

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

السَّلَامُ عَلَيْكُمْ وَرَحْمَةُ اللَّهِ وَبَرَكَاتُهُ



كلية الصيدلة  
Faculty of Pharmacy



الجمعية العلمية لكليات  
الصيدلة في الوطن العربي



الجامعة الليبية الدولية  
LIBYAN INTERNATIONAL UNIVERSITY

The 25th Conference of the Scientific Association of Colleges of Pharmacy in the Arab World  
The 1st International Conference of the Faculty of Pharmacy at LIMU

# Doctor of Pharmacy Program (PharmD) New Horizon for Pharmacy Education & Practice

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# Lecture outlines

- Medicines (Drugs) الأدوية
- Challenges Facing Medicines Use System.
- Physicians' workload and Need for Drug Experts.
- Drug Experts?
- Evolution of Pharmacists Role in Health-care System.
- Bachelor's degrees in pharmacy to PharmD.
- PharmD Curriculum.
- Problems Facing Pharmacists Role in Health Care System.
- New Horizon for Pharmacy Education & Practice.
- Pharmacist is a major supporter of community health.



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- Medicines (Drugs) الأدوية





# Medicines

- Providing a **healthy and respectable life** for every citizen is the hope of every country.
- Medicines are essential and critical part of health-care services in all cultures and societies.
- Medicines are often an essential component of many disease prevention programs and virtually all disease treatment plans.



- **Challenges Facing Medicines Use System**



# Challenges Facing Medicines Use System

## Increase in Pharmacy Spending

- Medicines are increasingly **expensive**, and their cost is compromising the affordability of health care.
- Managing the costs of medicines is critical to making the best use of limited resources to maximize health care for as many people as possible.



# Challenges Facing Medicines Use System



## The High Cost of Adverse drug effects:

- Adverse drug reactions (**ADRs**) are one of the leading causes of hospital admissions and morbidity in developed countries and represent a substantial burden on healthcare delivery systems.
- ADRs are reported to be the **fourth or sixth** leading cause of death.
- In addition to human health, ADRs also have a significant impact on healthcare costs.

Fatal adverse drug reactions: A worldwide perspective in the World Health Organization pharmacovigilance database

Jean-Louis Montastruc *et al.* published: 10 April 2021 <https://doi.org/10.1111/bcp.14851>Citations:



# Challenges Facing Medicines Use System

## Cost of Drug Misuse

**Ten years  
wrong side / wrong site  
surgery = One day's adverse  
drug events**



# Challenges Facing Medicines Use System

Rapidly increasing number of available medications

## Drug Statistics

Total Number of Small Molecule Drugs	13154
Total Number of Biotech Drugs	4249
Total Number of Approved Drugs	4467
Total Number of Approved Small Molecule Drugs	2797
Total Number of Nutraceutical Drugs	135
Total Number of Experimental Drugs	6726
Total Number of Illicit Drugs	205
Total Number of Withdrawn Drugs	333
Total Number of Drugs	17403



# Challenges Facing Medicines Use System



## The Complex Medication-Use System (Polypharmacy)

- Patients are taking multiple, complex medicines:
- An estimated **44% of men and 57% of women older than age 65** take five or more medications.
- **Polypharmacy** was shown to increase the risk of adverse drug events from **13%**, with patients taking **two** medications, to **58%**, associated with **five** drugs.
- When patients are taking **seven or more** medications, the risk of ADEs surpasses **80%**.

# Challenges Facing Medicines Use System

## Improper Medication Use

- Over or under use, wrong time.
- Taking the wrong medicine.
- Not finishing medication.
- Administration errors.
- Using another person's medication.
- Using old, possibly expired medication.



# Challenges Facing Medicines Use System

## Patient Noncompliance

- increased morbidity (sickness).
- treatment failures.
- exacerbation of disease.
- more frequent physician visits.
- increased hospitalizations.
- Death.



# Challenges Facing Medicines Use System



The costs of medication noncompliance  
(Nonadherence)

- Studies have revealed that the cost of medication noncompliance in the US healthcare system is “**between \$100-\$289 billion every year in direct costs**”, when patients don't take their medications correctly.
- In addition, “**Losses in productivity due to health-related factors could multiply that by 2.3 times.**”



# Challenges Facing Medicines Use System

Societal Changes Suggesting Need for Improved Pharmaceutical Outcomes

- **Demographic Trends**
  - Elderly growing segment of population.
- **Cultural Trends**
  - Increased self-care; increased self-regulation.
- **Epidemiological Trends**
  - Disease shift from **acute** (curing) to **chronic** (manage, monitor, care).
- **Technology**
  - Computers, robotics provide pharmacists tools to collect and act on patient-specific and population-based information.



- **Physicians' workload and Need for Drug Experts.**



# Physicians' workload and Need for Drug Experts

- Many studies and surveys have revealed that **heavy physician workload** may compromise the **quality of medication use** and associated with **higher risk** of prescribing **inappropriately**.
- Patients are engaged in risk assessment with **each dose** due to problems of **medicine selection, dosages, improper administration** of medicines and **lack of adherence** by patients to prescribed treatment.
- Possible medicine–medicine and medicine–food interactions, and adverse medicine events.



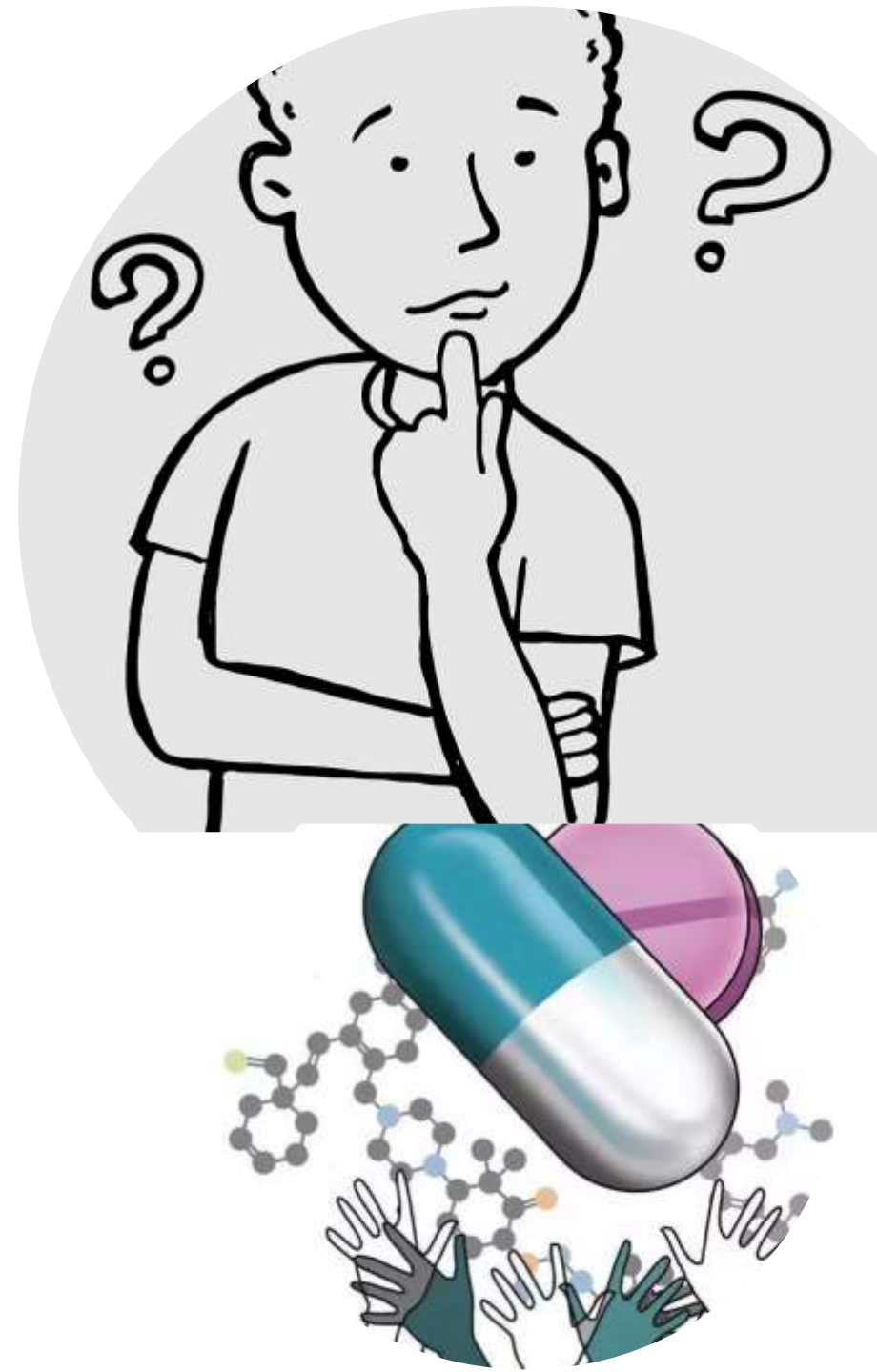
## Key Solution

- It is important **now** than ever to have **Drug Experts** in the patient care team.



# Who are the Drug Experts?

Many significant facets of medication are covered at pharmacy schools offering **Bachelor's degrees**; however, these programs **lacking** courses and experiential training that empower graduates to make decisions based on pharmacologic principles in the situation of clinical problems.



# Evolution Rx

*Pharmacy. Evolved.*

- Evolution of Pharmacists Role in Health-care System.



# Evolution of Pharmacists Role in Health-care System, How?

- The changes in the pharmacy practice **calls for and drives changes in pharmacy education.**
- Guidelines and recommendations on a **new model for pharmacy degree courses** have guided to innovation in pharmaceutical education.
- These documents define **courses in therapeutics and practice experiences** as essential components for developing the competencies necessary for clinical practice of pharmacists.
- This brings **universities and healthcare services closer together**, enhancing the potential contribution of the two institutions **to society.**



- **New Model of Pharmacy Education,  
Bachelor's degrees to PharmD.**



# New Model of Pharmacy Education Bachelor's degrees to PharmD, Why?

- The educational philosophy of pharmacy schools should be reformed in order to establish professional pharmacy programmes that assure graduates are **Drug Experts** and **health care providers**.
- Professional Program in Pharmacy leading to "**Doctor of Pharmacy Degree 'PharmD'** (دكتور صيدلة) that follows the general **accreditation standards** and **guidelines** can provide competent pharmacists as **Drug Experts** and **health care providers**.

**PharmD**

# The Doctor of Pharmacy degree, (PharmD)

- The Doctor of Pharmacy degree (دكتور صيدلة), abbreviated as PharmD, is a **professional doctor degree in Pharmacy**.
- PharmD is very much similar to professional degrees like **Doctor of Medicine (MD)** or **Doctor of Dental Surgery (DDS)** in **USA** or equal qualifications in other countries.
- Today PharmD became a **global program** available in almost all countries in the world.
- Through the PharmD programs the pharmacists are trained to become **active and integral members** of the patient care team (Pharmaceutical Care).





# PharmD Curriculum

# PharmD Curriculum



- PharmD Program is a 4 years program (+ 2 years of prerequisite courses).
- The core curriculum must include **a balance of coursework** in:
  - biomedical sciences, pharmaceutical sciences, behavioural, social and administrative sciences, and clinical sciences,
- In addition to Early and Advanced practice experience, interprofessional educational experiences and research project.
- A successful PharmD program will graduate **confident pharmacists** who are able and willing to assume responsibility and accountability for drug therapy management.
- PharmD graduates are equipped with the philosophy of **pharmaceutical care**: “to provide the patient with **safe, effective and cost-effective medications**”.



# Pharm.D. Curriculum, cont.

## 1) Basic & General Courses [but is not limited to] (**Prerequisites**)(10-12%):

- General Chemistry
- Organic Chemistry,
- Biology,
- Physics,
- statistics,
- Mathematics,
- English Language,
- Communication Skills,
- Digital Transformation.



## 2) Behavioural, social, and administrative pharmacy sciences [but is not limited to] (10-12%)

- Biostatistics
- Pharmacoeconomics
- Ethical and Professional Standards.
- Business and practice management
- Pharmacoepidemiology
- Health system

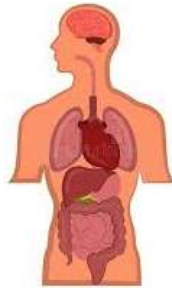


# Pharm.D. Curriculum, cont.

## 3) Biomedical Sciences Courses

[but is not limited to] =13-17% :

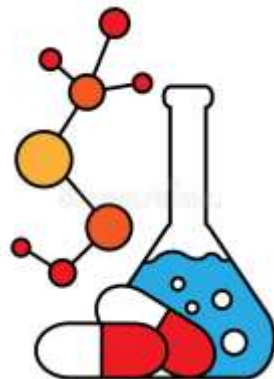
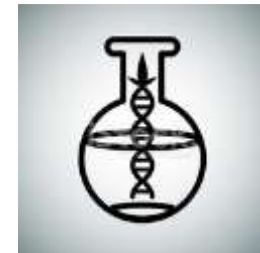
- Physiology,
- Anatomy,
- Biochemistry,
- Molecular and cell biology
- Microbiology & Immunology,
- Pathophysiology



## 4) Pharmaceutical Sciences Courses

[but is not limited to] = 28-32%:

- Physical Pharmacy
- Pharmaceutics
- Pharmacokinetics
- Biopharmaceutics
- Pharmacology
- Medicinal Chemistry,
- Biotechnology



# Pharm.D. Curriculum, cont.

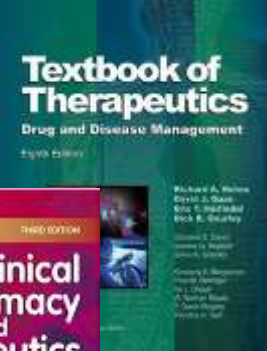
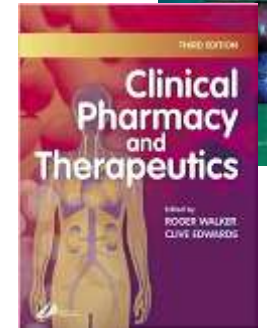
## 5) Clinical Sciences Oriented Courses [but is not limited to] = (20-22%)

- Intensive Courses in Therapeutics,
- Clinical pharmacokinetics,
- Clinical Toxicology,
- Clinical Biochemistry
- Nutrition
- Drug abuse and dependency
- Emergency first care
- Geriatrics
- Herbal Medicine



## Therapeutics (Pharmacotherapy)?

- Therapeutic courses are the most important feature of the PharmD program.
- These courses are designed to **consolidate** student skills in the selection and use of drugs commonly prescribed in medical practice.
- The courses focus on therapeutic **decision-making** in the context of clinical problems based upon pharmacologic principles.
- The courses demonstrate the **rational application of core pharmacologic principles** with general applicability to **clinical situations**.



## Pharm.D. Curriculum, cont.

### 6) Experiential Pharmacy Training:

- Experiential training is viewed as an essential requirement for the development of practical skills of graduates.
- a] **Early Pharmacy Experiential Experience (EPPE)** of pharmacy students should begin early in the educational program and should run in parallel with other components of the curriculum.
- b] **Advance Pharmacy Experiential Experience (APPE): Clinical Clerkships (Rotations = 20-15%) (Last Year of the program):**
  - 6-8 clinical rotations (4-5 Weeks each) as Ambulatory care, Hospital Pharmacy Practice, Internal Medicine, Drug Information, Community Pharmacy Practice, Infectious Diseases,...etc. (*It should be conducted under cooperative and official contracts with the training site*).
  - APPE is 1200 hrs and EPPE is 400 hrs minimum.

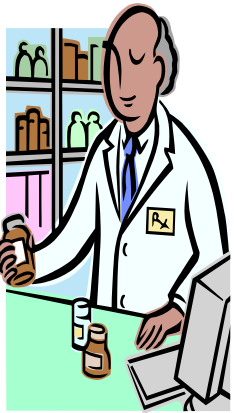
- **Problems Facing Pharmacist's Role in Health Care System**

- In most of the Arabic countries, the contribution of pharmacists in patient care system still facing logistic and financial problems.



# Problems Facing Pharmacist' Role in Health Care System

- The perception of the Pharmacist as **dispenser** of drugs still persists.
- Health care system is **physician-centered**.
- There is some **initial restraint** for a role of pharmacist in the healthcare team.
- Some health practitioners **have uncertainty** regarding the pharmacist's pharmacotherapy knowledge and abilities.
- Physicians had some concern about having their prescribing **scrutinized** by Pharmacists.





# New Horizon for Pharmacy Education & Practice

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# New Horizon for Pharmacy Education & Practice

## Pharmacy Education

- Pharmacy schools have to implement **WHO** and **FIP** guidelines for pharmacy education.
- The accreditation standards of **ACPE** or **CCAPP** are excellent resources for developing a robust PharmD program.



UNIVERSITY



World Health  
Organization



# New Horizon for Pharmacy Education & Practice

## Pharmacy Practice

- The health authorities must now put in place a **health care policy** that **maximizes the contribution of PharmD graduates** and place them at the **frontline** of the patient care system.
- Legislations must provide reliable **reimbursement** for pharmacists for their new role in the health care system.
- The **interprofessional collaboration** between **pharmacists and physicians** would assist in optimizing patients' pharmacotherapy and reduce risk factors that might arise from medication errors.





الصيدلي داعم رئيسي لصحة المجتمع

Pharmacist is a major  
supporter of community  
health

## الصيدلي داعم رئيسي لصحة المجتمع

Pharmacist is a major supporter of community health

- Pharmacists can work **independently** or in **collaboration** with physicians and other healthcare providers for the benefit of **patient care**.
- The pharmacists position themselves as a **final checkpoint** before the medications are handed over to patients.
- The pharmacy is narrated as society's last line of defense **against** medication errors.
- The pharmacists, therefore, consider their profession unique in the sense that there is **zero tolerance** for making mistakes.
- Most importantly, the pharmacists position themselves as **filling gaps** in the communication between the **patient** and the **GP**.





# الصيدلي داعم رئيسي لصحة المجتمع

Pharmacist is a major supporter of community health

- **Community Pharmacy** are **easily accessible** without previous appointments.
- **Community pharmacies** are situated in high street locations, in neighbourhood centres, in supermarkets and in the heart of the most deprived communities.
- Many are **open long hours** when other health care professionals are unavailable.
- **Community pharmacies** are providing a **convenient** and **less formal** environment for those who cannot easily access or do not choose to access other kinds of health service.
- Most pharmacies now have a **private consultation** area specifically for confidential or sensitive discussions.



*"It is not the strongest species  
that survive, nor the most  
intelligent, but the ones most  
responsive to change"*

**Charles Darwin**

*To The Faculty of  
Pharmacy at LIMU*



Thank  
you