



الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

Clinical Pharmacy



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

PREFACE

- The primary goal of this document is to outline the learning objectives and thereby enrich the training experience of post-graduate trainees to enable them to become independent and competent future practitioners.
- This curriculum may contain sections outlining some regulations of training; however, such regulations need to be determined based on the “General Bylaws” and “Executive Policies” published by the Saudi Commission for Health Specialties (SCFHS), which can be accessed online through the official SCFHS website. Should a discrepancy be found in the regulation statements, the one stated in the most updated bylaws and executive policies shall apply.
- As this curriculum is subjected to periodic refinements, please refer to the electronic version posted online for the most updated edition at www.scfhs.org.sa.

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III. FOREWORD

The General Clinical Pharmacy Diploma Curriculum development team acknowledges the valuable contributions and feedback from the scientific committee members in the development of this program. We extend special appreciation and gratitude to all the members who have been pivotal in the completion of this manual, especially the Curriculum Group, the Curriculum Specialists, and the Scientific Council.



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V. INTRODUCTION

1. Context of Practice

Pharmacists play a vital role in optimizing patient care in collaboration with other healthcare professionals and work as pharmaceutical advocates. With the ever-increasing need for qualified pharmacists as integral members of the patient care team, it has become necessary to establish programs for the training of clinical pharmacists to keep pace with the needs of multiple disciplines within different healthcare sectors in the Kingdom of Saudi Arabia.

The general clinical pharmacy diploma program was first introduced in 2001 and is focused on the provision of pharmaceutical care. Initially, seven residents from seven training centers in the city of Riyadh were enrolled in the program. Due to increased demand, the number of centers was increased to nine in Riyadh (the central province), seven in western provinces, two in southern provinces, one in a northern province, and three in eastern provinces. Capacity was increased gradually to meet the needs of the healthcare sector, bringing the number of accepted candidates in 2019 to 76. However, there remains a huge gap between the need for qualified and well-trained pharmacists and current available resources.

The general clinical pharmacy diploma program qualifies graduates to work with different patient care teams to deliver integrated pharmaceutical care and comprehensive medication management (CMM) for patients in both inpatient and outpatient settings.

2. Goal and Responsibility of Curriculum Implementation

This curriculum ultimately seeks to guide trainees to become competent in their respective specialties. Accordingly, this goal requires a significant amount of effort and coordination from all stakeholders involved in



post-graduate training. As “adult-learners,” trainees must be proactive, fully engaged, and exhibit the following attributes: a careful understanding of learning objectives, self-directed learning, strong problem-solving skills, an eagerness to apply learning by means of reflective practice from feedback and formative assessment, and self-awareness and willingness to ask for support when needed. The program director plays a vital role in ensuring the successful implementation of this curriculum. Moreover, training committee members, particularly the program administrator and chief resident, have a significant impact on program implementation. Trainees should also share the responsibility in effective curriculum implementation. The Saudi Commission for Health Specialties (SCFHS) applies the best models of training governance to achieve the highest quality of training. Additionally, academic affairs in training centers and the regional supervisory training committee play a major role in training supervision and implementation. The pharmacy scientific council will guarantee that the content of this curriculum is constantly updated to match the highest standards in post-graduate education for each trainee’s specialty.

3. What is New in This Edition? (Only for the updated curricula, not the new one)

In this edition, the curriculum is transformed into a competency-based curriculum, with an explicit representation of learning domains (knowledge, skills, and behavior). In addition, it provides detailed supervisory frameworks that support independent learning within a formal structure and enriches formative assessment.

VI. ABBREVIATIONS USED IN THIS DOCUMENT

Abbreviation	Description
SCFHS	Saudi Commission for Health Specialties
D(1)	first year of diploma
D(2)	second year of diploma
ASHP	American Society of Health System Pharmacists
IRB	institutional review board
SCFHS	Saudi Commission for Health Specialties
USP	United States Pharmacopeia
ITER	In-training evaluation report
RTC	residency training committee



VII. PROGRAM ENTRY REQUIREMENTS

Please refer to the updated executive policy of SCFHS on admission and registration.

Website: www.scfhs.org.sa

VIII. LEARNING AND COMPETENCIES

1. Introduction to Learning Outcomes and Competency-Based Education

Training should be guided by well-defined “*learning objectives*” that are driven by targeted “*learning outcomes*” of a particular program to serve specific specialty needs. Learning outcomes are supposed to reflect the professional “*competencies*” and tasks that are aimed to be “*entrusted*” to trainees upon graduation. This will ensure that graduates meet the expected demands of the healthcare system and patient care in relation to their particular specialty. *Competency-based education* (CBE) is an approach of “*adult-learning*” that is based on achieving *pre-defined, fine-grained, and well-paced* learning objectives that arise from complex professional competencies.

Professional competencies related to healthcare are usually complex and contain a mixture of multiple learning domains (knowledge, skills, and attitudes). CBE is expected to change the traditional method of post-graduate education. For instance, time in training, although a precious resource, should not be looked at as a proxy for *competence* (e.g., time of rotation in certain hospital areas is not the primary marker of competence achievement). Furthermore, CBE emphasizes the critical role of informed judgment of learners’ competency progress, which is based on a staged and formative assessment that is driven by multiple workplace-based observations. Several CBE models have been developed for post-graduate education in healthcare; for example, CBE by the American Society of Health System Pharmacists (ASHP). The following are concepts to enhance the implementation of CBE in this curriculum:



- **Competency:** Competency is a cognitive construct that assesses the potential to perform efficiently in a given situation based on the standard of the profession.
- **Milestones:** Milestones are stages along the developmental journey throughout the competency continuum. Trainees throughout their learning journey, from junior to senior levels, will be assisted in transforming from being novice/supervised to master/unsupervised practitioners. This should not undermine the role of supervisory/regulatory bodies in assessing the malpractice of independent practitioners. Milestones are expected to enhance the learning process by pacing training/assessment to match the developmental level of trainees (junior vs. senior).
- **Learning Domains:** Whenever possible, efforts should be directed to annotate the learning outcomes with the corresponding domain (K=Knowledge, S=Skills, and A=Attitude). There may be more than one annotation for a given learning outcome.
- **Content-area Categorization:** It is advisable to categorize learning outcomes in broad content areas related to the practice of profession. For example, diagnostic vs. therapeutic, simple vs. complex, urgent vs. chronic, etc.

Trainees are expected to progress from the novice to the master level in a certain set of professional competencies. This curriculum applies the principles of competency-based medical education.

2. Program Duration

Two years

3. Program Rotations

The first year of the program consists of the following nine core rotations, each lasting five weeks. See Appendix A for further description of each rotation.

- Ambulatory care rotation
- Inpatient care rotation I
- Inpatient care rotation II
- Sterile preparation rotation

- Administration rotation
- Medication safety/ automation and informatics rotation
- Drug information rotation
- Clinical rotations:
 - Introduction to clinical rotation
 - Internal medicine rotation

The second year of the program consists of nine clinical rotations: six core and three elective rotations, each lasting five weeks. For more information, see the second-year rotations section.

- Core rotations:

Residents are expected to complete six rotations from the following rotations, and the resident can repeat any of the core rotations as an elective only once.

- Adult critical care rotation
- Cardiology rotation
- Infectious disease rotation
- Internal medicine rotation

- Elective rotations:

The resident can select three elective rotations from the following rotations upon approval of the residency program director:

- Ambulatory care rotation
- Emergency medicine rotation
- General pediatrics rotation
- Hematology rotation
- Nephrology rotation
- Oncology rotation
- Pain management rotation
- Pediatric critical care rotation
- Pediatric oncology rotation
- Solid organ transplant rotation
- Surgery rotation
- Parenteral nutrition rotation



1. Longitudinal experiences:

Residents must participate in the following longitudinal learning experiences:

a. Research project:

- The research project must be completed by the end of the second year.
- The completion of the research project is a mandatory requirement to sit for the second-year exam and for graduation from the residency program.
- **Important notes:**
 - **Submitting the proposal in first year:**
 - Submission of the research project proposal is a requirement for the resident to be enrolled in the first-year exam.
 - **Submitting the abstract and evaluation of the research project in the second year:**
 - The completed research must be submitted as an abstract to the residency central committee before the end of August of the second year for evaluation and scoring.
 - The resident's research project shall be evaluated by the assigned group panel according to the research project assessment form.
 - The research project score is a part of the formative assessment tool. Any resident who fails to present the research project will not be given a grade for the research project.
 - **Presentation in "Residents' Research Day":**
 - The research project must be presented in "Residents' Research Day" at the end of the second year, along with the results and conclusions of the project. Any resident who fails to present his/her research project without a valid excuse will not be awarded the graduation certificate.
 - The project presentation will be a 10–15 minute oral presentation.
 - The resident's research project shall be evaluated by the assigned group panel according to the research project presentation evaluation form (see Appendix B: Research project forms) with the option of choosing the best project(s) of the year.
 - Presentation of the interim or final results at a professional meeting is strongly encouraged.
- General guidance for research projects:
 - Generating research ideas:

- Upon starting the residency program, the resident, along with his or her residency training committee (RTC), will select the research project topic for research and be assigned a research advisor.
 - Attendance of a workshop on research design and methodology arranged by the central committee in the first few weeks of the program is compulsory for all residents.
 - It is the responsibility of each site's RTC to approve the research project topic and to supervise, along with the research mentor, the resident during the project proposal writing.
 - It is the responsibility of the resident, with the help of the RTC, to obtain the approval of the project's site institutional review board (IRB) if required.
- Developing a timeline for the completion of the research project
 - Writing the proposal:
 - All residents should follow the research project proposal format and writing guidelines.
 - The RTC is responsible for reviewing proposed research projects for merit and appropriateness based on established criteria developed by the RTC. Criteria may include, but are not necessarily limited to, the following:
 - Scientific merit, including assessment of specific objectives, experimental design and techniques, and likelihood of success
 - Relevance/significance, including potential benefits
 - Availability of resources to complete the project
 - Ability (knowledge, experience, equipment, and facilities) of the center to successfully complete the project
 - Appropriateness to a center's focus or emphasis
 - Continuing projects — evidence of productive progress
 - Data collection and analysis of results:
 - It is highly recommended (whenever possible) that the resident starts working on the data collection portion of the project in the first year.
 - The RTC should follow up and advise the resident during the data collection phase and analyze the results.



4. Mapping of Learning Objectives and Competency Roles to Program Rotations

This section aims to match the competencies, goals, and objectives related to each rotation. Trainees and trainers should work together to achieve these objectives during teaching and formative assessments. Expectations should evolve as the training level progresses (training stage, milestones).

[See Appendix A for descriptions of each rotation.](#)

IX. CONTINUUM OF LEARNING

This includes learning that should take place in each key stage of progression within the specialty. Trainees are reminded of the fact of lifelong continuous professional development (CPD). Thus, trainees should keep in mind the necessity of CPD for every healthcare provider in order to meet the demands of their vital profession. The following table shows how the role is progressively expected to develop throughout the junior, senior, and consultant levels of practice.

Undergraduate	Diploma (Junior Level)	Spatiality Residency (Senior Level)	Consultant
Non-practicing	Dependent/supervised practice	Dependent/supervised practice	Independent practice/provide supervision
Obtain basic health science and foundational level to core discipline knowledge	Obtain fundamental knowledge related to core clinical problems of the specialty	Apply knowledge to provide appropriate clinical care related to core clinical problems of the specialty	Acquire advanced and up-to-date knowledge related to core clinical problems of the specialty
Internship in the practice of discipline	Apply clinical skills related to the core presenting problems of the specialty	Analyze and interpret the findings from clinical skills to develop an appropriate management plan for the patient	Compare and evaluate challenging, contradictory findings and develop an expanded management plan



X. TEACHING METHODS

1. Program Specific Learning Activities

Program-specific activities are educational activities that are specifically designed and intended for teaching trainees during their training period. The trainees are required to attend these activities, and non-compliance can subject trainees to disciplinary actions. Program administration should support these activities by reserving time for trainees to attend these activities and allowing them to participate in such activities.

A. Educational activities:

Residents are required to deliver the following educational activities. These are the minimum requirements for the program duration.

First year

- A total of five formal topic reviews/case presentations, one of which can be a drug monograph presented to hospital-related committees. In addition, a journal club is presented to healthcare providers.

Second year

- A total of six formal topic review/case presentations, two of which can be a drug monograph presented to hospital-related committees. In addition, a journal club is presented to healthcare providers.
- Residents are expected to present in the department Grand Round

B. Other activities:

Residents shall participate in the following activities, including, but not limited to:

- Participate in an on-call schedule
- Conduct a performance improvement project
- Conduct medication use evaluation
- Prepare and present drug evaluation(s)
- Precept pharmacy students or residents during rotations
- Conduct in-services for different healthcare providers

C. Practice-based learning:

Training exposure mainly takes place during pharmacy operation rotations as well as bedside teaching during daily rounds and other work-related activities, such as, for example, courses and workshops. These activities allow the educator to supervise trainees to ensure that they become competent in the required program practical skills fulfilling knowledge, psychomotor, and/or attitude learning domains. Each trainee needs to maintain a logbook. Please refer to the formative assessment section for details on logbook requirements.

1.1 Universal Topics

Universal topics are educational activities developed by SCFHS and are intended for all specialties. Priority will be given to topics as follows:

- High value
- Interdisciplinary and integrated
- Require expertise that might be beyond the availability of the local clinical training sites

Universal topics have been developed by SCFHS and are available, as e-learning, with personalized access for each trainee to online modules. Each universal topic will include a self-assessment at the end of the module. As indicated in the “executive policies of continuous assessment and annual promotion,” universal topics are mandatory components of the criteria for the annual promotion of trainees from their current level of training to the subsequent level. Universal topics will be distributed over the course of the training period. **(A total of 20 topics must be completed per SCFHS standards.)**



Level and Specialty	Module	Topics
D1s and D2s	Module 1: Introduction	1. Prescribing drugs safely 2. Hospital acquired infections 3. Sepsis; SIRS; DIVC 4. Antibiotic stewardship
	Module 2: Cancer	1. Side effects of chemotherapy and radiation therapy 2. Cancer prevention
	Module 3: Diabetes and Metabolic Disorders	1. Recognition and management of diabetic emergencies 2. Management of diabetic complications 3. Comorbidities of obesity
	Module 4: Medical and Surgical Emergencies	1. Management of hypotension and hypertension
	Module 5: Acute Care	1. Acute pain management 2. Chronic pain management 3. Management of fluid in the hospitalized patient 4. Management of electrolyte imbalances
	Module 6: Frail Elderly	1. Assessment of frail elderly 2. Prescribing drugs to elderly patients
	Module 7: Ethics and Healthcare	1. Occupational hazards of HCW 2. Evidence-based approach to smoking cessation 3. Patient advocacy 4. Ethical issues: transplantation/organ harvesting; withdrawal of care

1.1 General Learning Opportunities

- Involvement in hospital and pharmacy-related committees and meetings
- Continuous professional activities (CPD) relevant to specialty (conferences and workshops) approved by the program director

XI. ASSESSMENT OF LEARNING

1. Purpose of Assessment

Assessment plays a vital role in the success of post-graduate training. Assessment will guide trainees and trainers to achieve defined standards, learning outcomes, and competencies. In addition, the assessment will provide feedback to learners and faculty regarding curriculum development, teaching methods, and quality of the learning environment. A reliable and valid assessment is an excellent tool for assessing curriculum alignments between objectives, learning methods, and assessment methods. Finally, assessment assures patients and the public that health professionals are safe and competent to practice.

Assessment can serve the following purposes:

- a. **Assessment for learning** refers to trainers' use of information from trainees' performance to inform their learning for improvement, which enables educators to use information about trainees' knowledge, understanding, and skills to provide feedback to trainees about learning and how to improve.
- b. **Assessment as learning** involves trainees in the learning process, which enables them to monitor their own progress. Trainees use self-assessments and educators' feedback to reflect on their progression, which develops and supports trainees' metacognitive skills. Assessment as learning is crucial in helping residents/fellows become lifelong learners.
- c. **Assessment of learning** demonstrates learning achievements. This is a graded assessment and usually counts toward the trainee's end-of-training degree.



d. **Feedback and evaluation** assessment outcomes will represent quality metrics that can improve the learning experience.

2.2 Formative Assessment Tools

Knowledge			
No	Gen/Sub	D1 Year (includes D1 to D2 Promotion)	D2 (Graduation)
1	Academics	Complete 20 CME hours (Through: conferences, workshops, courses, departmental CE, etc.) -All CME's must be reported on Mumaris	Complete 20 CME hours (Through: conferences, workshops, courses, departmental CE, etc.) -All CME's must be reported on Mumaris
20 Universal Topics per training period			
2	End-of-Year Progress Test	Promotion Exam	Certificate of Training Completion
Skills			
3	Research	Resident should have the following: Research idea, written proposal, submit to IRB, and obtained IRB approval or similar in his/her hospital	Abstract needs to be submitted and evaluated by the research committee of the regional training committee
4	Logbook	One Drug monograph Five Medication Error Reports With analyzing system-based problem and strategies to prevent their reoccurrence. Ten Patient Counseling records with supervision Five Medication Reconciliation reports with supervision Staffing: R1: 2-4 shifts/month (Min. 12 shifts – Max. 24 shifts per training year)	Five Case presentations in SOAP format for each clinical rotation that covers major topics in the rotation and may include the following longitudinal activities either imbedded or separate (total 45 cases) - PK or TDM consults (10/year) - Anticoagulation consults (5/year) - Adverse drug events report and analyzing probability of ADR (10/year) Staffing: R2: 2-4 shifts/month (Min. 16 shifts – Max. 32 shifts per training year) R3: 2-4 shifts/month (Min. 12 shifts – Max. 24 shifts per training year)
5	Volunteering	Participate in at least one volunteering-based activity such as awareness campaign, presenting a lecture to the community, etc.	Participate in at least one volunteering-based activity such as awareness campaign, presenting a lecture to the community, etc.
Attitude			
6	ITERS (In-training Evaluation Reports)	End of rotation evaluations scores. Resident must successfully complete 7 rotations to be eligible for the promotion exam. Resident must successfully complete 9 rotations to be promoted to R2.	End of rotation evaluations scores. Resident must successfully complete 7 rotations to be eligible for the exam. Resident must successfully complete 9 rotations for graduation.

The evaluation of each component will be based on the following equation:

Percentage	< 50%	50–59.4%	60–69.4%	> 70%
Description	Clear fail	Borderline fail	Borderline pass	Clear pass

To achieve promotion without conditions, the candidate must score a minimum of “borderline pass” in all five components.

- The program director can still recommend the promotion of candidates if the above standard is not met in some situations:
- If the candidate scored “borderline fail” in one or two components at maximum, and these scores do not belong to the same area of assessment (e.g., both borderline fails should not both belong to skills).
- The candidate must have passed all the other components and scored a minimum of clear pass in at least two components.

3. Summative Assessment

3.1 General Principles

Summative assessment is a component of assessment that primarily aims to make informed decisions on trainees' competency. In comparison to a formative assessment, *summative assessment* does not aim to provide constructive feedback. For further details on this section, please refer to the general bylaws and executive policy of assessment (available online at www.scfhs.org). To be eligible to sit for the final exams, trainees will be granted a "Certification of Training Completion" upon successful completion of all training rotations.

3.2 First Part Examination (If applicable)

This is applicable only to residency programs. It is a written exam that permits the trainee to be promoted from the "junior" level to the "senior" level of training. For further details on the first part of the examination, please refer to general bylaws and executive policy of assessment (available online at www.scfhs.org).

3.4 Certification of Training-Completion

To be eligible to sit for the final specialty examinations, each trainee is required to obtain a "*Certification of Training Completion*." Based on the training bylaws and executive policy (please refer to www.scfhs.org), trainees will be granted a "Certification of Training Completion" once the following criteria are fulfilled:

- a. Successful completion of all training rotations
- b. Completion of training requirements (e.g., logbook, research, and others) as approved by the scientific council of specialty
- c. Clearance from SCFHS training affairs, which ensures compliance with tuition payments and the completion of universal topics
- d. Pass the first part examination (when applicable)

A "Certification of Training Completion" will be issued and approved by the supervisory committee or its equivalent according to SCFHS policies.



3.5 Final Specialty Examinations

The final specialty examination is the summative assessment component that grants trainees the specialty's certification. It comprises two elements:

- a) Final written exam: In order to be eligible for this exam, trainees are required to have a "Certification of Training-Completion."
- b) Final clinical/practical exam: Trainees are required to pass the final written exam to be eligible to sit the final clinical/practical exam.

Blueprint Outlines: Please refer to the most updated version published on the SCFHS website.

Promotion examination:

<https://www.scfhs.org.sa/en/MESPS/TrainingProgs/List%20graduate%20programs/Documents/General%20Clinical%20Pharmacy%202020%20Promotion%20Exam%20Blueprint.pdf>

Final written examination:

<https://www.scfhs.org.sa/en/MESPS/TrainingProgs/List%20graduate%20programs/Documents/General%20Clinical%20Pharmacy%20Board-Final%20Written%20Exam%20Blueprint%20v.1.pdf>

Saudi board final clinical examination of general clinical pharmacy:

<https://www.scfhs.org.sa/en/MESPS/TrainingProgs/List%20graduate%20programs/Documents/Blueprint%20-General%20pharmacy%202020.pdf>

XII. PROGRAM AND COURSES EVALUATION

SCFHS applies variable measures to evaluate the implementation of this curriculum. The training outcomes of this program will undergo scrutiny to ensure it conforms to the quality assurance framework endorsed by the Central Training Committee at SCFHS. Trainees' assessment (both formative and summative) results will be analyzed and mapped to curriculum content. Other indicators that will be incorporated are as follows:

- Report of the annual trainees' satisfaction survey
- Reports from trainees' evaluation of faculty members
- Reports from trainees' evaluation of rotations
- Reports from the annual survey of program directors
- Data available from program accreditations
- Reports from direct field communications with trainees and trainers

Goal-based evaluation: the intended achievement of milestones will be evaluated at the end of each stage to assess the progress of the curriculum delivery, and any deficiency will be addressed in the following stage utilizing the time devoted to trainee-selected topics and professional sessions.

In addition to subject-matter opinion and best practices from benchmarked international programs, SCFHS will apply a robust method to ensure that this curriculum utilizes all data that available during the revision of this curriculum in the future.



XIII. POLICIES AND PROCEDURES

This curriculum represents the means and materials that outline the learning objectives with which trainees and trainers will interact to achieve the identified educational outcomes. SCFHS has a full set of “General Bylaws” and “Executive Policies” (published on the official SCFHS website) that regulate all training-related processes. The general bylaws of training, assessment, and accreditation, as well as executive policies on admission, registration, continuous assessment and promotion, examination, trainees’ representation and support, duty hours, and leaves are examples of regulations that need to be implemented. Under this curriculum, trainees, trainers, and supervisors must comply with the most updated bylaws and policies, which can be accessed online (via the official SCFHS website).

XIV. APPENDICES

A. Descriptions of First- and Second-Year Rotation

B. Appendix-B: Common Topics/Disease State Encounters

C. Glossary

Appendix-A: Description of First- and Second-Year Rotations

First Year Rotations

Orientation

Orientation week is a one-week required period in the first year of the residency program. The residency program director with the program coordinator will orient/schedule the following when required and applicable:

1. Hospital orientation
2. Training site orientation
3. Health-system orientation
4. Design of the residency program
5. The residency program manual
6. Expectations and responsibilities of the resident
7. Resident schedule
8. Residency evaluation & progress tracking
9. All scheduled meetings
10. Training site policy and procedures
11. Residency policies and regulation
12. Generating ideas for research projects
13. Residency binder to contain all residency pertinent documentation and instructions on how to arrange it



14. Reading material, for example, introduction to clinical research for residents' booklet and the ethics handbook for residents from the SCFHS website
15. Any other requirements assigned by the residency program director

Ambulatory Care Rotation

Ambulatory care rotation is a five-week core rotation in the first year of the residency program. This rotation also includes extemporaneous preparations, inventory control, narcotics, and controlled drug substances in addition to verification/entering of different types of medication orders.

Goals:

1. To introduce the resident to the pharmacist's role in an ambulatory setting
2. To introduce and familiarize the resident with the department's distribution and compounding system
3. To introduce the resident to the pharmacist's role in handling and managing controlled substances,
4. inventory, and supplies

Objectives:

At the completion of the rotation, the resident should be able to:

1. Demonstrate the ability to perform the following activities:
 - a. Receive prescriptions/orders
 - b. Assess the appropriateness of prescriptions/orders details (appropriate indication, dosing, frequency, duration, and allergies, interactions, therapeutic duplication and contraindications, etc.)
 - c. Handle orders for narcotics and controlled medications
 - d. Handle orders for high alert medications
 - e. Handle orders for restricted and non-formulary medications
 - f. Handle orders for cytotoxic medications
 - g. Verify and check prescriptions/orders
 - h. Recommend alternative for out-of-stock medication
 - i. Fill prescriptions/orders
 - j. Perform pharmaceutical calculations
 - k. Perform extemporaneous compounding (suspension, creams & ointments, syrups, emulsion, etc.)
 - l. Double-check prepared medications
2. Demonstrate knowledge of the policy and procedure related to ambulatory care services

3. Demonstrate knowledge of American Society of Health-System Pharmacists (ASHP) recommendations related to ambulatory care services
4. Demonstrate knowledge of common references used for extemporaneous preparation
5. Demonstrate effective communication skills for interviewing/counseling patients, demonstrate techniques to enhance patient compliance (i.e., communicate to the patient the importance of taking their medication regularly, demonstrate and assess patient understanding of metered dose inhalers, spacers, etc.).
6. Demonstrate effective communication skills with the physicians for order/prescription clarification when needed
7. Respond appropriately to drug information inquiries from patients and other health care providers and select the best available resource for answering drug-related questions
8. Demonstrate the ability to perform common pharmaceutical calculations
9. Recognize the pharmacy management system (manual or electronic prescribing system) in ambulatory care settings, explain the principles, advantages, and disadvantages of each system
10. Recognize the medication dispensing system (robotic or manual system) in ambulatory care settings
11. Explain medication errors definition and classification, identify preventive strategies, and error management and documentation processes
12. Demonstrate the ability to understand and perform the following in the narcotic and controlled sections:
 - a. Ordering, receiving and storage, auditing, inventory and disposal of controlled medications
 - b. Preparing the quarterly reports for the Ministry of Health (MOH)
 - c. Describing the classification system of controlled substances and narcotics in Saudi Arabia and the individual requirements for narcotics and psychotropic medications
13. Demonstrate knowledge of policies and procedures related to controlled substances
14. Demonstrate knowledge of the national laws and regulations of controlled substances, narcotics, and psychotropic medications



15. Comprehend the classification system of controlled substances and narcotics
16. Demonstrate the ability to understand and perform the following in the narcotic and controlled substances sections:
 - a. Purchasing/inventory control system terminology
 - b. Handling of short-dated items
 - c. Describing storage requirements of flammable items, acids, chemotherapeutic agents, frozen items, refrigerated items, narcotics
 - d. Purchasing and receiving drug supplies from overseas/local suppliers
 - e. Maintaining and controlling inventory of drug supplies
 - f. Processing recall medications
 - g. Processing borrowing/lending medications to other hospitals
17. Demonstrate knowledge of the policies and procedures related to inventory control

Suggested reading materials:

1. The latest version of ASHP Guidelines — Minimum Standard for Pharmaceutical Services in Ambulatory Care
2. National Narcotic and Controlled Substances Rules and Regulations (in Arabic) 1431/2011
3. Administrative Policies and Procedures for MOH hospitals /PHC Centers

Inpatient Care Rotation I & II

Inpatient care rotations I and II are five-week core rotations in the first year of the residency program. They include filling of automated dispensing machine/cassette filling and order processing in the main and satellite pharmacy areas.

Goals:

To introduce the resident to the pharmacist's role in an inpatient pharmacy setting.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Demonstrate the ability to perform the following activities:
 - a. Assess the appropriateness of prescriptions/orders details (appropriate indication, dosing, frequency, duration, and allergies, interactions, therapeutic duplication and contraindications, etc.)
 - b. Handle orders for narcotics and controlled medications

- c. Handle orders for high alert medications
 - d. Handle orders for restricted and non-formulary medications
 - e. Handle orders for cytotoxic medications
 - f. Fill cassettes/automated dispensing cabinets
 - g. Check medication cassettes
 - h. Compound extemporaneous preparation
 - i. Double-check filling and extemporaneous compounding done by other staff
 - j. Perform medication floor stock inspection in the nursing station
 - k. Perform common pharmaceutical calculations
 - l. Participate in daily quality control checks related to the inpatient area.
 - m. Participate in daily activities for controlled substances
 - n. Perform medication reconciliation
 - o. Participate in cardiopulmonary resuscitation
2. Demonstrate knowledge of policies and procedures related to inpatient pharmacy
 3. Demonstrate knowledge of American Society of Health-System Pharmacists (ASHP) recommendations related to inpatient services
 4. Recognize different types of drug distribution systems, including floor stock, unit dose, and automated system in the inpatient area, and explain the principles, advantages, and disadvantages of each system.
 5. Recognize centralized and decentralized pharmacy systems and explain the principles, advantages, and disadvantages of each system.
 6. Demonstrate familiarity with the United States Pharmacopeia (USP) Chapter <795> Pharmaceutical Compounding — Non-sterile Preparations Guidelines in Pharmacy Practice.
 7. Comprehend the national laws and regulations of controlled substance, narcotics, and psychotropic medications
 8. Comprehend the classification system of controlled substances and narcotics
 9. Explain medication errors definition and classification, identify preventive strategies, and error management and documentation processes.
 10. Demonstrate knowledge of policies related to expired medications
 11. Recognize emergency medication in the code box with their indications and medication and policies related to cardiopulmonary resuscitation



12. Demonstrate effective communication skills with physicians for order clarification when needed
13. Respond appropriately to drug information inquiries from patients and other health care providers and select the best available resource for answering drug-related questions

Suggested reading materials:

The latest version of:

1. ASHP statement on unit dose drug distribution
2. ASHP statement on the pharmacist's responsibility for distribution and control of drug products
3. ASHP technical assistance bulletin on hospital drug distribution and control
4. ASHP technical assistance bulletin on single unit and unit dose packages of drugs
5. ASHP technical assistance bulletin on repackaging oral solids and liquids in single unit and unit dose packages
6. Drug distribution and control: preparation and handling positions
7. ASHP guidelines on handling hazardous drugs
8. ASHP technical assistance bulletin on compounding non-sterile products in pharmacies

Sterile Preparation Rotation

Sterile preparation rotation is a five-week core rotation in the first year of the residency program. It includes preparation of all types of sterile products, followed by processing and double-checking the sterile medication products.

Goals:

To introduce the resident to the pharmacist's role in the preparation and double-checking of sterile products.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Demonstrate the ability to perform the following activities:
 - a. Prepare sterile preparation under aseptic technique
 - b. Prepare cytotoxic, hazardous medications under aseptic technique and with special requirements
 - c. Prepare parenteral nutrition bags

- d. Prepare medications for adult and pediatric patients (small volume, large volume, syringe)
 - e. Perform pharmaceutical calculation
 - f. Process IV medication orders, taking into consideration dosing, disease, age, weight contraindications, allergies, and labs (when appropriate) for patients
 - g. Check completed intravenous preparations for proper labeling, components, and quantity
2. Demonstrate knowledge of policies and procedures related to sterile preparation
 3. Demonstrate knowledge of policies and procedures related to chemotherapy and hazardous preparation
 4. Demonstrate knowledge of United States Pharmacopeia (USP) Chapter 797 Pharmaceutical Compounding Sterile Preparations guidelines
 5. Demonstrate knowledge of United States Pharmacopeia (USP) Chapter 800: Hazardous Drugs — Handling in Healthcare Settings
 6. Demonstrate knowledge of the American Society of Health-System Pharmacists (ASHP) recommendations related to sterile preparation, cytotoxic, and hazardous medications
 7. Demonstrate knowledge of the aseptic technique, including proper hand hygiene, proper preparation of the work area, proper handling of equipment and supplies, and proper storage of IV fluids and medication.
 8. Recognize the medication preparation system (robotic or manual system) in the sterile preparation areas and explain the principles, advantages, and disadvantages of each system.
 9. Describe the different routes and methods of parenteral drug administration and the advantages and limitations of each.
 10. Perform proper storage of sterile preparations
 11. Explain the proper method of sterile preparations delivery
 12. Perform label generation and updates
 13. Perform parenteral nutrition calculation
 14. Describe the principles of parental nutrition (PN), including formulation of specialized solutions for different patient populations
 15. Answer phone calls and resolve problems raised by callers
 16. Participate in a training program for aseptic techniques



17. Recognize all records and workload reports required for the sterile preparation area
18. Recognize daily quality control checks related to the sterile preparation area

Suggested reading materials:

The latest version of:

1. ASHP guidelines on quality assurance for pharmacy-prepared sterile products
2. ASHP guidelines on handling hazardous drugs
3. ASHP technical assistance bulletin on handling cytotoxic and hazardous drugs
4. ASHP technical assistance bulletin on pharmacy-prepared ophthalmic products
5. Safe practices for parenteral nutrition formulations

Administration Rotation

Administration rotation is a five-week core rotation in the first year of the residency program.

Goals:

1. To provide residents with exposure to and an understanding of the scope and functions of a pharmacy manager
2. To provide residents with supervised education in various aspects of health system pharmacy administration, including resources, management, personnel management, performance improvement and quality assurance, project/program management, hospital-wide interdisciplinary issues, clinical pharmacy services, strategic and short-term pharmacy planning, departmental goals and objectives, policy development and review, pharmacy organizational structures, different styles of managerial hierarchies and information systems, and budgeting.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Describe the numerous areas of the pharmacy department and the services each provides
2. Discuss the advances in pharmacy distribution systems and how to help implement them
3. Participate in daily topic discussions on issues relating to practice management, leadership, and healthcare/pharmacy issues

4. Describe the process of managing the practice area's human resources and implementing improvements to current procedures
5. Describe how to estimate the real need for manpower to run all expected pharmaceutical care activities
6. Contribute to the development of a new pharmacy service or to the enhancement of existing services
7. Contribute to the achievement of pharmacy goals through effective participation in committees and informal work groups
8. Gain knowledge and skills related to pharmacy practice management
9. Define the requirements and process to ensure departmental compliance with accreditation, legal, regulatory, and safety requirements
10. Participate in the development and implementation of selected pharmacy departmental policies and procedures
11. Work on project(s) to find alternative methods to help pharmacy departments reduce workloads and overcome staff shortages
12. Suggest new activities that enable pharmacists to be patient care focused
13. Improve communication with pharmacy staff, nursing departments, physicians, and other hospital departments that, in turn, improve patient care

Suggested Reading Materials:

1. JCIA Accreditation Standards for Hospitals
2. ASHP PPMI summit recommendations (Am J Health Syst Pharm June 15, 2011, p. 68)
3. Latest version of ASHP policy positions and statements:
 - a. Pharmacy Department Business Partnerships
 - b. Integration of Pharmacy Services in Multi-Facility Health Systems
 - c. Proliferation of Accreditation Organizations
 - d. Workload Monitoring and Reporting
 - e. Pharmacist Leadership of the Pharmacy Department
 - f. Pharmacy Staff Fatigue and Medication Errors
 - g. Roles and Responsibilities of the Pharmacy Executive
 - h. Standards-Based Pharmacy Practice in Hospitals and Health Systems
4. Introduction to Hospital and Health-System Pharmacy Practice, ASHP



Medication Safety/Automation and Informatics Rotation

Medication safety/automation and informatics rotation is a five-week core rotation in the first year of the residency program.

Goals:

1. To introduce the resident to the pharmacist's role as medication safety officer.
2. To understand the role of pharmacy informatics and automation section, technologies, and teamworks
3. To exercise leadership and practice management skills, with a specific focus on pharmacy
4. informatics leadership
5. To understand the importance of pharmacy informatics as an integral component of the
6. development and maintenance of an electronic health record (EHR)

Objectives:

At the completion of the rotation, the resident should be able to:

1. Demonstrate familiarity with the following activities in medication safety:
 - a. Describe the role of a medication safety officer
 - b. Define the hospital medication use process and medication safety related policies and definitions
 - c. Participate in ongoing hospital/ pharmacy medication safety projects and activities
 - d. Review and understand the process of identifying the root cause/s of any adverse drug event in particular, and the error-prone situations in general
 - e. Explain the role of the hospital events reporting system in medication safety; how to increase reporting and use reported events to enhance medication safety
 - f. Review and understand the process for implementing corrective actions for medication-related errors at both the individual event level and the aggregate event level, and how this information is utilized and communicated to staff.
 - g. Recognize The Joint Commission International medication/pharmacy-related standards (e.g.,. Medication Management and Use (MMU) and international patient safety goals (IPSG), or any other accreditation agency as applicable to the organization

- h. Participate in the pharmacy accreditation continuous compliance team activities and inspection visits
 - i. Identify medication management best practices that could potentially be incorporated into practice at hospitals that improve medication safety and quality of care
 - j. Participate in reviewing/updating medication safety related policies when applicable
 - k. Review several national/international medication safety posts and alerts; utilize the information provided to identify areas for improvement to promote safe medication practices for patients.
2. Demonstrate familiarity with the following activities in automation:
- a. Demonstrate knowledge of basic pharmacy informatics principles, standards, enterprise electronic medication management, and best practices
 - b. Demonstrate knowledge of available technology and automation systems for prescribing medications
 - c. Demonstrate knowledge of currently available pharmacy informatics solutions and automated technologies for order dispensing, administration, and inventory management.
 - d. Participate in the implementation or evaluating of a technology or a pharmacy automation system
 - e. Design, execute, and report results of investigations of pharmacy informatics-related tasks or issues
 - f. Evaluate the validity of information and knowledge in an organization's technology and pharmacy automation systems
 - g. Understand project and change management methodologies commonly used in pharmacy informatics and automation projects
 - h. Gather, analyze, and document user requirements; identify problem areas and recommend possible solutions
 - i. Evaluate opportunities for improving patient outcomes by improving the safety and quality of the medication-use system through the application of informatics principles, standards, and best practices.
 - j. Demonstrate knowledge of currently available electronic surveillance systems, including Adverse drug reactions (ADRs) for effects monitoring
 - k. Comprehend the clinical support decision system (CDSS) and evaluate one of our medication decision support systems



- l. Evaluate opportunities for improving patient outcomes by improving the safety and quality of the medication-use system through the application of informatics principles, standards, and best practices
- m. Describe data analytics, key performance indicators, data warehouse design; participate in daily monitoring of systems and daily report resolution/generation
- n. Recognize risk management and participate in contingency planning and downtime procedures

Suggested Reading Materials:

The latest version of:

1. ASHP policy for automation and information technology
2. ASHP statement on the pharmacist's role in clinical informatics
3. ASHP statement on the pharmacy technician's role in pharmacy informatics
4. ASHP guidelines on the safe use of automated dispensing devices
5. Health Care Informatics: A Skills-Based Resource, ASHP
6. Best Practices for Health-System Pharmacy
7. Pharmacy Informatics textbook by Philips
8. Building Core Competencies in Pharmacy Informatics textbook
9. ASHP guidelines on preventing medication errors in hospitals
10. ASHP statement on the role of the medication safety leader
11. ASHP Guideline on preventing medication errors in hospitals
12. Medication Errors, Michael Cohen APha. 2nd edition
13. Medication Safety; A guide for healthcare facilities, Manasse Thompson, ASHP
14. Acute Care; ISMP Medication Safety Alert
15. Pathways for Medication Safety, Leading a Strategic Planning Effort; A Partnership: American Hospital Association, Health Research and Education Trust, Institute for Safe Medication Practices.

Drug Information Rotation

Drug information rotation is a five-week core rotation in the first year of the residency program.

Goals:

To introduce the resident to the pharmacist's role in the drug information center.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Participate in the development, organization, and operation of the Drug Information Services center
2. Gain proficiency in the use of printed and online primary, secondary, and tertiary resources
3. Utilize enhanced written and verbal communication skills
4. Apply their knowledge of physiology, pharmacology, and pharmacotherapeutics to the provision of drug information
5. Recognize the organization and responsibilities of the Drug Information Service center
6. Discuss a systematic approach to the processing of a drug information request
7. Differentiate between primary, secondary, and tertiary resources, including their individual uses, advantages, and disadvantages
8. Evaluate, describe, compare, and contrast printed and online resources
9. Demonstrate proficiency in the search and application of printed and online primary, secondary, and tertiary resources
10. Complete and present a formulary monograph for the Pharmacy and Therapeutics Committee or other appropriate written assignments.
11. Demonstrate competency in the assessment and evaluation of drug literature

Suggested Reading Materials:

The latest version of:

1. ASHP statement on the pharmacy and therapeutics committee
2. ASHP statement on the formulary system
3. ASHP guidelines on formulary system management
4. ASHP guidelines on preventing medication errors in hospitals
5. ASHP statement on pharmaceutical care
6. ASHP guidelines on a standardized method for pharmaceutical care
7. ASHP statement on the pharmacist's role in infection control

Introduction to Clinical Practice Rotation

Introduction to clinical practice rotation is a five-week core rotation in the first year of the residency program.



Goals:

To provide foundation knowledge and skills as an introduction to core practices in clinical pharmaceutical care, integrating theoretical learning with an exploration of relevant clinical processes, including some clinical observations.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Demonstrate competency and efficiency in reviewing the different sections of a patient's chart
2. Describe the key components of diagnostic physical examinations and relate the influence of the drug to this process
3. Identify pertinent diagnostic procedures that apply to specific settings
4. Demonstrate competency in interpreting the results of common laboratory tests: normal values, sensitivity/specificity, and laboratory errors
5. Identify and gather subjective and objective data necessary to monitor therapy for efficacy and safety
6. Actively participate in daily multidisciplinary patient care team rounds
7. Prepare and present a minimum of two patient cases/day (20–30 minutes each, handout not longer than two pages) using the S.O.A.P (subjective, objective, assessment, plan) format. This should include the following:
 - a. Demographic data such as age, sex, race, weight, etc.
 - b. Chief complaint (CC)
 - c. History of present illness (HPI)
 - d. Patient medical history (PMH)
 - e. Social history (SH)
 - f. Family history (FH)
 - g. Medication history (Medication reconciliation)
 - h. Medication allergy and ADR
 - i. Physical examination (head-to-toe)
 - j. Labs
 - k. Problem list
8. Formulate therapeutic management plan for drug and non-drug therapies
9. Use primary literature and reference sources to effectively answer questions

10. Prioritize daily workload based on information obtained during rounds
11. Perform a minimum of two pharmacokinetics consultations and chart documentation daily

Internal Medicine Rotation

Internal medicine rotation is a five-week core rotation in the first year of the residency program.

Goals:

To provide residents with experience in pharmacotherapeutic management of adult patients with common acute and chronic medical illnesses.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Discuss the etiology, pathophysiology, and treatment (drug and non-drug) of disease states commonly found in adult internal medicine patients: diabetes mellitus, thyroid disorder, asthma and chronic obstructive pulmonary disease COPD, seizure, anemia, thrombosis (Deep vein thromboembolism (DVT) and pulmonary embolism (PE)), peptic ulcer disease, gastroesophageal reflux, inflammatory bowel disease, hypertension, acute and chronic pain, arthritis, acute and chronic renal failure, urinary tract infections, pneumonia, and depression
2. Develop skills in evaluating patient data for the following purposes: promoting pharmaceutical care and optimal drug therapy, identifying drug-therapy-related problems, and developing rational drug therapy recommendations
3. Develop a basic understanding of the various diagnostic and monitoring techniques utilized with internal medicine patients
4. Confidently and effectively communicate with patients and health care providers regarding disease states and pharmacotherapy
5. Develop/enhance teaching skills by presenting formal and informal cases, in-services, and lectures.
6. Develop knowledge of the role of a clinical pharmacist in patient care and understand the value of becoming an integral team member

Second Year Rotations

Adult Critical Care Rotation

Adult critical care is a five-week core rotation in the second year of the residency program.



Goals:

To develop the resident's skills in identifying and resolving drug-related problems in critically ill patients using evidence-based primary literature in the area of critical care therapeutics.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Discuss the pathophysiology, management, and monitoring of the following disease states, and apply this knowledge to the pharmaceutical care of patients encountered during rotations in the areas of:
 - a. Acid-base balance
 - b. Head injury/intracranial bleeding
 - c. Seizures
 - d. Meningitis
 - e. Infection in critically ill patients
 - f. Severe sepsis and septic shock
 - g. Pain, agitation, and delirium in the intensive care unit (ICU)
 - h. Respiratory failure
 - i. Adult respiratory distress syndrome
 - j. Renal failure (acute and chronic)
 - k. Diabetic ketoacidosis
 - l. Hypertensive emergencies/urgencies
 - m. Shock syndrome and complications
 - n. Trauma
 - o. Burn
 - p. Pharmacokinetics in critically ill patients
 - q. Drug overdose
 - r. Venous thromboembolism prophylaxis
 - s. Stress ulcer prophylaxis
 - t. Demonstrate competency in monitoring drug therapy and fluid electrolyte therapy

2. Apply pharmacokinetic and pharmacodynamic principles of critically ill patients and recommend serum drug concentration sampling times to achieve cost-effective drug monitoring
3. Determine the need for fluid and electrolyte therapy and recommend appropriate diluents and admixture concentrations to meet patient-specific needs
4. Work with nursing staff to ensure safe, accurate, and correct administration of medications
5. Balance efficacy data with information on drug cost and other formulary considerations when recommending therapeutic alternatives
6. Develop an understanding of the role of a clinical pharmacist within an ICU

Cardiology Rotation

Cardiology rotation is a five-week core rotation in the second year of the residency program.

Goals:

To develop the knowledge, practice patterns, attitudes, and skills necessary to provide excellent care in cardiovascular pharmacy practice. Residents will have the opportunity to develop clinical skills, analyze patients' problems, and make treatment plans through exposure to a wide variety of patients with cardiac disease.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Understand the pathophysiology and pharmacotherapy of disease states commonly seen in critical care units, including:
 - a. Atrial and ventricular arrhythmias
 - b. Coronary artery disease/angina
 - c. Congestive heart failure
 - d. Acute myocardial infarction
 - e. Cardiogenic shock
 - f. Cardiac arrest/cardiopulmonary resuscitation
2. Discuss the pathophysiology, management, and monitoring of any additional disease states as directed by the preceptor
3. Discuss cardiovascular risk factors and issues in their drug therapy and apply this information to the pharmaceutical care of specific patients



4. Discuss the role of education in the management of cardiac disease and the contributions of various team members in providing education to cardiac patients.
5. Comprehend the pharmacokinetics of drugs used in the critical setting and how these parameters may change in critically ill patients
6. Comprehend the role of a clinical pharmacist within an ICU
7. Monitor the progression of diseases or effects of therapy by using clinical symptoms, laboratory data, information generated by hemodynamic monitoring techniques, and other relevant data
8. Demonstrate competency in monitoring drug therapy and fluid and electrolyte therapy
9. Demonstrate skills in providing drug information and therapeutic recommendations to physicians and nurses within critical care units in a professional manner

Infectious Disease Rotation

Infectious disease rotation is a five-week core rotation in the second year of the residency program.

Goals:

To provide an opportunity for residents to gain insights into the management of infectious diseases and antimicrobial utilization.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Discuss the pathophysiology, microbiology, management, and monitoring of the following infections or class of infections, and apply this knowledge to patients during rotations:
 - a. Pneumonia (hospital and community acquired)
 - b. Meningitis
 - c. Urinary tract infection
 - d. Osteomyelitis
 - e. Pelvic infection
 - f. Sexually transmitted disease
 - g. Intra-abdominal infection
 - h. Cellulitis

- i. Septic shock
 - j. Endocarditis
 - k. Fungal/viral infection
 - l. Parasitic infection
 - m. Tuberculosis and infection in immunocompromised hosts
2. Describe the rationale, guidelines, and considerations for both surgical and non-surgical antimicrobial prophylaxis and apply this information to the pharmaceutical care of patients encountered during rotations
 3. Describe the etiology, pathogenesis, prevention, and control of hospital-acquired infections and apply this information to the pharmaceutical care of patients encountered during rotations
 4. Demonstrate knowledge of the most commonly implicated microorganisms, lab tests used, and treatment options for appropriate disease states
 5. Discuss how to manage patients with infectious diseases and the use of antimicrobial agents:
 - a. Initial empiric therapy vs. documented therapy for infection
 - b. Routes of antimicrobial administration
 - c. Dose and duration of antimicrobial therapy
 - d. Monotherapy vs. combination therapy
 - e. Monitoring parameters
 6. Develop knowledge of the role of the clinical pharmacist in the care of patients with infectious diseases and the management of appropriate antimicrobial utilization in the institutional setting

Internal Medicine Rotation

Internal medicine rotation is a five-week core rotation in the second year of the residency program.

Goals:

To provide residents with experience in pharmacotherapeutic management of adult patients with common acute and chronic medical illnesses.

Objectives:

At the completion of the rotation, the resident should be able to:



1. Discuss the etiology, pathophysiology, and treatment (drug and non-drug) of disease states commonly found in adult internal medicine patients: diabetes mellitus, thyroid disorder, asthma and COPD, seizure, anemia, thrombosis (DVT and PE), peptic ulcer disease, gastroesophageal reflux, inflammatory bowel disease, hypertension, acute and chronic pain, arthritis, acute and chronic renal failure, urinary tract infections, pneumonia, and depression
2. Develop skills in evaluating patient data for the following purposes: promoting pharmaceutical care and optimal drug therapy, identifying drug-therapy-related problems, and developing rational drug therapy recommendations.
3. Develop a basic understanding of the various diagnostic and monitoring techniques utilized with internal medicine patients
4. Confidently and effectively communicate with patients and health care providers regarding disease states and pharmacotherapy.
5. Develop/enhance teaching skills by presenting formal and informal cases, in-services, and lectures
6. Develop knowledge of the role of a clinical pharmacist in patient care and understand the value of becoming an integral team member

Clinical Ambulatory Care Rotation

Clinical ambulatory care rotation is a five-week elective rotation in the second year of the residency program.

Goals:

To develop skills and gain experience in various roles in which pharmacists contribute to patient care in ambulatory settings.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Conduct a patient/caregiver interview to gather information about the patient's medication therapy and health status with consideration of the patient's culture and level of education
2. Discuss the pathophysiology and pharmacotherapy of disease states commonly seen in ambulatory care settings
 - a. Diabetes mellitus
 - b. Hypertension

- c. Dyslipidemia
 - d. Osteoporosis
 - e. Thromboembolic diseases (DVT/PE)
3. Discuss the pathophysiology, management, and monitoring of any additional disease states as directed by the preceptor
 4. Formulate a concise and evidence-based patient-centered care plan in collaboration with other health care professionals, patients, and/or their caregivers, which considers the patient's health literacy, culture, and psychosocial factors.
 5. Communicate with other health care professionals about the appropriateness of a patient's pharmacotherapy with clarity and accuracy (drug, dosing, dosage forms, routes of administration, delivery systems)
 6. Communicate with patients, families, and other health professionals in a responsive and responsible manner that supports a team approach to the maintenance of health and the treatment of disease
 7. Prepare an accurate, concise, and organized written patient care plan
 8. Implement, monitor, evaluate, and adjust comprehensive medication management plans with accuracy and timeliness
 9. Demonstrate skills in providing drug information and therapeutic recommendations to physicians and nurses within ambulatory care units in a professional manner

Emergency Medicine Rotation

Emergency medicine rotation is a five-week elective rotation in the second year of the residency program.

Goals:

To consider the potential impact of the presence of a clinical pharmacy consultative service within an emergency services area. Pharmacokinetics and toxicological consultative activities and the provision of instructions for health care personnel on therapeutic/pharmacological intervention are examples often cited as unique opportunities for clinical pharmacists who want to expand their practice in critical care areas including emergency services to pursue.

Objectives:

At the completion of the rotation, the resident should be able to:



1. Demonstrate skill in determining the relevant history and use of ancillary services (e.g., toxicology laboratory, etc.) to assess and manage emergencies
2. Describe clinical research methodologies in emergency medicine that have specific applications to clinical pharmacy practitioners
3. Demonstrate knowledge of the common therapeutic agents used in the emergency department
4. General Pediatric Rotation

General pediatric rotation is a five-week elective rotation in the second year of the residency program.

Goals:

To provide students with experience in pharmacotherapeutic management of pediatric patients with common acute and chronic medical illnesses.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Discuss the pathophysiology, management, and monitoring of the following disease states and symptoms in children, and apply this knowledge to the pharmaceutical care of patients encountered in rotations, including:
 - a. Reactive airway disease (asthma, bronchiolitis, croup)
 - b. Respiratory distress syndrome
 - c. Cystic fibrosis
 - d. Diabetes
 - e. Seizure disorder/febrile seizures
 - f. Pediatric infectious diseases (meningitis, osteomyelitis, urinary tract infections, respiratory tract infections, otitis media)
 - g. Gastroesophageal reflux and related disorders
 - h. Anemia
 - i. Fever
 - j. Vomiting/diarrhea/dehydration
 - k. Pain management
2. Discuss drug administration issues and techniques in different age groups and apply this knowledge to the pharmaceutical care of specific patients

3. Work with a multidisciplinary team in an area of pediatric medicine and develop the necessary skills to become a valued team member
4. Develop basic knowledge of the various diagnostic and monitoring techniques utilized in pediatric and neonatal patients

Hematology Rotation

Hematology rotation is a five-week elective rotation in the second year of the residency program.

Goals:

To learn about hematological disorders, cancer diagnosis and management, and management and diagnosis of bleeding and coagulation disorders.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Discuss the clinical findings, diagnosis, course, complications, prognosis, and management of benign and malignant hematologic disorders encountered during rotations and apply this knowledge to the pharmaceutical care of patients. Minimally, the resident should become familiar with:
 - a. Acute leukemia (AML, ALL)
 - b. Chronic leukemia (CML, CLL)
 - c. Aplastic anemia
 - d. Multiple myeloma
 - e. Burkitt's lymphoma
 - f. Other neoplastic and hematologic disease states
2. Discuss the pathophysiology, prevention, management, and monitoring of the following complications of cancer and/or its therapy, and apply this knowledge to the pharmaceutical care of patients encountered during rotations:
 - a. Nausea and vomiting
 - b. Mucositis
 - c. Febrile neutropenia
 - d. Infections
 - e. Tumor lysis syndrome
 - f. Neutropenia, anemia, thrombocytopenia
 - g. Pain



3. Monitor and interpret lab results, as indicated by the patient's disease state and antineoplastic/pharmacological therapy
4. Optimize the patient's supportive care regimen
5. Demonstrate competency in monitoring drug therapy and fluid electrolyte therapy
6. Provide accurate and effective medication counseling to patients and obtain a medication history from patients
7. Critically evaluate the appropriateness of patients' antimicrobial therapy, supportive therapy, and recommend appropriate changes to optimize therapy

Nephrology Rotation

Nephrology rotation is a five-week elective rotation in the second year of the residency program.

Goals:

To improve the residents' understanding of the subspecialty of nephrology and enable them to safely manage patients with nephrology disorders and complications.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Discuss the pathophysiology, microbiology, management, and monitoring of the following renal diseases and apply this knowledge to the patients encountered during rotations:
 - a. Acute renal failure
 - b. Chronic renal failure
 - c. Electrolyte imbalance
 - d. Anemia of chronic disease
 - e. Diabetes mellitus
 - f. Hypertension
 - g. Nephrotic syndrome
2. Develop basic knowledge of various diagnostic tests used in the management of renal disease
3. Develop the skills of evaluating patient data to identify drug therapy-related problems, promote optimal drug therapy, and develop drug therapy recommendations

4. Confidently and effectively communicate with patients and health care professionals about disease states and drug therapy
5. Develop teaching skills by presenting formal and informal lectures on selected topics in renal medicine.
6. Develop knowledge of the role of the clinical pharmacist in the care of patients with renal disease

Oncology Rotation

Oncology rotation is a five-week elective rotation in the second year of the residency program.

Goals:

To demonstrate an understanding the fundamentals of pharmacotherapy in patients with different types of oncology disorders

Objectives:

At the completion of the rotation, the resident should be able to:

7. Discuss the clinical findings, diagnosis, course, complications, prognosis, and management of cancers encountered during rotations and apply this knowledge to the pharmaceutical care of patients. Minimally, the resident will become familiar with
 - a. Osteogenic sarcoma
 - b. Ewing sarcoma
 - c. Wilms' tumor
 - d. Lung cancer
 - e. Multiple myeloma
 - f. Breast cancer
 - g. Colon cancer
 - h. Leukemia
 - i. Hodgkin's and non-Hodgkin's lymphoma
 - j. Other neoplastic and hematologic disease states
1. Discuss the pathophysiology, prevention, management, and monitoring of the following complications of cancer and/or its therapy, and apply this knowledge to the pharmaceutical care of patients encountered during rotations:



- a. Nausea and vomiting
 - b. Stomatitis/esophagitis
 - c. Infection
 - d. Hypercalcemia
 - e. Hyperuricemia
 - f. Neutropenia, anemia, thrombocytopenia
 - g. Pain
 - h. Graft vs. host disease
 - i. Extravasation
2. Monitor and interpret lab results, as indicated by the patient's disease state and antineoplastic/pharmacological therapy
 3. Recommend changes in patients' analgesic regimens to optimize pain control
 4. Provide accurate and effective medication counseling to patients and obtain a medication history from them
 5. Evaluate the appropriateness of patients' pharmacological therapy and recommend appropriate changes to optimize therapy

Pain Management Rotation

Pain management rotation is a five-week elective rotation in the second year of the residency program.

Goals:

To demonstrate an understanding of the fundamentals of caring for patients with acute, chronic, and palliative pain.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Discuss the pathophysiology, management, and monitoring of the different pain classes and apply this knowledge to the pharmaceutical care of patients encountered during rotations.
2. Discuss drug administration issues and techniques in different age groups and apply this knowledge to the pharmaceutical care of specific patients
3. Work with a multidisciplinary team in a pain clinic and develop the necessary skills to become a valued team member

4. Develop a basic understanding of the various approaches of pain assessment and monitoring techniques utilized in acute and chronic pain patients
5. Recommend changes in patient's analgesic regimens to optimize pain control
6. Discuss different approaches to treat patients with opioid tolerance, dependence, and addiction
7. Recognize the law, regulations, and restrictions of the narcotic/controlled medications with regard to prescribing issues

Pediatric Critical Care Rotation

Pediatric critical care rotation is a five-week elective rotation in the second year of the residency program.

Goals:

To equip residents with a pathophysiologically-based understanding of common life-threatening pediatric conditions and to acquire the skills and knowledge necessary to evaluate, stabilize, and appropriately manage critically ill patients. Residents should demonstrate knowledge of established and evolving biomedical, clinical, and social sciences and apply such knowledge to patient care.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Demonstrate competency and efficiency in reviewing the different sections of a patient chart
2. Comprehend the pediatric pharmacotherapy principles and apply this knowledge to the pharmaceutical care of patients
3. Discuss the pathophysiology and pharmacotherapy of the most common disease states seen in pediatric critical care units:
 - a. Sepsis and septic shock in pediatrics
 - b. Cardiac arrest
 - c. Acute respiratory distress
 - d. Sedation and analgesia
 - e. Pneumonia
 - f. Acute renal failure
 - g. Acid-base disorders
 - h. Burn



- i. Status epilepticus
 - j. Diabetic ketoacidosis
 - k. Status asthmaticus
4. Develop a basic knowledge of the various diagnostic and monitoring techniques utilized in pediatric patients
 5. Evaluate the appropriateness of patients' pharmacological therapy and recommend appropriate changes to optimize therapy
 6. Demonstrate competency in therapeutic drug monitoring
 7. Demonstrate skill in providing drug information and therapeutic recommendations to physicians and nurses in a professional manner
 8. Communicate effectively and professionally with health care professionals
 9. Define the role of a clinical pharmacist within a pediatric ICU

Pediatric Oncology Rotation

Pediatric oncology rotation is a five-week elective rotation in the second year of the residency program.

Goals:

To demonstrate an understanding of the fundamentals of pharmacotherapy in pediatric patients with different types of hematology and oncology disorders

Objectives:

At the completion of the rotation, the resident should be able to:

1. Develop clinical competence in understanding the pathophysiology of different pediatric oncology malignancies:
 - a. Leukemia (Acute lymphocytic leukemia (ALL), acute promyelocytic leukemia (APL), Chronic myeloid leukemia (CML)CLL, Myelodysplastic syndrome (MDS)
 - b. Solid tumors (osteosarcoma, Wilms' tumors, Ewing sarcoma, rhabdomyosarcoma, neuroblastoma, hepatoblastoma, etc.)
 - c. Neurological malignancies (baby brain tumors, medulloblastoma, retinoblastoma, high-grade and low-grade astrocytoma)
 - d. Stem cell transplantation

2. Develop competence in discussing the basic principles and mechanisms of action of chemotherapeutic agents and targeted therapies, describe the major acute and long-term side effects of common chemotherapeutic agents, and suggest a proper management plan
3. Develop knowledge of oncology malignancies (tumor lysis syndrome, hemorrhagic cystitis, veno-occlusive disease)
4. Develop competence in interpreting the results of common laboratory tests; normal values, sensitivity/specificity, and laboratory errors
5. Refine the resident pharmaceutical care skills necessary to monitor the safety and efficacy of drug therapy associated with pediatric oncology patients
6. Refine the resident pharmaceutical care skills necessary to perform dose modifications of chemotherapeutic regimens in patients with renal insufficiency, hepatic insufficiency, and severe bone marrow suppression
7. Develop the competence necessary to manage chemotherapy-induced neutropenia and to develop a full knowledge of antimicrobial, antifungal, and antiviral drug therapies for treatment and prophylaxis
8. Refine the resident pharmaceutical care skills necessary to carry out pharmacokinetics-based consultations
9. Develop the competence and ability required to contribute effectively to patient care rounds, and be able to provide proper drug information to physicians, patients, and parents
10. Develop competence and ability to use primary literature and reference sources to provide answers to different pharmacotherapy-related questions

Solid Organ Transplant Rotation

Solid organ transplant rotation is a five-week elective rotation in the second year of the residency program.

Goals:

In collaboration with the health care team, residents will be able to provide safe and effective comprehensive medication management to a diverse range of solid organ transplant patients, including those with multiple comorbidities, high-risk medication regimens, and multiple medications following a consistent patient care process.

Objectives:

At the completion of rotations, the resident should be able to:



1. Demonstrate competency and efficiency in reviewing the different sections of a patient chart
2. Describe the key components of diagnostic physical examinations and relate the influence of drug therapy on this process
3. Identify pertinent diagnostic procedures that apply to the specific transplant setting
4. Demonstrate competency in interpreting the results of common laboratory tests: normal values, sensitivity/specificity, and laboratory errors
5. Identify and gather subjective and objective data necessary to monitor therapy for efficacy and safety
6. Formulate, on a prospective basis, a therapeutic management plan for chronic diseases in organ transplant recipients, such as diabetes, hypertension, hyperlipidemia, and ischemic heart disease, including drug and non-drug therapies
7. Formulate, on a prospective basis, a therapeutic management plan for infectious disease complications post organ transplantation, which includes bacterial, fungal, parasitic, and viral infections
8. Formulate, on a prospective basis, a therapeutic management plan for non-infectious complications of organ transplantation, such as osteoporosis, polycythemia, post-transplant lymphoproliferative diseases (PTLD), nephrotoxicity, neurotoxicity, and acute coronary syndrome
9. Use primary literature and reference sources to effectively answer questions
10. Prioritize daily workload based on information obtained during rounds

Surgery Rotation

Surgery rotation is a five-week elective rotation in the second year of the residency program.

Goals:

1. To familiarize residents with the provision of clinical pharmacy services to surgery patients.
2. To be responsible for providing accurate and timely drug information to surgeons and other health care professionals related to surgery services.
3. To gain a general understanding of the medications involved in surgery with emphasis on antibiotic therapy, nutritional support, and pain management.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Discuss the pathophysiology and treatment (pharmacotherapeutic and non-pharmacotherapeutic) of disease states commonly encountered in non-critically ill adult surgical patients (non-cardiac), including the following:
 - a. Colorectal diseases requiring surgical treatment, including malignant and non-malignant diseases, such as inflammatory bowel diseases
 - b. Peritoneal carcinomatosis from variable primary tumor origins
 - c. Gastric disease, including gastric malignancies and perforations
 - d. Severe malnutrition state requiring parenteral nutrition (PN)
 - e. Intra-abdominal infections
 - f. Postoperative nausea and vomiting
 - g. Postoperative delirium
 - h. Surgical complications, including venous thromboembolism, infections, and fistulas
2. Develop basic knowledge of various diagnostic and assessment techniques used in the management of surgical patients and acquire exposure to professional surgical terminology
3. Develop skills in evaluating surgical patients' medications to promote pharmaceutical care through optimization of drug therapy, identify drug-therapy-related problems, and develop rational drug therapy recommendations
4. Assess surgical patients' nutritional status, understand the need for artificial feeding, and identify candidates for PN support
5. Use appropriate available pathways, clinical practice guidelines, and disease management protocols for the delivery of pharmaceutical care
6. Integrate with members of the health care team and establish interdisciplinary relationships
7. Provide evidence-based and timely responses to drug information requests
8. Demonstrate competency in monitoring drug therapy, electrolytes, PN, and intravenous fluids

Parenteral Nutrition Rotation

Parenteral nutrition rotation is a five-week elective rotation in the second year of the residency program.



Goals:

To provide residents with a general understanding of issues related to specialized nutrition support and to allow the opportunity to develop skills in patient assessment, patient monitoring, parenteral nutrition formulation, and formula adjustment. Residents should also increase their proficiency in communication skills to facilitate interactions with other health care professionals and patients.

Objectives:

At the completion of the rotation, the resident should be able to:

1. Develop a general overview of parenteral nutrition knowledge
2. Demonstrate knowledge and perform a nutritional assessment on patients with medical problems
3. Develop knowledge in fluid requirements by age/disease status
4. Gain the required skills to comprehend the impact of electrolyte imbalances and manage them
5. Define the required responsibility for maintenance or restoration of optimal nutritional support, designing and modifying management according to patient needs
6. Demonstrate skills in interactions with nurses, physicians, and nutritional support specialists in a professional manner
7. Recommend an appropriate nutritional regimen for patients based on their unique clinical status and recommend appropriate modifications to an existing regimen
8. Monitor drug therapy prospectively for potential drug-drug, drug-laboratory test, drug-nutrient and drug-disease state interactions, and recommend modifications in drug therapy, when appropriate, to avoid undesirable interactions
9. List common medications that cause electrolyte abnormalities and the mechanism behind those drugs/ lab interactions
10. Discuss the following:
 - a. Benefits of enteral vs. parenteral nutrition
 - b. Indications/contraindications for parenteral and enteral nutrition
 - c. Monitoring nutrition related laboratory values
 - d. Electrolyte management of the parenterally and enterally fed patient
 - e. Assessing nutritional status
 - f. Nutrient substrates and physical characteristics of tube feeding products

- g. Drug/tube feeding interactions
- h. Drug/parenteral nutrition interactions
- i. Immune-enhancing enteral nutrition

Appendix-B: Common Topics/Disease States Encounters

Keep a tally of the list below. The encounter types can be identified as PE or TD. Once you feel completely comfortable dealing with a specific disease or condition on the list, place a check mark next to the encounter date, and you may quit tallying that specific condition.

Encounter Type: Patient Encounter (PE)

Encounter Type: Topic discussion (TD)

Encounter Type: Literature Review (LR)

First Year

Common Conditions/Disease States			
Condition/Disease	Encounter Type	Encounter Date	Comments
Ambulatory Rotation			
ASHP Guidelines on Pharmacist-Conducted Patient Education and Counseling			
ASHP Technical Assistance Bulletin on Compounding Non-sterile Products in Pharmacies			
ASHP Safe and Effective Extemporaneous compounding			
ASHP Minimum Standard for Pharmaceutical Services in Ambulatory Care			
Narcotic/Controlled medications section: Regulations and Controls for Narcotic Drugs and Psychotropic Substances in Saudi Arabia			
Sterile Preparation Rotation			
ASHP Guidelines on Quality Assurance for Pharmacy-Prepared Sterile Products			
ASHP Technical Assistance Bulletin on Handling Cytotoxic and Hazardous Drugs			
ASHP Technical Assistance Bulletin on Pharmacy-Prepared Ophthalmic Products			



Safe Practices for Parenteral Nutrition Formulations			
Inpatient I & II Rotation			
ASHP Technical Assistance Bulletin on Single Unit and Unit Dose Packages of Drugs			
ASHP Technical Assistance Bulletin on Repackaging Oral Solids and Liquids in Single Unit and Unit Dose Package			
ASHP Technical Assistance Bulletin on Compounding Non-sterile Products in Pharmacies			
Administration Rotation			
ASHP Technical Assistance Bulletin on Hospital Drug Distribution and Control			
Drug Information Rotation			
ASHP Statement on the Formulary System			
ASHP Guidelines on Formulary System Management			
ASHP Guidelines on Preventing Medication Errors in Hospitals			
ASHP Statement on Pharmaceutical Care			
ASHP Guidelines on a Standardized Method for Pharmaceutical Care			
ASHP Statement on the Pharmacist's Role in Infection Control			
Introduction to Clinical Rotation and Internal Medicine			
S.O.A.P. writing and patient assessment			
Diagnostic physical examinations			
Interpreting the results of common laboratory tests			
Electrolyte imbalance (sodium, potassium, magnesium, phosphate and calcium)			
Acid base imbalance			
Heart circulation and ECG readings			
Anemia disorders			
Thyroid disorder			
Hypertension			
Diabetes mellitus			
Dyslipidemia			

Antithrombotic therapy (antiplatelet, anticoagulants, fibrinolysis)			
Kidney disease (acute kidney impairment and chronic kidney impairment)			
Pharmacokinetics (vancomycin and aminoglycoside dose adjustment)			
GI prophylaxis			
Venous Thromboembolism (VTE) prophylaxis			
Asthma and COPD			
Asthma			
Deep vein thrombosis			
Depression			
Osteoarthritis			
Peptic ulcer disease			
Osteoporosis			
Pulmonary embolism			
Rheumatoid arthritis			
Stroke			

Second Year

Common Conditions/Disease States			
Condition/Disease	Encounter Type	Encounter Date	Comments
Diseases or conditions that frequently underlie and the indication for:			
Infectious disease Rotation			
Pneumonia (hospital and community acquired)			
Meningitis			
Urinary tract infection			
Osteomyelitis			
Pelvic infection			
Sexually transmitted disease, HIV			
Intra-abdominal infection			
Cellulitis			



Septic shock			
Endocarditis			
Fungal/viral infection			
Parasitic infection			
Tuberculosis and infection in immunocompromised hosts			
Critical Care Rotation			
Head injury /intracranial bleeding			
Seizures			
Meningitis			
Sepsis			
Respiratory failure			
Adult respiratory distress syndrome			
Renal failure (acute and chronic)			
Diabetic ketoacidosis			
Hypertensive emergencies/urgencies			
Shock syndrome and complications			
Trauma			
Drug overdose			
Cardiology Rotation			
Atrial and ventricular arrhythmias			
Coronary artery disease/angina			
Congestive heart failure			
Acute myocardial infarction			
Cardiogenic shock			
Cardiac arrest/cardiopulmonary resuscitation			
Nephrology Rotation			
Acute renal failure			
Chronic renal failure			
Electrolyte imbalance			
Chronic disease anemia			
Diabetes mellitus			
Hypertension			
Nephrotic syndrome			
Total Parenteral Nutrition			
Benefits of enteral over parenteral nutrition			
Indications/contraindications for parenteral and enteral nutrition			
Monitoring nutrition related laboratory values			
Electrolyte management of the parenterally and enterally fed patient			

Assessing nutritional status			
Nutrient substrates and physical characteristics of tube feeding products			
Drug/tube feeding interactions			
Drug/parenteral nutrition interactions			
Immune-enhancing enteral nutrition			
Oncology Rotation			
Osteogenic sarcoma			
Ewing sarcoma			
Wilms' tumor			
Lung cancer			
Multiple myeloma			
Breast cancer			
Colon cancer			
Leukemia			
Hodgkin's and non-Hodgkin's lymphoma			
Other neoplastic and hematologic disease states			
Nausea and vomiting			
Stomatitis /esophagitis			
Infection			
Hypercalcemia			
Hyperuricemia			
Neutropenia, anemia, thrombocytopenia			
Pain			
Graft vs. host disease			
Extravasation			
Pediatrics Rotation			
Reactive airway disease (asthma, bronchiolitis, croup)			
Respiratory distress syndrome			
Cystic fibrosis			
Diabetes			
Seizure disorder/febrile seizures			
Pediatric infectious diseases (meningitis, osteomyelitis, urinary tract infections, respiratory tract infections, otitis media)			
Gastroesophageal reflux and related disorders			
Anemia			
Fever			
Vomiting/diarrhea/dehydration			
Pain management			



Appendix-C: Glossary

Glossary

Glossary	
Blueprint	Description correlating educational objectives with assessment contents. For example, the test blueprint defines the proportion of test questions allocated to each learning domain and/or content.
Competency	Ability to function within a defined professional role that implies entrusting a trainee with the required knowledge, skills, and attitude needed to practice unsupervised. after graduation of the program
Specialty Core Content (skills, knowledge, and professional attitude)	A specific knowledge or skill or professional attitude that is specific and integral to the given specialty.
Formative Assessment	An assessment that is used to inform the trainer and learner of what has been taught and learned, respectively, for the purpose of improving learning. Typically, the results of formative assessment are communicated through feedback to the learner. Formative assessments are not intended primarily to make judgments or decisions (although this can be as a secondary gain).
Mastery	Exceeding the minimum level of competency to the proficient level of performance indicating rich experience with possession of great knowledge, skills, and attitude.
Portfolio	A collection of evidence of progression toward competency, which may include both constructed components (defined by mandatory continuous assessment tools in curriculum) and unconstructed components (selected by the learner).
Summative Assessment	An assessment that describes the composite performance of the development of a learner at a particular point in time and is used to inform judgment and make decisions about the level of learning and certification.
Universal Topic	Knowledge, skills, or professional behavior that are not specific to the given specialty but universal for the general practice of a given healthcare profession.