

دولة ليبيا



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مفردات منهج برنامج الزمالة الليبية في الصيدلة السريرية

State of Libya

Libyan Board of Medical Specialties

Clinical Pharmacy Specialty Scientific Board

Clinical Pharmacy Libyan Residency Program Syllabus

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مقدمة

برنامج الزمالة الليبية في الصيدلة السريرية هو أحد برامج الزمالة في التخصصات الطبية المختلفة التي ينظمها مجلس التخصصات الطبية، والتي تهدف إلى تدريب وتأهيل اختصاصيين في المجالات الطبية بكفاءة مهنية وعلمية عالية وفق المعايير العالمية.

يوفر البرنامج بيئةً تعليميةً وتدريبيةً للصيدالة لتطوير معارفهم ومهاراتهم لممارسة الرعاية الصيدلانية السريرية الجيدة، وتعزيز كفاءتهم وتأهيلهم مهنيًا للحصول على شهادة أخصائي ممارس صيدلي سريري في التخصصات المختلفة، الأمر الذي يمكنهم من تحسين خدمات الرعاية الصحية بالمشاركة مع ذوي المهن الطبية، من خلال تقديم العلاج الدوائي الأمثل الذي يضمن سلامة المرضى ويؤدي إلى نتائج سريرية أفضل ويعمل على خفض معدلات المراضة والوفيات وتكاليف الموارد الصحية. ويتيح البرنامج الفرصة للمتدربين لتزويدهم بالمعلومات والأدوات اللازمة للقيام بالبحث العلمي في مجال التخصص، كما يتحصل الصيدالة المتدربون على العلوم والمفاهيم والإمكانيات اللازمة للعمل في مجال التعليم الطبي الجامعي.

يتضمن البرنامج تقديم المعارف المتعمقة بالصيدلة العلاجية المثلى التي تتكامل مع الفهم الأساسي للعلوم الطبية الحيوية والصيدلانية والسريرية والاجتماعية والسلوكية، والتي تتوافق مع قانون وأخلاق المهنة وفاعلية وسلامة واقتصاديات الدواء، بالإضافة إلى تزويد المتدربين بمهارات الاتصال والتواصل والبحث والتعليم والتعلم والإدارة والقرارات القائمة على الأدلة والحوكمة الجيدة والقيادة الرشيدة.

طبقاً للوائح المنظمة لبرامج مجلس التخصصات الطبية، فإن مدة البرنامج التي تتألف من أربع سنوات تشتمل على محاضرات وحلقات نقاش وتدريب تفاعلي وممارسة عملية وعرض حالات، بالإضافة إلى عمل تدريبي سريري بالأقسام السريرية بالمستشفيات التعليمية المعتمدة، بالتعاون مع الصيدالة السريريين والأطباء وغيرهم من مقدمي الرعاية الصحية بالأقسام المختلفة. كما يتضمن البرنامج القيام ببحث علمي سريري في مجال التخصص وعرض نتائجه. الأمر الذي يمكن خريجي برنامج الزمالة في الصيدلة السريرية من القيام بعملهم المهني والبحثي والتعليمي بكفاءة عالية .

وبمقارنة مساقات هذا البرنامج بعينات من برامج مماثلة بالولايات المتحدة الأمريكية وكندا والمملكة المتحدة وأستراليا والمملكة العربية السعودية والإمارات العربية المتحدة يتبين أن خريجي هذا البرنامج، إذا ما تم تطبيقه بالشكل الأمثل، سينتقلون على معارف وعلوم أشمل وسيتمتعون بإمكانيات ومهارات أوسع، لتمييزهم بقدرات وكفاءات أكبر تمنحهم الفرصة للتقدم للقيام بعملهم كصيادلة أخصائيين في الصيدلة السريرية بمرفق تقديم الرعاية الصحية وباحثين بمراكز البحوث العلمية وأعضاء هيئة تدريس بمؤسسات التعليم الطبي.

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MISSION, VISION, VALUES, AND GOALS

Mission

The Libyan Board of Clinical Pharmacy Program provides pharmacists with the knowledge and skills that will enhance their competency as health care professionals. This program prepares pharmacists to become highly qualified for practicing clinical pharmacy.

The program creates an environment that promotes excellence in pharmaceutical education, training, and research. It is designed to prepare pharmacists to become competent, reliable health care professionals. This program also strives to improve the clinical pharmacy profession and health services in Libya.

Vision

To qualify specialized clinical pharmacists and to improve health care services.

Values

- **Diversity:** To serve the community by embracing pharmacists and other health care providers who have various sets of values and different points of view.
- **Equity:** To continuously provide educational opportunities on an equitable basis to all pharmacists with different educational backgrounds.
- **Integrity:** To deal ethically and responsibly and to strive to cultivate such behaviors in clinical pharmacists as health care providers.
- **Commitment:** To support and advance the community through evidence-based practices in education, research, and clinical settings.
- **Impact:** To achieve the greatest contribution through collaborative education, research, and clinical practice with all members of other health care professions and the community.
- **Excellence:** To cultivate the quality in education, research, and service at all levels.
- **Creativity:** To improve pharmacotherapy outcomes through person-centered care and public health services.

Goals

- In-depth knowledge of the pathophysiological underpinning of diseases.
- Competence to recognize the principles of safe, effective, and economic use of medicines in health care systems.
- Advanced skills in designing pharmaceutical care plans.
- Life-long learning skills, critical thinking, problem-solving abilities, and teaching capabilities.
- The ability to conduct applied research in health sciences.

PROGRAM LEARNING OUTCOMES

1. Knowledge

1. Discuss practices in health care leadership and management.
2. Recognize the principles of dealing with patients and healthy individuals' records.
3. Discuss the pathophysiological underpinning of diseases and approaches to developing an individual-centered pharmacotherapeutic plan.
4. Discuss the pharmacotherapeutics of various diseases.
5. Recognize the principles of safe, effective, and economic use of medicines in health care systems.
6. Knowledge use towards clinical decision-making, health care organization, and health policy.

2. Skills

1. Critique the literature and drug information from available resources.
2. Design pharmacological, non-pharmacological, and patient-specific pharmaceutical care plans.
3. Employ evidence-based practice in clinical decision-making.
4. Utilize appropriate communication, presentation, and teaching skills.
5. Implement research work in clinical pharmacy practice.

3. Competence

1. Demonstrate leadership skills and innovative practice. That includes cognitive, managerial, and interpersonal activities in the medicine use process.
2. Propose new and/or updated professional clinical pharmacy practice services.
3. Collaborate effectively with peers, research collaborators, and other health care team members.
4. Maintain ethical and professional conduct in learning, research, and practice self-development.
5. Demonstrate skills for independent and life-long learning for continuous professional development.

PROGRAM PLAN

Post Graduate Year One (PGY1)

Consists of four modules, namely; LBCP 611, LBCP 612, LBCP 613, and LBCP 614. These modules set the basis for the clinical knowledge, skills, and competencies that are acquired by the pharmacist to be a caregiver, decision-maker, communicator, leader, manager, entrepreneur, life-long learner, teacher, researcher, and agent of positive change.

Post Graduate Year Two (PGY2)

Starts after fulfilling the requirements of PGY1. This year is made up of advanced pharmacy practice experiences associated with two modules of pharmacotherapy, namely; LBCP 711 and LBCP 712. The modules include didactic learning as an introduction to the internal medicine specialty, in parallel with continuous in-ward clinical rotations.

Post Graduate Year Three (PGY3)

Starts after fulfilling the requirements of PGY2. This year includes four modules. These are LBCP 811, LBCP 812, and LBCP 813 in the specialties of neurologic and psychiatric disorders; oncology, and hematology, in addition to pediatrics. The modules include didactic learning in parallel with continuous in-ward clinical rotations. Research methodology and biostatistics represent the fourth module (LBCP 814) at this stage. By the end of this year, pharmacists should present a proposal and design on a selected point of clinical research (LBCP 815).

Post Graduate Year Four (PGY4)

By the end of PGY4, the pharmacist should have completed the selected specialty rotations and the module of teaching methodology (LBCP 911). The thesis of the research project (LBCP 912) is to be evaluated and approved by the scientific committee. The pharmacist will then be qualified as a professional clinical pharmacy specialist.

LBCP means Libyan Board of Clinical Pharmacy

**POST GRADUATE YEAR ONE
(PGY1)**

**SOCIAL AND BEHAVIORAL ASPECTS IN
PHARMACEUTICAL CARE
AND
HEALTH OUTCOMES RESEARCH**

LBCP 611
(4 credit hours)

Objectives

- Identifying the social and behavioral aspects of practicing health professions, concepts of health and disease, patients' behavior towards diseases, disease prevention, and health promotion.
- Learning about clinical governance and its pillars, health care system, pharmacovigilance, and the use of health standards to provide high-quality services.
- Identifying the basic tasks of Good Pharmacy Practice and its components.
- Addressing the ethics of practicing the profession, the ethics of scientific research, and performing the pharmacist's duties ethically and professionally.
- Learning about the sciences related to outcome research such as, pharmacoepidemiology, pharmacogenomics, and their role in improving health professions' practices.
- Studying the results of the structure and operations of the health care system on the health and well-being of the patients and the population.
- Learning about new concepts in the practice of clinical pharmacy for providing safe, effective, and economical medications for patients and their application in clinical research settings and practice.

Outcomes

By the end of this module, pharmacists will be able to acquire a foundation of knowledge and skills related to the behavioral and ethical aspects of high-quality professional practice. They will be oriented on their role in health protection, disease prevention, and health promotion. The pharmacist also learns how to provide high-quality services by learning clinical governance. Pharmacists will also acquire knowledge related to modern sciences such as pharmacovigilance and pharmacoepidemiology, as well as the applications of the use of pharmacoconomics related to pharmacogenomics and the application of skills and research capabilities to provide safe, effective, economical medicines and services to patients.

Contents

I. Social and behavioral aspects of individual-centered pharmacy practice 10 hrs.

- 1. Public health and health promotion 4 hrs.**
 - 1.1 Concepts of wellness, illness, sickness, disease, health, public health, primary health care, health protection, disease prevention, health education and health promotion
 - 1.2 Determinants of health and measuring health
 - 1.3 Self-awareness and self-empowerment
 - 1.4 Behavior in health and sickness, and human behavior change
 - 1.5 Pharmacist's role in health promotion
- 2. Choosing a therapeutic agent 4 hrs.**
 - 2.1. Determinants of prescribing behavior
 - 2.1.1. Prescribing decisions
 - 2.1.2. Methods used to influence prescribing
 - 2.1.3. Pharmacists' consultation with prescribers
 - 2.1.4. Designing programs to improve prescribing
 - 2.2. Pharmacists' performance in drug product selection and therapeutic interchange
 - 2.3. Interprofessional relations in drug therapy decisions
- 3. Medication-taking behavior 2 hrs.**
 - 3.1. Predicting and detecting non-compliance
 - 3.2. Achieving concordance

II. Health care systems and clinical governance 12 hrs.

- 1. Health care systems 4 hrs.**
 - 1.1. The Health for All concept
 - 1.2. Health indicators
 - 1.3. The Libyan health care system
 - 1.4. National drug policy
 - 1.5. Levels of health care
 - 1.6. Health care structure, function, and process
 - 1.7. Health care services
 - 1.8. Health care leadership and management
- 2. Health and clinical governance 4 hrs.**
 - 2.1. Professional Governance: The use of standards for delivering quality services
 - 2.2. Pillars of Clinical Governance

- Clinical effectiveness and research
- Audit
- Risk management
- Education and training
- Patient and public involvement
- Information and information technology
- Staff management

3. Pharmacovigilance

2 hrs.

3.1. Definitions, aims, and objectives

3.2. Adverse drug reactions occurrence, monitoring and WHO definitions for causality assessment, importance of pharmacy pharmacovigilance service in patient care and clinical research

3.3. WHO program for international drug monitoring

3.4. Pharmacovigilance methods

3.4.1. Individual case safety reports

3.4.2. Clinical review of case reports

3.4.3. Cohort event monitoring

3.4.4. Longitudinal electronic patient records

3.4.5. Spontaneous reporting

3.4.6. Periodic safety update reports

3.4.7. Expedited report

3.4.8. Record linkage

4. Good pharmacy practice (GPP)

2 hrs.

The underlying philosophy and mission of GPP and its components

III. Law and ethics

6 hrs.

1. Jurisprudence: Definition, pharmaceutical legislation (national vs. international)

2 hrs.

1.1. The hierarchy of laws

1.2. Legal concepts

1.2.1. Health and pharmacy laws

1.2.2. Constitution

1.2.3. Statutory degree laws

1.2.4. Acts, codes and regulations

1.2.5. By-laws

1.2.6. Pharmacist rights, obligations, responsibility, and accountability

1.2.7. Criminal, civil, and administrative laws in pharmacy practice

This includes exposure to real cases and examples presented by a law specialist

2. Medico-legal policy and principles

1 hrs.

- 2.1. Tort law
 - 2.1.1. The types of torts
 - 2.1.2. Intentional torts
 - 2.1.3. Negligence
- 2.2. Elements of a tort claim
 - 2.2.1. Duty
 - 2.2.2. Breach of duty
 - 2.2.3. Causation
 - 2.2.4. Harm (injury)

Medico-legal cases are presented in this part for group discussions

- 3. Ethics concerns in clinical pharmacy practice and drug research **3 hrs.**
 - 3.1. Professional values in pharmacy practice
 - 3.2. Principles of ethics, values, and morals
 - 3.3. Principles of autonomy
 - 3.4. Professional ethics about patients, pharmacists, other health care professionals, industry, and the public
 - 3.5. Conflict of interest
 - 3.6. Humans in clinical trials and research
 - 3.7. Ethical considerations in pharmacy communication
 - Ethical decision-making framework
 - i. Scenarios commonly encountered in practice that require ethical decision-making
 - ii. Ethics-related cases for group discussion
 - iii. Ethics in information handling
 - iv. Team-based case discussion

IV. Health outcomes research **12 hrs.**

- 1. Role in improving health professions' practices **2 hrs.**
- 2. Studies on the results of the structure and processes of the health care system on the health and well-being of patients and populations, including:

i. Pharmacoepidemiology **4 hrs.**

- 1. Definitions, aims, and objectives
- 2. Pharmacoepidemiology versus clinical pharmacology and epidemiology
- 3. Study designs available for pharmacoepidemiology
 - 3.1. Case report
 - 3.2. Case series
 - 3.3. Analysis of secular trends (ecological studies)
 - 3.4. Case-control studies
 - 3.5. Cohort studies
 - 3.6. Randomized clinical trials

ii. Pharmacogenetics and pharmacogenomics

4 hrs.

1. Definitions
2. Genetic polymorphism
3. Gene expression
4. Genetic variability
5. Pharmacogenomics technologies

V. Critical appraisal of clinical research and evidence-based practice

2 hrs.

1. Essentials of experimental research
2. Skills involved in research design

VI. Presentation skills

2 hrs.

1. Presentation components
2. The informative and effective presentation
3. The interactive presentation
4. Verbal and non-verbal communication
5. Audiovisual aids

**HOSPITAL PHARMACY
AND
PATIENT CARE SERVICES**

LBCP 612
(5 credit hours)

Objectives

- Providing pharmacists with a foundation of knowledge, skills, and competencies needed in the provision of hospital drug distribution services and systems, record keeping, and drug chain management.
- Training pharmacists in sterile medication preparation, fluid, and electrolytes requirements, total parenteral nutrition (TPN), and all related calculations.
- Providing an individual-centered professional practice and understanding the pharmacist's role and responsibilities in rationalizing the use of medicines, with a focus on "Pharmaceutical Care" and "Medication Therapy Management" (MTM) for patients of different categories, as a model for clinical pharmacy practice.
- Learning how to calculate doses for narrow therapeutic window drugs and monitor the kinetics of these medicines clinically.
- Exposing to the preparation and administration of radiopharmaceuticals to patients for diagnostic and therapeutic purposes.

Outcomes

By the end of this module, pharmacists will be able to acquire a foundation of knowledge and skills related to hospitals' policies and procedures related to drug management, distribution systems, record keeping, and hospital drug chain management. They will have higher skills in preparing sterile medications, fluids, electrolytes requirements, related calculations, and therapeutic nutrition.

Pharmacists will be able to acquire the necessary communication, clinical, and documentation skills, in addition to the competencies in conducting and documenting medication reconciliation during the transition of care. They will be trained in extracting and disseminating evidence-based drug information.

Contents

I. Hospital pharmacy administration and services	16 hrs.
1. The administrative structure of the hospital pharmacy and responsibilities	4 hrs.
1.1. Director of the Department of Pharmacy and the Assistant Director (roles and responsibilities)	
1.2. Staff pharmacists	
1.3. Clinical pharmacists	
1.4. Hospital pharmacy residents	
1.5. Technicians and other support personnel	
1.6. Secretarial support staff	
1.7. Pharmacy and Therapeutics Committee (PTC)	
2. Hospital policies and procedures related to	4 hrs.
2.1. Medicines management, drug distribution systems, and dispensing	
2.2. Record-keeping systems including	
2.2.1. Patient medication records (PMR)	
2.2.2. Electronic medical records (EMR)	
<i>Software and procedures related to these services represent a part of the training tools</i>	
3. Managing drug selection and the essential medicines concept	4 hrs.
3.1. Approaches to essential medicines, formularies, and the role of PTC	
3.2. Rational drug use	
3.3. Treatment guidelines	
3.3.1. Establishing treatment guidelines for common diseases and infections	
3.3.2. Antimicrobial stewardship	
4. Drug information service	4 hrs.
4.1. Drug information resources and structure of the professional literature	
4.2. Drug use review	
4.3. Investigational drug activity	
4.4. Poison information	
II. In-hospital pharmacy services	34 hrs.
1. Intravenous (IV) admixtures	4 hrs.
1.1. Familiarity with needles, syringes, administration sets, and aseptic techniques	
1.2. Knowledge of milliequivalent calculations, electrolyte balances and related needs	
1.3. Drug stability, sterility, and incompatibilities	
2. Pharmaceutical compounding sterile preparation	4 hrs.
3. Total parenteral nutrition (TPN)	4 hrs.

- 3.1. Interprofessional nutrition support team
- 3.2. Indication for nutrition support
- 3.3. Nutritional requirement
- 3.4. IV access and delivery of parenteral nutrition
 - 3.4.1. Solution preparation
 - 3.4.2. TPN administration

4. Cytotoxic drugs handling **8 hrs.**

- 4.1. During drug preparation
 - 4.1.1. Policies and procedures
 - 4.1.2. Orientation of personnel involved
 - 4.1.3. Documentation of staff performance
 - 4.1.4. Drug information
 - 4.1.5. Aseptic techniques, sterile environment maintenance, and contamination prevention
 - 4.1.6. Guidelines for pharmaceutical compounding of sterile preparations
 - 4.1.7. Preparation and handling of non-injectable dosage forms
 - 4.1.8. Accidental contact with hazardous drugs
 - 4.1.9. Labeling
 - 4.1.10. Storage and distribution
- 4.2. During storage and distribution (policy and procedure)
- 4.3. During administration (policy and procedure)

5. Therapeutic drug monitoring (TDM) and pharmacokinetic dosing **10 hrs.**

Dose adjustment and drug monitoring

- Antibacterial aminoglycosides: amikacin, gentamycin and vancomycin
- Digoxin
- Antiepileptics: phenytoin, phenobarbital, carbamazepine and valproate
- Lithium
- Methotrexate
- Cyclosporines

Software and procedures related to these services represent a part of the training tools

6. Nuclear pharmacy **4 hrs.**

Preparation and patient administration of radiopharmaceuticals used for diagnosis and treatment purposes

III. Pharmaceutical care and medications management services **20 hrs.**

- The individual-centered approach: medication therapy management (MTM)
- Patient counseling, education, and communication skills

1. MTM core elements **8 hrs.**

- 1.1. Medication therapy review (MTR)
- 1.2. Personal medication record (PMR)
- 1.3. Medication-related action plan (MAP)
- 1.4. Intervention and referral

1.5. Documentation, follow-up, and interaction with other health care providers

1.6. Skills required in delivering care

- Monitoring
- Laboratory testing
- Communication skills, counseling, and concordance
- Documenting care

2. Managing medication therapy in special populations

8 hrs.

2.1. Patients with polypharmacy

2.2. Pediatric patients

2.3. Geriatric patients

2.4. Pregnancy and lactation

2.5. Immunodeficient, renal, and hepatic impairment patients

3. Medication reconciliation and transition of care

4 hrs.

Real-life situations are followed, and case presentations are given using the patient-care process

**HEALTH ADMINISTRATION
AND
PHARMACOECONOMICS**

LBCP 613
(2 credit hours)

Objectives

- Developing specialized professional health administrative thinking to deal with health sector issues and problems related to effectiveness, efficiency, justice, quality, and reasonable prices.
- Solving problems facing the health sector administration and economy, and seeking to develop this sector through developing managerial skills and capabilities and building leadership capabilities of pharmacists in health care institutions.
- Providing pharmacists with the necessary skills that enable them to take preventive measures against risks and expected sources of harm before they occur.
- Having a chance to learn how to allocate resources and to study pharmacoeconomic evaluation methods to provide pharmaceutical care services and optimal treatments at the lowest possible cost.
- Supporting health care facilities with knowledgeable pharmacists who possess the intellectual and technical skills necessary to manage and operate effectively, efficiently, and with the highest levels of professionalism.

Outcomes

Obtaining the foundations of knowledge and skills related to health administration and the economic aspect will enable pharmacists to practice a high-quality profession. Understanding the health system, knowledge of rights and duties, job descriptions, and position in the organizational structure of the institutions as a clinical pharmacist.

Acquiring knowledge related to health data management and health information management systems, and getting exposed to the research related to this field. Learning the pharmacoeconomics principles and their application to pharmaceutical care, by estimating the value of pharmaceutical products and services and comparing costs and consequences to select what is best for the patient and/or health care institution.

Contents

I. Health administration	8 hrs.
1. Basis of health administration	4 hrs.
1.1. Fundamentals of health care administration	
1.2. Principles of management	
1.3. Hospital operation	
2. Health information management	4 hrs.
2.1. Health information technology and IT users	
2.2. Patient records and electronic health records	
2.3. Data collection and storage	
2.4. Ethical considerations	
II. Pharmacoeconomics (PE)	16 hrs.
1. Health care economics, pharmacoeconomics, and health-related quality of life	2 hrs.
2. Types of pharmacoeconomic studies	2 hrs.
2.1. Cost-minimization analysis	
2.2. Cost-effectiveness analysis	
2.3. Cost-utility analysis	
2.4. Cost-benefit analysis	
2.5. Other types of analyses	
2.5.1. Cost-consequence analysis	
2.5.2. Cost of illness	
3. Cost categorization	4 hrs.
3.1. Direct medical costs	
3.2. Direct non-medical costs	
3.3. Indirect costs	
3.4. Intangible costs	
3.5. Opportunity costs	
3.6. Incremental costs	
4. Perspectives to be considered in PE evaluation	1 hrs.
5. Timing adjustments for costs	2 hrs.
5.1. Bringing past and future costs to the present	
5.2. Average versus marginal or incremental costs	

- 6. Resources for cost estimations **2 hrs.**
 - 6.1. Medications
 - 6.2. Medical services
 - 6.3. Personnel
 - 6.4. Hospitalizations

- 7. Decision analysis **3 hrs.**
 - 7.1. Definition
 - 7.2. Steps in decision analysis
 - 7.3. Threshold analysis

CLINICAL SKILLS FOR PHARMACISTS

LBCP 614
(2 credit hours)

Objectives

- Training pharmacists to respond to medical emergencies and help in patient care.
- Facilitating effective communication between pharmacists and other health care professionals.
- Identifying and employing the appropriate diagnostic and physical testing techniques to inform clinical decision-making.
- Obtaining and recording relevant patient history.
- Supporting patients helping them in choosing options and providing adequate counseling regarding their treatment.

Outcomes

By the end of this module, pharmacists will acquire knowledge and understanding of history-taking components, concepts of general examination, and vital signs. They will gain practical and professional skills in basic life support, history taking, and disease management. Pharmacists will learn the processes of sterilization and hygiene during practical sessions. Self and peer evaluation will be practiced.

Contents

1. Parental administration and blood extraction **2 hrs.**
 - 1.1. Subcutaneous injection
 - 1.2. Intramuscular injection
 - 1.3. Intravenous injection
 - 1.4. Venous blood extraction
 - 1.5. Arterial blood extraction
 - 1.6. Obtaining intravenous access

2. General history taking **2 hrs.**
 - 2.1. Principles of history taking
 - 2.2. Structure of clinical history
 - 2.3. Past medical history
 - 2.4. Drug history
 - 2.5. Presenting the patient's history

3. General examination **3 hrs.**
 - 3.1. Vital signs
 - 3.2. Examinations of face and hands
 - 3.3. Examination of thyroid and cervical lymph node
 - 3.4. Examination of lower limbs
 - 3.5. Ethics of clinical examination

4. Cardiovascular system **3 hrs.**
 - 4.1. Cardiovascular history
 - 4.2. Examination of the pericardium
 - 4.3. Examination of peripheral pulses

5. Respiratory system **3 hrs.**
 - 5.1. Respiratory history
 - 5.2. Examination of the front of the chest
 - 5.3. Examination of the back of the chest

6. Gastrointestinal tract **2 hrs.**
 - 6.1. Gastrointestinal history
 - 6.2. Abdominal examination
 - 6.3. Rectal examination
 - 6.4. Palpation for deep organs

7. Renal system **2 hrs.**
 - 7.1. Urological history
 - 7.2. Examination of the kidneys
 - 7.3. Examination of the renal angle
 - 7.4. Examination of the scrotum

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| 8. Gynecology | <i>1 hr.</i> |
| 8.1. Gynecological history | |
| 8.2. Speculum examination | |
| 8.3. Bimanual examination | |
| 9. Obstetrics | <i>1 hr.</i> |
| 7.4. Obstetric history | |
| 7.5. Obstetric examination | |
| 10. Central nervous system | <i>4 hrs.</i> |
| 10.1. System history and examination | |
| 10.2. Cranial nerve examination | |
| 10.3. Motor examination | |
| 10.4. Proprioception | |
| 11. Wound healing, ulcers, and diabetic foot | <i>3 hrs.</i> |
| 11.1. Principles of wound healing | |
| 11.2. Wound dressing | |
| 11.3. Types of ulcers | |
| 11.4. Examination of diabetic foot | |
| 12. Basic life support | <i>2 hrs.</i> |

**POST GRADUATE YEAR TWO
(PGY2)**

Objectives

- Providing pharmacists with the skills to integrate knowledge and concepts to contribute positively to hospitalized patients.
- Training and practicing to acquire clinical skills, combined with problem-based learning skills. That is to solve drug-related problems and to achieve specific outcomes towards improving patients' quality of life.
- Focusing on the most common diseases in the field of internal medicine by examining the pathophysiology of these diseases and their pharmacotherapy (including dosing, side effects, drug interactions related to pharmacokinetics, alternative therapy, and pharmacovigilance).
- Applying evidence-based medicine to the conditions and diseases being studied. That is to provide pharmacists with the knowledge and skills to determine the benefits and limitations of modern evidence-based suggestions and guidelines in the current practice.

Outcomes

By the end of this year, pharmacists will apply their knowledge of the pathophysiology and management of diseases to patients' conditions within the hospital setting. They will identify drug therapy problems, prioritize them, develop the appropriate treatment plan for each patient, the requirements for follow-up, and evaluation of the response to the specific treatment. Pharmacists will be able to document interventions effectively.

These clinical training modules enable interaction with physicians and other health professionals working in the various units of internal medicine, pediatrics, oncology, and other departments, as well as enriching them with relevant drug treatment information.

The above objectives and outcomes apply to the clinical modules of the postgraduate year three (PGY3).

PHARMACOTHERAPY I

LBCP 711

(18 credit hours)

(1 week = 1 credit hour)

<i>Topic</i>	<i>Didactic</i>	<i>Experiential</i>
1. Cardiovascular diseases	1 week	5 weeks
1.1. Hypertension		4 cases discussion
1.2. Ischemic heart disease		1 case presentation
1.3. Heart failure		
1.4. Cardiac arrhythmia		
1.5. Dyslipidemia and arteriosclerosis		
1.6. Thrombosis		
1.6.1. Deep vein thrombosis		
1.6.2. Peripheral vascular disease		
1.6.3. Pulmonary embolism		
1.6.4. Chronic anticoagulation		
1.7. Stroke		
2. Endocrine disorders	1 week	4 weeks
2.1. Diabetes mellitus		3 cases discussion
2.2. Thyroid glands disorders		1 case presentation
2.3. Adrenal gland disorders		
2.4. Polycystic ovary		
3. Pulmonary diseases	1 week	3 weeks
3.1. Asthma		2 cases discussion
3.2. COPD		1 case presentation
3.3. COVID		
4. Renal diseases	1 week	2 weeks
4.1. Acute renal failure		1 cases discussion
4.2. Chronic renal failure		1 case presentation
4.3. Urinary incontinence		
4.4. Benign prostate-hypertrophy		

PHARMACOTHERAPY II

LBCP 712

(17 credit hours)

(1 week = 1 credit hour)

<i>Topic</i>	<i>Didactic</i>	<i>Experiential</i>
1. Infectious diseases	1 week	4 weeks
1.1. Principles of infectious diseases		3 cases discussion
1.2. Respiratory tract infections		1 case presentation
1.3. Urinary tract infections		
1.4. Intra-abdominal infections		
1.5. Osteomyelitis and septic arthritis		
1.6. Opportunistic infections		
2. ICU and critical care	1 week	3 weeks
2.1. Shock syndrome and sepsis		2 cases discussion
2.2. Acute respiratory distress syndrome		1 case presentation
2.3. Acute cardiac care		
2.4. Neurocritical care		
3. Bone and rheumatic diseases	1 week	3 weeks
3.1. Rheumatic arthritis		2 cases discussion
3.2. Tendonitis		1 case presentation
3.3. Gout and hyperuricemia		
3.4. Osteoporosis		
3.5. Carpel tunnel syndrome		
4. Gastrointestinal diseases	1 week	4 weeks
4.1. Gastroesophageal reflux		3 cases discussion
4.2. Peptic ulcer diseases		1 case presentation
4.2.1. Duodenal ulcer		
4.2.2. Gastric ulcer		
4.2.3. Complications of PUD		
4.2.4. Upper GIT bleeding management		
4.2.5. Drug-induced PUD		
4.3. Inflammatory bowel disease		
4.3.1. Ulcerative colitis		
4.3.2. Crohn's disease		
4.4. Viral hepatitis		
4.4.1. HAV		
4.4.2. HBV		
4.4.3. HCV		
4.5. Drug-induced liver injury		
4.6. Pancreatitis		
4.7. Diarrhea, constipation and IBS		

**POST GRADUATE YEAR THREE
(PGY3)**

NEUROPSYCHIATRIC DISORDERS

LBCP 811

(6 credit hours)

(1 week = 1 credit hour)

<i>Topic</i>	<i>Didactic</i>	<i>Experiential</i>
1. Neurologic diseases	1 week	2 weeks
1.1. Introduction		1 cases discussion
1.1.1. Neuroanatomy		1 case presentation
1.1.2. Evaluation of neurological illness		
1.2. Cerebrovascular disorders		
1.2.1. Head injury		
1.3. Epilepsy		
1.4. Parkinson's disease		
1.5. Dementia and Alzheimer's disease		
2. Psychiatric disorders	1 week	2 weeks
2.1. Evaluation of psychiatric illness		1 cases discussion
2.2. Schizophrenia		1 case presentation
2.3. Depressive disorders		
2.4. Bipolar disorders		
2.5. Anxiety disorders		

ONCOLOGY AND HEMATOLOGY

LBCP 812

(8 credit hours)

(1 week = 1 credit hour)

<i>Topic</i>	<i>Didactic</i>	<i>Experiential</i>
1. Oncology	1 week	3 weeks
1.1. General principles		2 cases discussion
1.2. Hematological malignancies		1 case presentation
1.2.1. Leukemia		
1.2.2. Lymphoma		
1.3. Solid tumors		
1.4. Hematopoietic cell transplantation		
2. Hematology	1 week	3 weeks
2.1. Anemia		2 cases discussion
2.2. Bleeding disorders		1 case presentation
2.3. Blood clots		

PEDIATRICS

LBCP 813

(6 credit hours)

(1 week = 1 credit hour)

<i>Topic</i>	<i>Didactic</i>	<i>Experiential</i>
1. Pediatric cardiovascular, renal, and pulmonary diseases	1 week	5 weeks
4.1. Congenital heart disease		4 cases discussion
4.2. Glomerulonephritis		1 case presentation
4.3. Chronic kidney failure		
4.4. Chronic asthma		
4.5. Cystic fibrosis		
2. Pediatric infectious diseases		
2.1. Meningitis and sepsis (protocols of antibiotics used in their treatment)		
2.2. Otitis media		
2.3. Respiratory syncytial virus (RSV)		
3. Pediatric neuropsychiatric disorders		
3.1. Pediatric seizure disorders		
3.2. Attention deficit hyperactivity disorder (ADHD)		
3.3. Pain management		
4. Pediatric oncology and hematology		
4.1. Aplastic anemia		
4.2. Sickle cell anemia		
4.3. Thalassemia		
5. Pediatric endocrine disorders		
5.1. Diabetes mellitus		
5.2. Growth hormone deficiency		
6. Immunization		

**RESEARCH METHODOLOGY
AND
BIostatISTICS
LBCP 814
(1 credit hour)**

Objectives

- Learning how to design and plan the clinical research project.
- Knowing how to review the literature, collect and organize data, and choose the appropriate statistical analysis to answer the research questions under study.
- Acquiring the ability to interpret the findings.
- Gaining the scientific writing and publishing skills

Outcomes

This module focuses on acquiring applied knowledge related to the principles of research methodology and biostatistics, which will be reflected in the pharmacists' performance within the health institutions. This includes enabling the pharmacist to participate in various clinical researches as a planner, collector, analyzer, and interpreter of data, and selecting the appropriate statistical analysis for the data.

Contents

- **Research methodology** *4 hrs.*
 1. Research plan
 2. Literature evaluation
 3. Research methods
 4. Writing Principles
 5. Academic writing
 6. Research report
 7. Publishing process

 - **Biostatistics** *4 hrs.*
- I. Statistical analysis** *1 hr.*
- Parametric and nonparametric methods**
1. Numerical data: one group, two matched groups, two unmatched groups, and more than two groups
 2. Categorical data: one proportion, two proportions, and more than two categories.
- II. Statistical techniques to explore relationships among variables** *1 hr.*
- a) **Simple correlation**
 - b) **Linear regression**
 - c) **Logistic regression**
- III. Survival analysis** (the Kaplan-Meier table and the Kaplan-Meier chart) *1 hr.*
- IV. Statistics to analyze clinical investigations and screening** *1 hr.*
1. Diagnostic testing/screening (sensitivity and specificity)
 2. Level of agreement
- **Clinical trials as experimental designs** *4 hrs.*
- Trial design types:
1. Phase I clinical trial
 2. Phase II clinical trial
 3. Phase III clinical trial
 4. Phase IV clinical trial
 5. Other trials
 6. Research protocol

RESEARCH PLAN

LBCP 815

(4 credit hours)

- The pharmacists have to select a research point, which should be designated in the same area of specialty.
- By the end of PGY3, pharmacists have to write a research proposal and design its plan.

**POST GRADUATE YEAR FOUR
(PGY4)**

TEACHING METHODOLOGY

LBCP 911

(1 credit hour)

A continuation of PGY3 to study the teaching methodology and to carry out the research after its approval by a competent committee.

Teaching methodology

12 hrs.

1. Academic teaching approaches, methods, and skills
2. Effective communication: motivation, empowerment, active participation, and enhanced learning.
3. Learners as a source of instructional goals.
4. Teaching feedback, evaluation, and assessment.
5. Clinical teaching steps.

RESEARCH PROJECT
LBCP 912

The pharmacist has to complete the research work and submit a thesis to a committee chosen from specialists in the field.

After fulfilling all requirements, the pharmacist will be granted the stipulated degree after completing the defense and approving the thesis.