Product testing through out the product life cycle
- **Quality Assurance** — Preparing, receiving and submitting written documents
- **Marketing** — Strategic planning, team management and ethical product promotion



"It's an experimental drug. We're still testing to see how much customers will pay for it."



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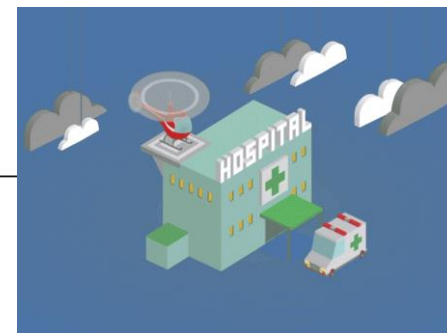
Hospital Pharmacist

- Works in hospitals, clinics.
- Advise the medical staff on the selection & effect of drugs, monitor patient's drug regimens, & evaluate drug use patterns in the hospital.
- commonly specialize in specific aspects of drug therapy, i.e. Oncology, Drug Information, Radiopharmaceuticals, or Pediatrics.



Hospital Pharmacist

1- Supply & dispensing	- Medicines supply to inpatients & outpatients - Medical gases supply - Cytotoxic dispensing
2- Provide services	- Clinical pharmacy - Drug Information services
3- Committees	- Pharmacy & Therapeutic Committee - Infection Control Committee.
4- include special units	- Total Parental Nutrition TPN



Hospital Pharmacist

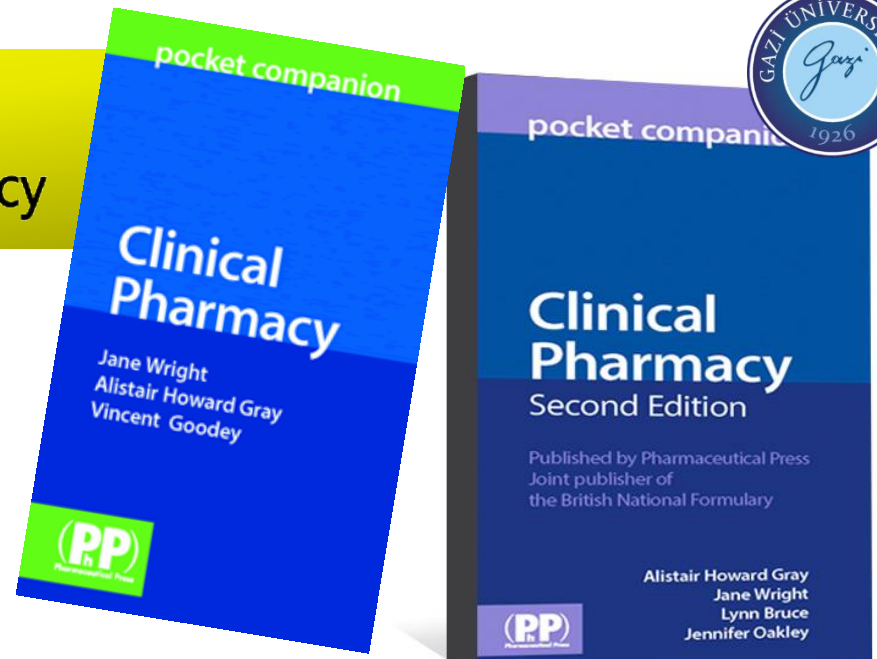
- Some pharmacists working in hospital pharmacy are specialized in:
 1. Nuclear pharmacy (radiopharmaceuticals)
 2. Intravenous medications
 3. Poisoning center
 4. Infectious diseases



Clinical Pharmacy



Clinical pharmacy is defined as the branch of pharmaceutical science dealing with utilization of pharmacist knowledge, skills and judgments related to biomedical and pharmaceutical sciences, to prove the safety, the cost and the precision of the drug usage in the patient care.

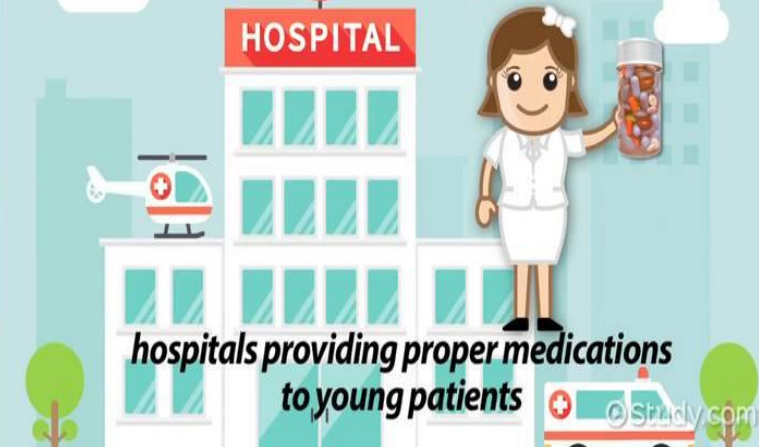


Clinical Pharmacy Practice areas

- Ambulatory care
- Critical care
- Drug Information
- Geriatrics and long-term care
- Internal medicine and subspecialties
- Cardiology
- Endocrinology
- Gastroenterology
- Infectious disease
- Neurology
- Nephrology
- Obstetrics and gynecology
- Pulmonary disease
- Psychiatry
- Rheumatology
- Nuclear pharmacy
- Nutrition
- Pediatrics
- Pharmacokinetics
- Surgery

PEDIATRIC CLINICAL PHARMACISTS

Pediatric clinical pharmacists



*hospitals providing proper medications
to young patients*

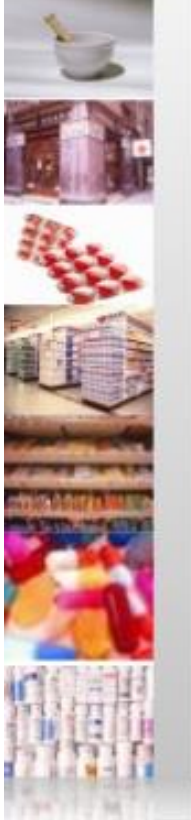
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Clinical Pharmacist



THE CLINICAL PHARMACIST

How does clinical pharmacy differ from pharmacy?



The discipline of pharmacy embraces the knowledge on synthesis, chemistry and preparation of drugs

Clinical pharmacy is more oriented to the analysis of population needs with regards to medicines, ways of administration, patterns of use ,drugs effects on the Patients,
'the overall drug therapy management'.

The focus of attention moves from the drug to the single patient or population receiving drugs.

Clinical Pharmacist

Medication Review

Review medication chart, Review medication history

Attending Rounds

Drug use studies and research

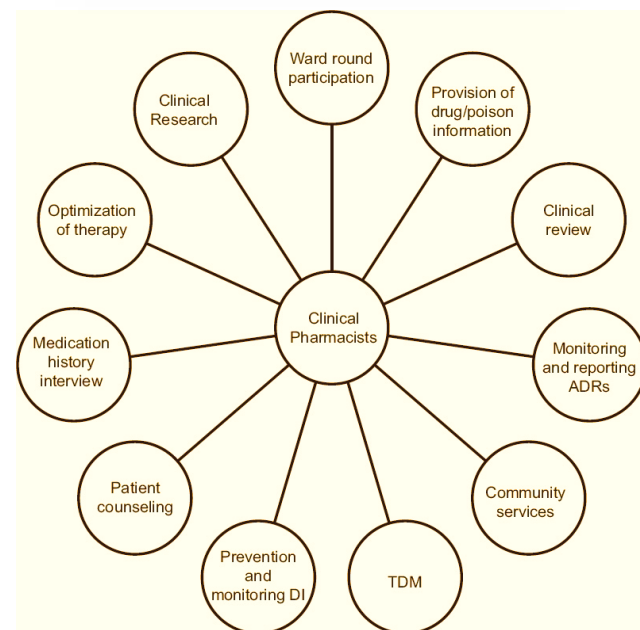
Drug use studies/ pharmacoepidemiology/ outcome research/ pharmacovigilance and vigilance in medicinal devices: collecting data on drug therapies, their costs and patient outcome through structured and scientific methods.

Pharmacokinetics/ therapeutic drug monitoring

Studying the kinetics of drugs and optimising the dosage.

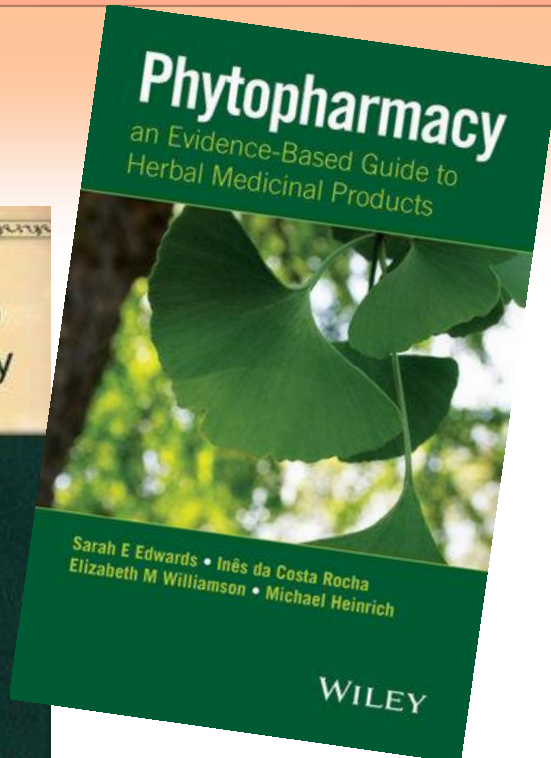
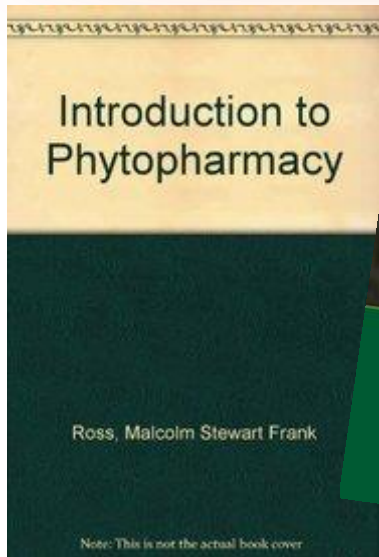
Clinical Trials

Planning, evaluating and participating in clinical trials



Phytopharmacy

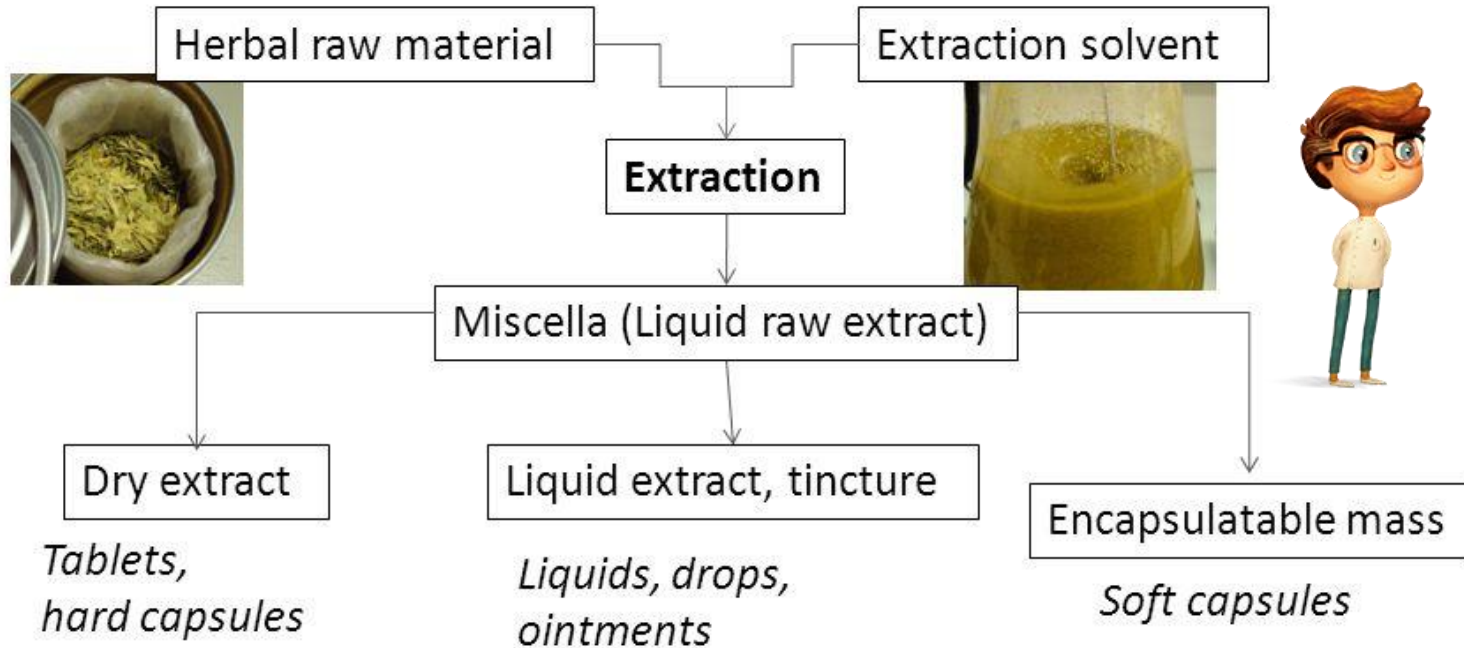
There is a clear need to offer balanced, well-informed advice to patients, yet a number of studies have shown that, generally, conventionally trained health practitioners consider their knowledge about herbal medicinal products and supplements to be weak.



Phytopharmacy fills this knowledge gap, and is intended for use by the busy pharmacist, nurse, or doctor, as well as the 'expert patient' and students of pharmacy and herbal medicine.

Phytopharmacy

Process development – in phytopharmacy



Development of the test substance

- Define:
- Active substance (*in phytopharmacy: native extract*)
 - Dosage form
- Establish:
- Physico-chemical profile (pKa, and solubility; permeability) of active compounds
- Investigate:
- Pharmacology, - Mode of action

Phytopharmacy

Pharmacists' roles are evolving in phytopharmacy as herbal medicine experts within a multidisciplinary health care team.



Hospital / Drug
Counseling Services
/ Emergency



Research and
development
(Pharmaceutical
Industry)



Academia



Radiopharmacy/Nuclear Pharmacy

NUCLEAR PHARMACY



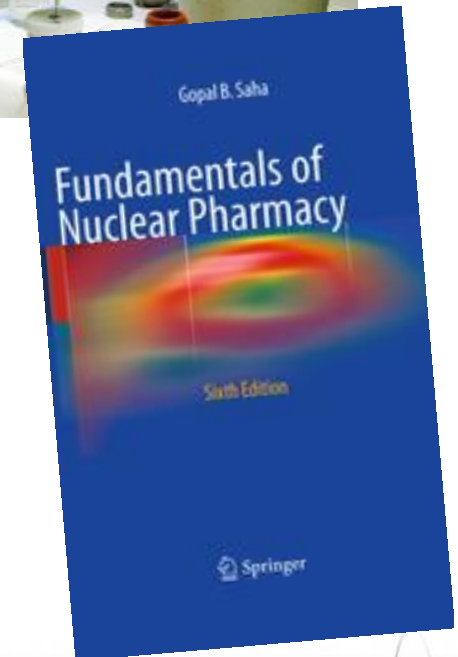
- The development of nuclear pharmacy as a specialty area followed the development of nuclear medicine as a recognized specialty by the American Medical Association in the early 1970's.



What is Radiopharmacy?

Radiopharmacy = Nuclear Pharmacy

Nuclear pharmacy is a specialty area of pharmacy practice dedicated to the compounding and dispensing of radioactive materials for use in nuclear medicine procedures.”



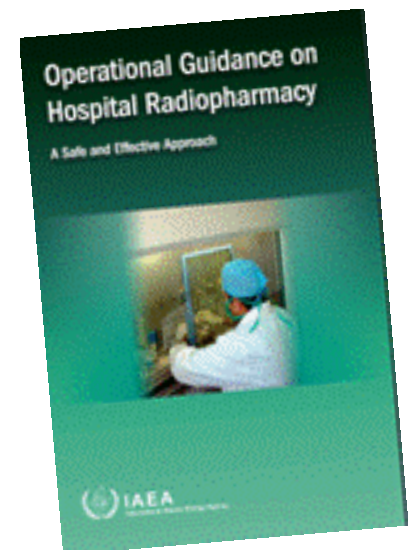
Radiopharmacy/Nuclear Pharmacy

- Specialty area of pharmacy practice dedicated to the compounding and dispensing of radioactive materials;
- Traditional pharmacist dispenses tablets and capsules, a **nuclear** pharmacist dispenses the radioactive material in liquid or capsule form;
- Nuclear pharmacists serve as vital links in the provision of nuclear medicine services.



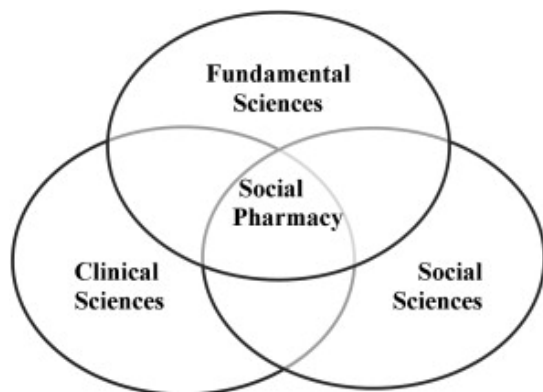
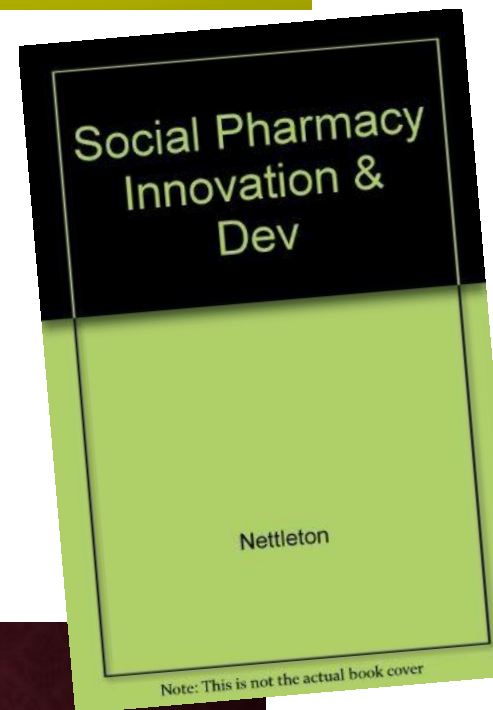
Radiopharmacy/Nuclear Pharmacy

- Allied to Nuclear medicine and medical physics.
- Fundamentally the preparation of radioactive substances for therapeutic, diagnostic and research uses.
- Crucial to the above-mentioned applications - no other professional is qualified to prepare such substances. If you were a patient who else would you choose to prepare your radiotherapeutic medicine!
– Doctors or nurses??
- A specialist discipline, requires “Specials” licensure ∴ Highly regulated!
- Role encapsulates various critical responsibilities:
 - Highly specialised technical preparation, Health and safety, Quality control, and storage.
- Important in the research, development and testing of non-radiotherapeutic drugs such as those that act within the brain.
- An exiting area given the specialist knowledge and skills required!



Social pharmacy

- Traditionally, chemistry, biochemistry, physics and physiology form Pharmacy's core knowledge base.
- Knowledge of medications and their effects is the basis of the pharmacists' professional expertise.
- Practicing pharmacy, however, is carried out among human beings, the persons referred to as customers or patients or users. They, in turn, are connected with one another in families, organizations and health systems in countries and cultures around the world.



SOCIAL PHARMACY

- “Social Pharmacy is the interdisciplinary discipline that enables the pharmacy profession to act, take part and take responsibility in drug matters at a societal level”

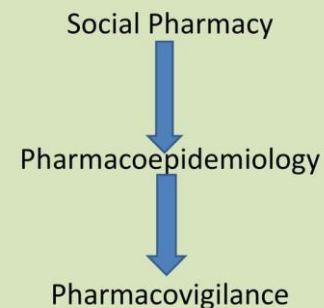


Social pharmacy

- Explain rational drug use with its importance
- Define the term Essential Drug Concept
- Some understanding on national drug policy
- Common problems associated with drug use
- Pharmacists role in promoting rational drug use.
- Guidelines for rational prescribing

Pharmaceutical Sociology (Social Pharmacy)

- Concerned with the social institution of pharmacy & society as it relates to patients, medicines, & the work of the pharmacist



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Social pharmacy

Within Social Pharmacy, the drug/ medicine sector is studied from the social scientific and humanistic perspectives.

• “The primary pursuit of Social Pharmacy research is to investigate questions and themes concerning pharmacy practice and medicine use.”

- Topics relevant to Social Pharmacy consist of all the social factors that influence medicine use, such as
- medicine- and health- related beliefs,
- attitudes,
- rules, relationships,
- and processes.



Social pharmacy

How do laws influence development and approval of new drug products?

What is the influence of a newly developed product on health and health economics?

How is drug distribution carried out in countries that have different education and availability of pharmacists?

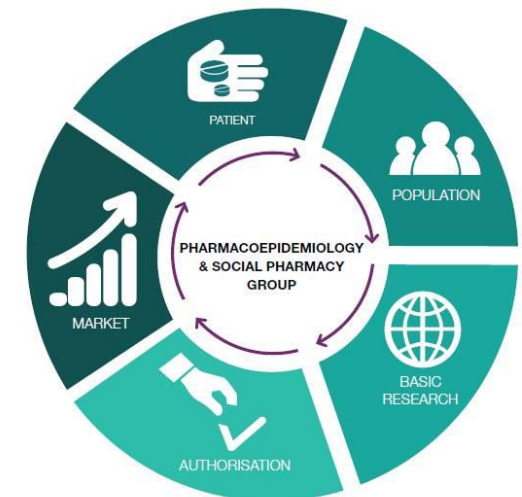
How do pharmacists perceive and act upon their expanded roles in health care delivery?

Social pharmacy

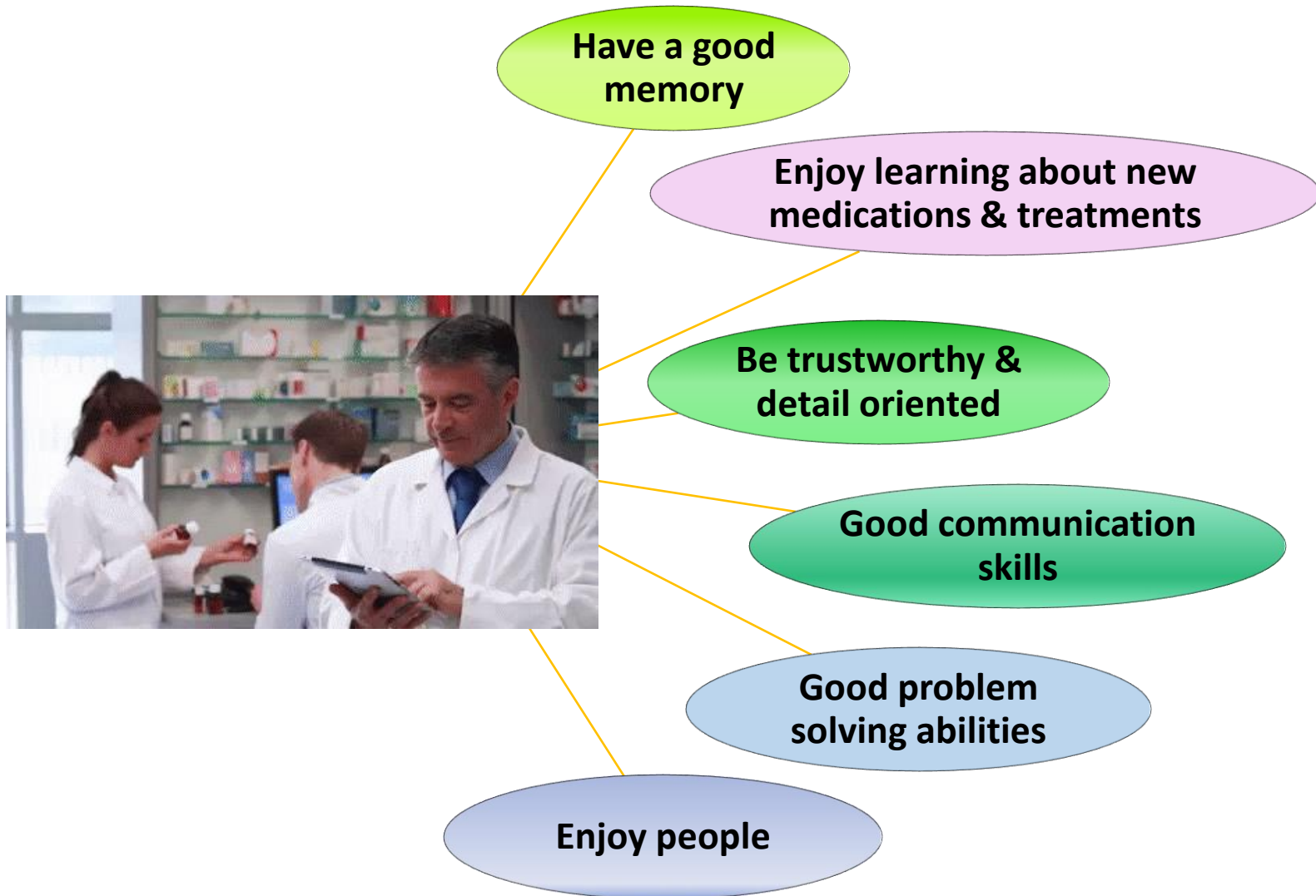
- Social Pharmacy may be defined as the discipline dealing with the role of medicines from social, scientific and humanistic perspectives.
- It draws on theories of the social and behavioral sciences, including health psychology.
- Social Pharmacy may be seen as consisting of all social factors influencing the use of a particular drug, such as medicine-related beliefs, regulations, policy, attitudes, medicine information, ethics and behavior.

Table 2: The Presence of the Social Pharmacy Department or Similar, N=51

Region	Europe		North America		Developing Countries	
Yes	10	52,6%	6	37,5%	5	31,25%
No	8	42,1%	10	62,5%	11	68,75%
No answer	1	5,3%	0	0%	0	0%
Total	19	100%	16	100%	16	100%



Personal Qualities in Pharmacy Profession



Personal Qualities in Pharmacy Profession - WHO



- 
- ★ Care-giver
 - ★ Decision-maker
 - ★ Communicator
 - ★ Manager
 - ★ Life-long learner
 - ★ Teacher
 - ★ Leader
 - ★ Researcher

PHARMACIST

P Punctuality
H Humanity
A Acceptability
R Reliability
M Morality
A Ability
C Cordiality
I Integrity
S Sincerity
T Tolerance



Proud to be a Pharmacist

