



Advanced Pharmacy Practice Experience Manual

Doctor of Pharmacy

King Khalid University
College of Pharmacy
Pharmacy Training Unit
Experiential Education Office

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Introduction

Vision

To provide a high quality of clinical pharmacy education in order to produce competent clinical pharmacists for the community.

Mission

1. To provide patient care in cooperation with other members of the health care team based on therapeutic knowledge and disease management skills.
2. To manage and use the resources of the health care system, in cooperation with prescribers and other health care providers, to improve the therapeutic outcomes of medication use.
3. To promote health improvement, patient education, compliance, and disease prevention in the community in cooperation with the health care team.
4. To participate in scientific research and develop new hypotheses in disease management for the benefit of healthcare and the community.

Code of Ethics

Code of Ethics (KKU)¹

King Khalid University (KKU) was founded on a set of values derived from the teachings of our Islamic religion, which has been the path for the country's leaders and is consistent with the Ministry of Education policies. KKU is an academic institution that is committed to providing education, research and community service at the finest level. The versatility of KKU's mission has led to the development of a framework for values and ethics that should be respected and followed by all KKU students.

¹ For more information on KKU ethics, please visit the official KKU website: http://eportal.kku.edu.sa/sites/default/files/pdf/code_of_ethics.pdf

Code of Ethics for Pharmacists (APhA)²

Pharmacists are health professionals who assist individuals in making the best use of medications. This Code, prepared and supported by pharmacists, is intended to state publicly the principles that form the fundamental basis of the roles and responsibilities of pharmacists. These principles, based on moral obligations and virtues, are established to guide pharmacists in relationships with patients, health professionals, and society.

1. A pharmacist respects the covenantal relationship between the patient and pharmacist.
2. A pharmacist promotes the good of every patient in a caring, compassionate, and confidential manner.
3. A pharmacist respects the autonomy and dignity of each patient.
4. A pharmacist acts with honesty and integrity in professional relationships.
5. A pharmacist maintains professional competence.
6. A pharmacist respects the values and abilities of colleagues and other health professionals.
7. A pharmacist serves individual, community, and societal needs.
8. A pharmacist seeks justice in the distribution of health resources.

² Adopted from the American Pharmacists Association October 27, 1994. <http://www.pharmacist.com/code-ethics>

Responsibilities

Preceptor Responsibilities

- Accept the responsibility of supervising the student's activities and monitor the achievement of required tasks consistent with course objectives by devoting adequate time for guidance.
- Exhibit those qualities which foster a positive professional role model (appearance, attitudes, practice style and accomplishments in practice).
- Provide students with the opportunity to advance their knowledge, skills, and experience in an accelerated timeframe through a structured, practice-based training program aligned with the course syllabus.
- Communicate with the students regarding their appearance, conduct, attitude, scheduling of hours, experience to be gained, and general policies and procedures of the training site.
- Never presume the student's capabilities, instead review their work profile and discuss with them their prior experience to better judge their capabilities.
- Provide students with access to available drug information resources.
- Regularly assess the student's performance through constructive evaluation and provide specific recommendations for improvement if needed.
- Complete the evaluation and grading of students on time and send it (via email) to the Experiential Education Office (EEO) at EEO.Pharmacy@kku.edu.sa on the last day of each rotation.
- Correspond with the EEO regarding any significant irregularities related to a student's activities, such as irregular attendance, unprofessional appearance, breach of training site policies, unprofessional behavior, or inappropriate communications with health professionals, patients, or staff.

Student Responsibilities

- Students should dress professionally according to the college's dress code (refer to Dress Code Section).
- Students should attend the rotations punctually as per the schedule and conduct themselves appropriately.
- Students should build good rapport with their preceptors, as this is an effective way to improve learning.
- Students are expected to be respectful in their communication with their preceptors; in the case of a difference of opinions about a particular clinical situation, they are

expected to resolve the conflicts in private in an atmosphere of mutual respect. All criticism should be viewed as a means of learning.

- All students are required to effectively use and respond to written, verbal and non-verbal communications from diverse audiences (physicians, pharmacists, other health professionals, and patients) and for varied purposes.
- Students are bound by a duty of confidentiality to the patients in regard to their conditions and records; this obligation is fundamental to the practice of pharmacy.
- Students must remain proactive during clinical rotations and continue to seek guidance and mentoring to achieve the goal of excellence.
- Students must NOT make any clinical decisions that affect patient care without verifying it with the preceptor.
- No student should perform procedures or tasks for which he or she is not legally authorized or qualified.
- Students should seek clarification on any clinical dilemmas from all the concerned persons in order to gain further understanding.
- Students must avoid discriminatory practices, behavior, or work conditions that may impair professional judgment.
- Students must NOT accept portions of someone else's work or data and present it as his or her own work. All forms of plagiarism should be avoided.
- Students should abide by the law and comply with the Code of Conduct which governs the practice of pharmacy, as well as all institutional policies, rules, and regulations.

Clinical Rotations

The Advanced Pharmacy Practice Experience (APPE) has been designed to provide students with experience in various clinical pharmacy practice areas, including hospitals, community pharmacies, and health institutions. The major goal is to prepare students to develop independent judgment skills and to integrate their fundamental knowledge with clinical applications. In the 6th year, students are required to take 1,600 hours of APPE experience during 3 semesters, a period of 40 weeks. Students must have passed all the program courses to be eligible for APPE.

Main Objectives

1. To prepare students to review, evaluate, implement, and monitor therapeutic outcomes associated with a pharmaceutical care plan for patients. In doing so, students will acquire hands on experience using their knowledge of therapeutics, disease processes, and pharmaceutical products.
2. To help students to develop a solid knowledge of medical terminology, communication skills, drug monitoring skills, provision of drug information, therapeutic planning skills, and the ability to assess and interpret physical and laboratory findings.
3. To foster and incubate student ideas for innovation that will advance professional clinical pharmacy services which will lead to improving local and global health service quality, delivery, and productivity.

General Description

The APPE experience consists of eight rotations. The four mandatory rotations include:

- Hospital or institutional rotation
- Community pharmacy rotation
- Ambulatory care rotation
- Internal medicine rotation

The other 4 rotations are elective; examples of the elective rotations include:

- Academia
- Infectious diseases
- IV preparation & total parenteral nutrition (TPN)
- Nephrology
- Oncology
- Pediatrics
- Psychiatry

- Research
- Other types of rotations

The duration of each rotation is 5 weeks (a total of 1600 hours for all 8 rotations). These are distributed throughout the sixth year as follows:

Clinical rotations begin in following semester after successfully passing all didactic courses			Rotation	Duration
Summer	Fall (1 st Semester)	Spring (2 nd Semester)	APPE I	5 weeks (200 hours)
			APPE II	5 weeks (200 hours)
Fall (1 st Semester)	Spring (2 nd Semester)	Summer	APPE III	5 weeks (200 hours)
			APPE IV	5 weeks (200 hours)
Spring (2 nd Semester)	Summer	Fall (1 st Semester)	APPE V	5 weeks (200 hours)
			APPE VI	5 weeks (200 hours)
			APPE VII	5 weeks (200 hours)
			APPE VIII	5 weeks (200 hours)
			Total	40 weeks (1600 hours)

Activities During Clinical Rotations

Students will be directed to perform various activities by their preceptors. These activities are graded and may include journal clubs, presentations, drug consults, and written assignments.

Assessment of Clinical Rotations

- Evaluation will be based on the National Commission for Assessment and Academic Accreditation (NCAAA) domains:
 - Knowledge
 - Cognitive skills
 - Interpersonal skills

- Communication and information technology skills
- Psychomotor skills
- All preceptors should use the “Rotation Evaluation Form” provided by the EEO.
- Preceptors should evaluate the student twice during the rotation: mid-rotation and end of rotation. The purpose of the mid-rotation evaluation is to detect any deficiencies in student performance and advise him/her on how to improve in order to complete the rotation successfully.
- Students will receive a final grade based on the preceptor’s evaluation for each rotation. The student should have a final score of $\geq 60\%$ to pass the rotation; otherwise, it will be considered as a failed rotation and will result in a delay in his or her graduation by at least one semester. The student will have to repeat the failed rotation until he or she receives a final grade of $\geq 60\%$.

Clinical Rotation Outcomes

By the end of the 6th year, students will be able to:

- Provide optimal patient care in collaboration with prescribers, nurses, pharmacists, and other healthcare professionals, based on therapeutic principles and evidence-based data, taking into account pertinent legal, ethical, social, and economic issues, and evolving biomedical, pharmaceutical, and clinical sciences that may impact therapeutic outcomes.
- Manage and use the resources of the health care system, in cooperation with prescribers, nurses, pharmacists, and other health care providers, to promote health, provide accurate medication consultation, and improve therapeutic outcomes of medication use.
- Promote personal health, wellbeing, and disease prevention in cooperation with patients, communities, at-risk populations, and other members of an inter-professional team of health care providers.
- Provide preventive and supportive health care services to the community.
- Develop the leadership qualities to function effectively as a member of the health care team in order to deliver health and family welfare services.
- Communicate effectively with patients and the community.

Registration and Training Site Selection

- It is the responsibility of the student to register for clinical rotations during his/her final semester of coursework in order to start the rotations the following semester.
- At the beginning of the semester, the EEO will announce the availability of registration forms, lists of the approved training sites, and the deadline for submission. It is the student responsibility to adhere to the announced deadlines.
- Students who wish to receive training outside the approved training sites should fill out Request for Letter to External Site form. They should also provide the official email address of the external site in the same form. The EEO will send official letters to the external sites by the end of the registration period. A 2-week period will be given for the external site to respond. In case of rejection or no response (for more than two week), the EEO will assign the student to one of the approved sites based on availability.
- Students are placed in the clinical rotation sites by the EEO according to their preferences, GPA, and availability of specific rotation sites.
- Once the EEO announces the individual training schedules, the students are allowed to request to change the training sites within a week (i.e. 5 business days) of the announcement. After that period, the individual training schedules are final and cannot be changed.
- After the schedule has been finalized, it is the responsibility of the students to contact their preceptors at least 2 weeks before the rotation starts.
- Students are expected to fulfill all the required procedures of the training site.

Policies

Professionalism

Students on the training site should behave professionally and follow the professional ethics without any compromise. Students must abide by the Islamic ethics, as well as the rules and regulations of the college and the training site. In the case of any violation, the preceptor should inform the EEO, and the final decision will be made by the College Board on such issues.

Dress Code

Students must exhibit a professional appearance as a pharmacy intern, both in manner and in dress. The student must adhere at all times to the standards of dress and behavior specified by the training site to which he or she is assigned. Appropriate professional appearance should include, but is not limited to, the following expectations:

- Students should wear the college uniform and a professional white coat with the university logo at all times while at the training site.
- Students should wear their identification card (i.e. pharmacy intern card) on an outer garment or hanging around the neck. It must be visible at all times.
- Students should keep their clothes clean and neatly ironed.
- Hairstyle should be professional. Students should NOT wear a hat or cap.
- Footwear should be appropriate for the setting. Canvas shoes or professional shoes are expected. Sandals, slippers, or high heel shoes are NOT allowed.
- Students must follow any additional rules regarding dress code as established by the training site.
- Students must keep in mind, at all times, that they are representatives of King Khalid University and must maintain discipline and good attitude at the training sites.

Immunizations

It is the responsibility of students to meet the immunization requirements of the training sites prior to the beginning of APPE. Failure to fulfill the requirements in advance may result in the cancelation of rotation. Therefore, it is highly recommended that students have proof of immunization ready for submission upon request at the training site. The most common required immunizations are MMR, polio, tetanus/diphtheria, pertussis, varicella, chicken pox, seasonal flu vaccine, and the hepatitis B vaccine series. Students may also need to show proof that they are free from tuberculosis, hepatitis B, and rubella. A certificate from an accredited Basic Life Support (BLS) course might also be needed.

Absence Policy

- Students must complete the required training period (200 hours for each rotation) in the allocated time.
- The daily attendance sheet, provided by the EEO, should be signed by the intern every day and submitted to the EEO, along with the evaluation form.
- Students must inform their preceptor of any absence or lateness one day before its occurrence, and the preceptor should inform the EEO if absence exceeds 3 days (or 5 days for excused absence).
- Unexcused absence:
 - If a student was absent for 3 days or less per rotation, the student has to complete the missed hours within his or her training period by performing extra hours with the coordination of the site preceptor. Failure in doing that may result in canceling the rotation.
 - If a student was absent for more than 3 days per rotation, the rotation will be canceled, and the student will have to repeat that rotation type after completing the training schedule.
- Excused absence:
 - Students who want to apply for an excused absence should inform the preceptor and apply to the EEO one week before or after the incident, with the appropriate required documents.
 - If the student was absent for 5 days or less per rotation, the student has to complete the missed hours within the training period. The preceptor may choose to assign the student to do an assignment that is worth of the work of the missed days.
 - If the student was absent for more than 5 days per rotation, the student will have to repeat that rotation type after completing his or her training schedule.

Lateness Policy

- Students should always be punctual and follow the daily schedule given by the preceptor and the training site.
- If a student is late for his or her rotation, the student has to make up for the missed hours.

- The following penalties should be applied:

Lateness Times	Penalty
1 st time	Warning letter from the preceptor
2 nd time	It will be considered as a half-day absence (the student has to make up the hours for half a day).
3 rd time	It will be considered as a one-day absence (the student has to make up the hours for 1 day).
4 th time	It will be considered as a two-day absence (the student has to make up the hours for 2 days).
5 th time	It will be considered as an unexcused absence of more than 3 days, and the rotation will be cancelled.

- In case the student did not make up the missed hours or was late for the 5th time, preceptors should inform the EEO.

Holidays

Students are obligated to follow the holiday calendar that will be provided by the EEO, along with their clinical rotation schedule. Students are NOT allowed to follow any other calendars.

Confidentiality

- Students must NOT discuss their patients with other patients, colleagues, friends, family members or anyone who is not directly related to their patients.
- Students must observe confidentiality at all times.
- Students must NOT discuss patient cases in front of other people who may overhear.
- Students must NOT include patient identifiers (name, file number, etc.) in their case presentations.
- Students must NOT breach confidentiality by leaving confidential documents in public places or taking them home.
- Students should NOT develop personal relationships with patients.

- If the training site asks students to sign a confidentiality statement, the students must do so.
- Students must follow any additional rules and regulations of the training site.

Plagiarism

Plagiarism is a form of academic dishonesty which consists presenting someone else's work as his or her own work (e.g. copying other students' or authors' work for his or her own assignments or research purposes). If any students are found to be involved in such activities, his/her research or assignments will be nullified by the preceptor or by the EEO, and the student will receive a zero grade.

Cancellation of Rotation

The EEO will cancel the rotation of any student if complaints are received regarding their professionalism or attitude. The student has to repeat the cancelled rotation after completing his/her training schedule. If the EEO receives a second complaint, the EEO will raise the student case to the College Board to discuss his or her dismissal from the program.

Failure of Rotation

If a student fails a rotation, he/she will have to repeat that rotation type after completing the training schedule. This will result in a delay in his or her graduation by at least one semester.

Required Rotations

Hospital/Institutional Rotation

The Hospital Pharmacy Rotation aims to provide students with experience in various aspects of inpatient pharmacy practice. This may include, but not limited to, the delivery of drug products to patients and other hospital departments, clinical pharmacy services, pharmacy informatics, and pharmacy management.

Goals and Objectives

At the conclusion of the Hospital Pharmacy Practice rotation, students should gain experience or at least exposure to the following activities:

1. Processing Medication Orders:

Students should have considerable exposure to processing medication orders. Exposure to processing medication orders tasks should be distributed across different areas within the pharmacy department and integrated into other activities of pharmacy services. At the conclusion of this activity, students should be able to:

- Participate in order entry and screening in patient care areas, satellite pharmacy locations and central inpatient pharmacy if applicable.
- Describe requirements for receiving written, electronic, verbal medication orders that are allowed by the institution.
- Evaluate orders for completeness, appropriate indication, appropriate dosing and route of administration, allergies, drug-drug interactions, drug-food interactions, drug-disease interactions and formulary requirements.
- Create patient profiles or modifying existing ones in addition to perform order entries and select products appropriately.

2. Medication Therapy Management (MTM):

- Interviewing patients: students should be trained on how to collect information needed for appropriate care such as allergies, medication and disease history in order to perform clinical pharmacy consults and solve any medication problems.
- Gathering and evaluating information: from paper and electronic charts, medication administration records, laboratory reports and any other applicable sources.
- Documentation: students should be trained on how to document clinical services and clinical interventions provided during the patient care according to applicable institutional procedures.

3. Pharmacy Management

1-2 days of exposure to various activities of pharmacy management such as: inventory procedures including procurement & storage, billing procedures, procurement and maintenance of pharmacy equipment, compliance with regulations, departmental and institutional meetings (e.g. staff meetings, P&T etc..) and adverse event monitoring and medication errors reporting.

4. Controlled Substances

Students should be trained on procedures for procurement, storage and inventory of controlled substances as well as procedures for distribution and tracking.

5. Preparation and Distribution of Products:

Students may work with pharmacy technician performing these tasks, including but not limited to the following:

- Unit dose: Pyxis machines and cart fill/delivery.
- Labeling & Repackaging: bulk to unit doses and bulk dispensing with appropriate recording.
- Non-sterile compounding: perform accurate compounding calculations, accurate measurements, and the use of appropriate ingredients and correct procedures to make the final product.
- Sterile compounding: Students should be trained on aseptic technique and how to maintain sterile environment. Students will also be trained on making accurate calculations and measurements and learn the fundamentals of IV compounding, compatibility and stability.
- Cytotoxic agents: If applicable, students should be trained on aseptic technique and how to maintain sterile environment as well as the use of appropriate personal protective equipment.

6. Investigational Drugs

If applicable students should become aware of the pharmacist role in investigational drug programs within the institution as well as storage, distribution and record keeping of those drugs.

Activities

- Reviewing patient charts.
- Attending morning meetings and daily rounds.
- Detailed case presentation.
- Patient counseling.
- Journal club.
- Any other activities assigned by the preceptor.

Community Pharmacy Rotation

The community pharmacy rotation aims to provide students with experience in various aspects of community pharmacy practice, which may include but not limited to, dispensing products, providing clinical pharmacy services, and pharmacy management.

Goals and Objectives

At the conclusion of the community Pharmacy Practice rotation, students should gain experience or at least exposure to the following activities:

1. Preparation and Dispensing of Prescription Products

- Students should understand the legal and practice site specific requirements for handling prescriptions received via written, facsimile, electronic, verbal or any other methods used at the practice site.
- Students should learn how to evaluate new and refill prescription for completeness, indication, dosing, route of administration, patient allergies, drug-drug, drug-food, and drug-disease interactions, and legal requirements.
- Students should be trained on how to collect missing information, create and modify patients' profiles accurately and efficiently.
- Students should learn how to generate and check prescription labeling for dispensed products.
- Students should learn how to select appropriate containers for dispensing finished dosage forms, select the right products from inventory, and accurately count of measure the quantity to be dispensed.
- For compounding products, students should learn how to make accurate calculations, select appropriate ingredients, make accurate measurements, and follow established good compounding procedures and good laboratory processes. In addition, students should be trained on following legal requirements and established procedures for documentation of compounding products.
- For cytotoxic and hazardous products, students should be trained on how to recognize cytotoxic/hazardous products and how to safe handling them.

2. Medication Therapy Management

- Counselling and communication skills: Students should be trained and demonstrate communication skills needed for counselling patients. These skills include but not limited to using appropriate terminologies, asking appropriate questions, listening to patients, display caring attitude, and verifying patient understanding.

- Drug information: Students should learn how to respond to patients' and healthcare providers' questions. They should also be trained on how to clarify questions, consult appropriate references, and formulate a complete, accurate and concise response.
- Documentation: Students should learn how to document interventions, interactions with patients and communications with health care providers.
- Prescription problems: Students should be able to review and evaluate prescription orders to identify and resolve any prescription problems. Students should be trained on how to interview patients and care givers to obtain information needed to evaluate prescriptions, as well as communicate prescription problems and suggest resolutions to physicians and other healthcare providers.

3. Controlled Substance

Students should be trained on procedures for procurement, storage and inventory of controlled substances as well as procedures for filling controlled substances prescriptions and disposal procedures for expired drugs.

4. Dispense and counsel over the counter products

- Students should learn how to collect information from patients to accurately assess chief complaints. They also should learn when to recommend an over the counter (OTC) treatment and when to warrant a referral to physician.
- Students should be trained on providing advices to patients on selection of OTC products categories including, but not limited to, analgesics/antipyretics, topical anti-inflammatory and anti-infective, cough/cold/allergy products, ophthalmic and otic products, vitamins and nutritional supplements, etc.
- Students should be trained on how to use therapy monitoring devices and how to explain it is importance to patients.

5. Pharmacy Management

This includes exposure to various activities of pharmacy management such as: inventory procedures including procurement & storage, billing procedures, procurement and maintenance of pharmacy equipment, compliance with regulations, and adverse event monitoring and medication errors reporting.

Activities

- Detailed case presentation.
- Patient counseling.
- Journal club.
- Any other activities assigned by the preceptor.

Ambulatory Care Rotation

The Ambulatory pharmacy rotation aims to provide students with experience and skills needed in various roles in which a pharmacist can contribute to patient care in outpatient settings.

Goals and Objectives

At the conclusion of the Ambulatory Pharmacy Practice rotation, students should gain experience or at least exposure to the following activities:

1. Medication Therapy Management

- **Counselling and communication skills:**

Students should be trained and demonstrate communication skills needed for counselling patients. These skills include but not limited to using appropriate terminologies, asking the appropriate open-ended questions, listening to patients, display caring attitude, and verifying patient understanding.

- **Drug information:**

Students should learn how to respond to patients' and healthcare providers' questions. They should also be trained on how to clarify questions, consult appropriate references, and formulate a complete, accurate and concise response.

- **Documentation:**

Students should learn how to document interventions, interactions with patients and communications with health care providers.

- **Prescription problems:**

Students should be able to review and evaluate prescription orders to identify and resolve any prescription problems. Students should be trained on how to interview patients and care givers to obtain information needed to evaluate prescriptions, as well as communicate prescription problems and suggest resolutions to physicians and other healthcare providers.

2. Patient Care

- Students should get experience on how to educate patients with regard to their disease states, therapies, and ways of monitoring and follow-up care. They should also be trained on how to perform monitoring activities to assess the efficacy and safety of prescribed drug therapies.
- Students should be trained on how to document patient care activities according to the rotation site process and procedures.

3. Disease state & Therapeutic Knowledge

- Students should have enough exposure and demonstrate knowledge of medical conditions commonly encountered in ambulatory care settings.
- Students should be able to identify areas in which pharmacists can positively impact patient care and recognize situations in which therapies which are usually recommended for a particular condition might not be suitable for a particular individual patient and to seek and recommend alternatives.

4. Clinic Management

Students should have enough exposure to various management activities of the ambulatory care clinic and understand the clinic working structure including functions of all clinic personnel and their relationships to each other and to the pharmacist.

Activities

- Reviewing patient charts.
- Attending morning meetings.
- Detailed case presentation.
- Patient counseling.
- Journal club.
- Any other activities assigned by the preceptor.

Internal Medicine Rotation

The primary goal of this rotation is to provide students with an understanding of pharmacotherapy patients followed by internal medicine. The secondary goal is to allow students to develop the skills to effectively collect and disseminate information and communicate them with patients and other healthcare practitioners.

Goals and Objectives

At the conclusion of the Internal Medicine rotation, students should gain experience or at least exposure to the following activities:

- Identify specific drug related problems for patients with acute and/or chronic illness.
- Understand the pathophysiology of patient's illness.
- Understand and discuss the therapeutic plans of patients.
- Identify and conduct monitoring of patient's drug therapy and identify any adverse drug reaction.
- Write complete and concise formal drug therapy consult note.
- Provide patient education with regard to the use, expected outcomes, and expected adverse effects of their drug therapy regimens.
- Work collaboratively with other health care providers to ensure efficacy and safety of drug therapy regimens.

Expected areas of training

Due to the variability in patient populations at different practice sites, it is hard to define specific areas of emphasis. However, some areas of emphasis that could be consistent between sites may include, but not limited to:

1. Infectious Diseases
 - Respiratory infections
 - Immunocompromised hosts
 - Sepsis syndrome
 - Skin, soft tissue, joint, and bone infections
2. Cardiology
 - Myocardial infarction
 - Angina
 - Hypertension
 - Congestive heart failure
 - Arrhythmias

- Thromboembolism
- 3. Pulmonary
 - Asthma
 - COPD
- 4. Renal
 - Acute renal failure
 - Chronic renal failure
- 5. Oncology/hematology
 - Anemias
 - Solid tumors
 - Leukemias
 - Lymphomas
- 6. Endocrinology
 - Diabetes
 - Hypothyroidism/hyperthyroidism
 - Adrenal diseases

Activities

- Reviewing patient charts.
- Attending morning meetings and daily rounds.
- Detailed case presentation.
- Patient counseling.
- Journal club.
- Any other activities assigned by the preceptor.

Elective Rotations

The descriptions of the elective rotations were adopted and modified from the following universities and institutions:

- The University of Arizona
- University of Utah
- Vancouver Island Health Authority
- Paoli Hospital
- University of Nebraska
- Ohio Northern University

Academic Rotation

Rotation Description

An academic rotation is designed to enhance student's awareness of a career in academia. The rotation will allow the student to develop a teaching style that complements their style and strengths, and all exposure to the wide range of responsibilities associated with a didactic based academic career.

Objectives

At the completion of this rotation, the student should be able to:

- Understand the different roles in the educational environments:
 - Lecture
 - Laboratory
 - Training site
- Describe and develop a teaching philosophy.
- Understand the way to assess student learning.
- List barriers for educating students.
- Develop a syllabus for a course for pharmacy students.
- Develop and deliver a lecture.
- Develop questions for quiz or exam.
- Identify characteristics necessary for effective teaching.
- Describe the responsibilities of faculty outside of the classroom.
- Understand the workings of the academic institution and how it differs from others.
- Review the NCAAA and ACPE standards.
- List the process for academic rank.
- Describe the requirements for promotion, such as publications and teaching load.

Activities

- Write and discuss with preceptor the desired objectives from this rotation.
- Case or disease state presentations and discussions for the classroom.
- Research drug information question.

- Prepare newsletter for the EEO.
- Develop a Continuing Education Program (lecture or written).
- Participation in College and University Meetings.
- Required Readings.
- Any other activities assigned by the preceptor.

Cardiology Rotation

Rotation Description

The student will have the opportunity to explore the various practice areas within the field of Cardiology.

Objectives

At the completion of this rotation, the student should be able to:

- Review the physiology of the normal cardiovascular system and its relationship to disease.
- Acquire a better understanding of the various cardiovascular disorders.
 - Examples: arrhythmias (e.g., atrial fibrillation, heart block, ventricular tachycardia), hypertension, heart failure, coronary artery disease (e.g., MI, thrombolytics), hyperlipidemia, endocarditis, anticoagulation, etc.
- Gain an understanding of the basic pharmacology of cardiac drugs.
- Evaluate medication regimens for patients with cardiovascular and related diseases.
- Select and recommend therapy for patients with acute and chronic cardiovascular diseases.
- Monitor patient-care plan for efficacy and toxicity and identify when changes are needed.
- Educate patients and health-care professionals regarding cardiovascular therapy.
- Become familiar with physical assessment of the cardiovascular system as it applies to diagnosis and the monitoring of drug therapy interventions.
- Acquire a better understanding of the various commonly used cardiovascular diagnostic and interventional procedures.

Activities

- Reviewing patient charts.
- Attending morning meetings and daily rounds.
- Detailed case presentation.
- Patient counseling.
- Journal club.
- Any other activities assigned by the preceptor.

Infectious Diseases Rotation

Rotation Description

To prepare the student with a knowledge base and problem solving skills relating to the treatment of infectious diseases with antimicrobial agents with a pharmaceutical care perspective.

Objectives

At the completion of this rotation, the student should be able to:

- Describe the etiology, incidence, pathophysiology, clinical course with complications, and medication therapies which may be considered for those infectious diseases encountered during the rotation.
- List general subjective and objective monitoring parameters which are required to follow and monitor the outcome of the patient having any infectious disease.
- List specific subjective and objective monitoring parameters utilized for the patient who may receive any one or several of the following anti-infective agents:
 - Aminoglycosides, cephalosporins, penicillin, PCN-ase resistant penicillins, clindamycin, erythromycin, azithromycin, clarithromycin, metronidazole, imipenem, aztreonam, vancomycin, chloramphenicol, trimethoprim-sulfamethoxazole, quinolones, antituberculous drugs, amphotericin, ketoconazole, fluconazole and any other anti-infective agent encountered during the rotation.
- List the therapeutic endpoints necessary for the completion of an anti-infective regimen.
- Describe and compare dosing considerations required in the general patient versus the renally impaired patient utilizing pharmacokinetics and pharmacodynamic considerations for antimicrobial agents.
- Define the mechanism of action of the various antimicrobial agents.
- List the differences in susceptibility patterns, common infecting organisms, and response to infection between the normal and compromised host.
- Define and differentiate between the various microbiologic tests (e.g. minimum inhibitory concentrations (MICs), minimum bactericidal concentrations (MBCs), serum inhibitory concentrations, etc.).
- Describe the role of the pharmacist on the infectious disease consult team.

Activities

- Reviewing patient charts.
- Attending morning meetings and daily rounds.
- Detailed case presentation.
- Patient counseling.
- Journal club.
- Any other activities assigned by the preceptor.

Nephrology Rotation

Rotation Description

This rotation will provide the student with an opportunity to evaluate and manage patients across the spectrum of renal disorders in both the inpatient and outpatient venues. The goal is to familiarize them with basic mechanisms, clinical manifestations, diagnostic strategies, and management of acute and chronic kidney disease. Depth of the exposure should be such that they can develop competency in the prevention of renal disease, indications for procedures, management of common disease and appropriate indications for referral.

Objectives

At the completion of this rotation, the student should be able to:

- Become familiar with drug therapy typically used in a renal medicine.
- Know the indications, mechanism of action and pharmacokinetics, contraindications, dosage regimen and adverse effects of most common medications that are related to the renal patients.
 - e.g. calcitriol, ACE inhibitors, ARBs, non-dihydropyridine CCB, sevelamer, calcium carbonate, aluminum hydroxide, sodium citrate, heparin, sodium bicarbonate, dextrose, epoetin, darbopoeitin, iron dextran, iron sucrose, etc.
- Become efficient in monitoring drug therapy based on renal function and type of dialysis as required.
- Know the pathophysiology, signs and symptoms, non-medication and medication management of the diseases that are associated with renal patients.
 - e.g. chronic kidney disease, mineral metabolism (calcium, phosphate, vitamin D), diabetes, hypertension, peritonitis, catheter related infections, bone disease, etc.
- Be able to calculate the creatinine clearance of a patient and know the rate of clearance via hemodialysis and/or peritoneal dialysis for the related medications.
- Be familiar with NKF/KDOQI guidelines on:
 - Anemia management, calcium-phosphate metabolism, bone disease associated with CKD, and vitamin D insufficiency/deficiency
- Develop patient assessment skills specific to a dialysis unit.
- Develop the skills to promote the rational drug therapy within a dialysis unit.
- Develop skills in evaluating, planning and monitoring appropriate drug therapy for the renal patient

Activities

- Reviewing patient charts.
- Attending morning meetings and daily rounds.
- Detailed case presentation.
- Patient counseling.
- Journal club.
- Any other activities assigned by the preceptor.

Oncology Rotation

Rotation Description

To integrate basic pharmacy-related concepts and oncology patient care through patient care activities, discussions, and selected exercises.

Objectives

At the completion of this rotation, the student should be able to:

- Neoplastic Diseases (hematologic malignancies, multiple myeloma, solid tumors, breast cancer, lung cancer, gastric cancer, colon cancer, genitourinary tract cancer, and cutaneous melanoma)
 - Describe the general course of the disease including the clinical findings, complications of disease, staging of the malignancy, and prognosis.
 - Define the goals and rational treatment programs including surgical, radiological, pharmacological, and immunological.
 - Identify the agent or combination of agents of choice including rationale, dose, schedule, and potential toxicities.
- Antineoplastic Agents
 - Discuss the pharmacology including mechanism of action, adverse reactions, and pharmacokinetics of the common cancer chemotherapeutic agents, hormonal and immunotherapeutic agents, and monitor their use in patients with cancer.
 - Recommend dosage adjustments based on renal function tests, liver function tests, and hematologic or other indices.
 - Discuss the rationale for induction, consolidation, maintenance, and adjuvant chemotherapy.
 - Describe the agents implicated, time course, reversibility, symptoms, and predisposing factors for chemotherapy-induced adverse reactions including pulmonary disease, nephrotoxicity, cardiac toxicity, neurotoxicity, hepatotoxicity, radiation recall, gastrointestinal toxicity, hematologic complications, metabolic toxicity, and secondary malignancy.
- Radiation Therapy and Surgery
 - Discuss the role of diagnostic, palliative, and curative radiation therapy and surgery in cancer management.
 - Understand the monitoring and management of the complications associated with radiation therapy and surgery.

- Extravasation
 - List drugs that are vesicants.
 - Understand the management of extravasation.
- Nausea and Vomiting
 - Discuss the pharmacology of available antiemetic.
 - Recommend appropriate therapy with consideration of the proper drug, dose, and regimen.
 - Know the relative onset, duration, and severity of nausea and vomiting with different chemotherapeutic agents.
- Pain Control
 - Discuss the pathophysiology of acute and chronic pain.
 - Describe the pharmacology of narcotic and non-narcotic analgesics.
 - Recommend a treatment plan based on the patient's needs and anticipated side effects.
- Mouth Care
 - Understand the benefits of proper oral hygiene.
 - List those agents that cause stomatitis or esophagitis.
 - Discuss the use of available agents in mouth care including side effects and contraindications.
- Discuss the use of blood products in cancer therapy including red blood cells, white blood cells, and platelets.
- Suggest premedication regimens to help reduce hypersensitivity reactions to blood products.
- Describe the types of bacterial and nonbacterial infections seen in patients with cancer.
- Recommend and monitor appropriate antibiotic therapy in patients with cancer with respect to patient specific factors.

Activities

- Reviewing patient charts.
- Attending morning meetings and daily rounds.
- Detailed case presentation.
- Patient counseling.
- Journal club.
- Any other activities assigned by the preceptor.

Pediatrics Rotation

Rotation Description

To provide the student with an advanced clinical experience that will further enhance their knowledge and skills in the management of pharmacotherapy in the pediatric population and to provide direct patient care to the pediatric patient population. Students are expected to demonstrate professional poise and confidence in knowledge, ability, and capacity to perform meaningful clinical pharmacy services.

Objectives

At the completion of this rotation, the student should be able to:

- Given a specific problem, identify the therapeutic problem, analyze clinical data, synthesize a plan, and evaluate the effectiveness of the plan.
- Identify problems concerning drug therapy including inappropriate choice of drug therapy, dosage form and dosage schedule, duplication of drugs, drug interactions, contraindications and adverse reactions.
- Communicate effectively regarding issues pertaining to drug therapy to other members of the health care team.
- Monitor drug therapy appropriately including rationale, efficacy, therapeutic endpoints, drug interactions, and real or potential adverse drug reactions in the pediatric patient.
- Perform pharmacokinetic analysis of drug therapy with respect to the pediatric patient.
- Retrieve and analyze appropriate evidence-based information important for developing a pharmacotherapeutic plan specific for a patient.
- Develop personal characteristics of behavior and deportment reflective of high standards of professional ethics, emotional maturity, and personal and professional integrity.
- Demonstrate competencies as listed above for the following disease states:
 - Reactive Airways Disease
 - Pediatric and Neonatal Sepsis and Meningitis
 - Formulas/Oral Rehydration Solutions/Gastroenteritis
 - Immunizations
 - Seizure Disorders and Febrile Seizures
 - Pediatric Cough and Cold Products
 - Type I Diabetes/DKA

- Pneumonia and Empyema
- Kawasaki Disease
- GERD

Activities

- Reviewing patient charts.
- Attending morning meetings and daily rounds.
- Detailed case presentation.
- Patient counseling.
- Journal club.
- Any other activities assigned by the preceptor.

Psychiatry Rotation

Rotation Description

To prepare the student with knowledge and skills required for recognition, diagnosis, and therapeutic planning for psychiatric disorders and monitoring the safe and effective use of psychotropic medications with a pharmaceutical care perspective.

Objectives

At the completion of this rotation, the student should be able to:

- Conduct a patient interview (under supervision of preceptor) which may include a mental status exam, chief complaint, history of present illness, past medical/psychiatric history, alcohol and drug history, family history, and medication history
- Assess patients (by interview, physical exam and/or laboratory work-up) for the presence of psychiatric ailment including substance abuse, addiction, noncompliance, and/or drug misuse.
- Recommend or initiate the collection of laboratory data relevant to developing a pharmacotherapeutic plan.
- Plan and Initiate, recommend and/or monitor the pharmacotherapy for the major psychiatric disorders and recommend interventions in drug therapy based upon the patient's presentation, symptoms and signs, lab data and adverse effects. for the following psychiatric disorders:
 - Antianxiety
 - Sedative-hypnotics
 - Antidepressants
 - Antipsychotics
 - Mood stabilizers
 - CNS stimulants
- Recognize potential drug-drug interactions with medications and recommend monitoring parameters, changes in pharmacotherapy, and alternative therapies to minimize adverse effects.
- Review, evaluate and present the psychiatric, medical, and/or pharmaceutical literature for selection of medication based on best current evidence available.
- Provide medication education and counseling (under supervision of preceptor) regarding drug therapy to psychiatric or patients and their families.
- Respond professionally to drug Information questions after searching appropriate literature sources.

Activities

- Reviewing patient charts.
- Attending morning meetings and daily rounds.
- Detailed case presentation.
- Patient counseling.
- Journal club.
- Any other activities assigned by the preceptor.

Research Rotation

Rotation Description

The research rotation is intended to provide an opportunity for the students to acquire experience in the various aspects of research. The intent of this rotation is to expose the student to as many aspects of research as possible. The rotation may be completed with faculty from various departments within the College of Pharmacy.

Prior to the rotation, the preceptor and student should design a rotation schedule that identifies the specific activities the student will perform during the 5-week period. The activities included in the schedule should be part of the actual ongoing research the preceptor is conducting. At the beginning of the rotation, the student and preceptor should review the objectives and the schedule. At the end of the rotation, the student will meet formally with the faculty member to review his experiences and the level of accomplishment for the objectives.

Objectives

At the completion of this rotation, the student should be able to:

- Prepare a one-page outline of a research protocol including goals, objectives, significance, background, study design, methods, timetable, statistical analysis plan, and budget.
- Perform statistical analysis of a set of sample data using one of the available statistical programs.
- Maintain and manage data in spreadsheet programs, such as LOTUS 1-2-3, Excel, or Access.
- Review and describe the contents of the submission documents that would be required for approval of a pilot project involving human subjects and/or animal experimentation.
- Calculate the appropriate statistical results on one sample of research data covering at least one of the following: chi-square, t-test, regression, correlation, or analysis of variance.
- Develop a research design (diagram) to test a pharmaceutical research question including a problem that allows or requires random selection, random assignment, crossover design, repeated measures, etc.
- Draft a hypothesis statement related to a selected research question and pharmaceutical theory providing both the null hypothesis and the alternate research hypothesis.

- Prepare a one-page outline of a publication of sample research findings including an introduction, background, methods, results, discussion, and conclusions. Attached to the outline should be a draft of a well-labeled, key table providing sample results and statistical tests.
- Prepare and give a formal presentation of research results collected during the rotation.

Activities

- Prepare a formal presentation of results; this presentation should be advertised in advance within the college, particularly to faculty.
- Required Readings.
- Any other activities assigned by the preceptor.

Total Parenteral Nutrition & IV Preparations Rotation

Rotation Description

To provide the student with a general understanding of issues related to specialized nutrition support and to allow the student the opportunity to develop skills in patient assessment, patient monitoring, parenteral nutrition formulation, and formula adjustment. It also provides an introduction to the sterile preparation of medications given via intravenous routes.

Objectives

At the completion of this rotation, the student should be able to:

- Evaluate the appropriateness of parenteral nutrition as the route for nutritional intervention.
- Recognize the purposes and goals of parenteral nutrition therapy.
- Estimate caloric and protein requirements for a patient and formulate a parenteral nutrition plan to meet these requirements.
- Discuss options for controlling hyperglycemia in patients receiving parenteral nutrition.
- Discuss normal fluid and electrolyte balance.
- Recognize the effects of medications on fluid and electrolyte balance.
- Discuss monitoring parameters for patients receiving parenteral nutrition including which parameters to use, how often they are checked, and interpretation of test results.
- Recognize differences between adult and pediatric parenteral nutrition guidelines and requirements.
- Recognize the general categories of enteral formulas.
- Discuss issues related to medications and tube feeding.
- Develop and integrate the knowledge related to central intravenous admixture (CIVA) preparation and dispensing, to manage, improve, and ensure safety of medication use for individual patients and groups of patients.
- Demonstrate an ability to prepare and dispense sterile preparations according to organizational policies and procedures by working in conjunction with the pharmacist and/or technician

Activities

- Attending morning meetings.
- Detailed case presentation.
- Patient counseling.
- Journal club.
- Any other activities assigned by the preceptor.