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Saudi Commission for Health Specialties

Saudi Pediatric Infectious Diseases Fellowship

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بسم الله الرحمن الرحيم

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The Pediatric Infectious Diseases Fellowship Program curriculum was initiated by previous infectious diseases scientific committee groups and was recently prepared and updated by the current Pediatric Infectious Diseases Scientific Group.

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Any amendment to this document should be endorsed by the Specialty Scientific Council and approved by the Central Training Committee. Unless a different implementation date is mentioned, this document shall be considered effective from the date the updated electronic version of this curriculum was published on the commission's website.

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Curriculum Scientific Group

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INTRODUCTION

1. Context of Practice

The Kingdom of Saudi Arabia is a rapidly developing country that is making significant improvements in health services. Disorders caused by various infectious agents are one of the major causes of morbidity and mortality in Saudi children. Furthermore, the field of infectious diseases is a rapidly progressing subspecialty. Over the past two decades, there has been marked progress has been made in the development of diagnostic, preventive, and therapeutic modalities. Furthermore, the list of newly discovered infectious agents, and rapidly changing disease syndromes, as well and newly introduced antimicrobial agents has been expanded.

Therefore, there is a growing demand for a national training program to provide pediatricians with the necessary training, in line with the Saudi Board in Pediatric Infectious Diseases. The program should help trainees acquire competence in the management of various infectious disease problems in infants, children, and adolescents, and achieve a comprehensive understanding of the related social, economic, and environmental aspects.

Pediatric fellowship program graduates should be proficient in direct and consultative clinical care, teaching, and/or a selected area of research. As a differentiation of interests and activities is expected and encouraged, after the completion of the program, fellows will continue to cultivate and follow their area of interest in pediatric infectious diseases.

Training will also include the development of skills as an educator, including expertise in presentation skills, curriculum development, and evaluation. In addition, fellows will receive foundational training in research design, scientific writing, and literature reviews.

2. Goal and Responsibility of Curriculum Implementation

The program consists of two years of full-time structured supervised training in pediatric infectious diseases, including admission into an approved joint program with rotations in hospitals accredited to train individuals in pediatric infectious diseases.

The fellowship program offers an effective teaching curriculum for fellows to acquire the appropriate medical expertise and decision-making skills to function as independent pediatric infectious disease consultants. This entails teaching in areas pertinent to the acquisition of medical expertise and clinical decision-making skills, including clinical skills and bedside teaching. The academic program also provides organized teaching in the basic and clinical sciences relevant to pediatric infectious diseases. An organized curriculum ensures that all major topics are covered over the course of a fellow's time in the program. This includes teaching with a patient-centered focus and it may include journal clubs, research conferences, and seminars, in addition to the use of an academic half-day or its equivalent.

Fellows should be provided with adequate protected time to attend the structured sessions, and attendance should be taken.

The program offers a broad range of clinical experiences. In addition to consultations in general and subspecialty pediatric services, the program also offers consultations in surgical subspecialties, oncology services, pediatric and neonatal intensive care units, and various transplantation programs. Experience with adult infectious diseases is provided through rotations in an adult infectious disease training program or an organized adult infectious disease service supervised by a qualified adult infectious disease specialist.

Trainee fellows will have opportunities to assume responsibility for patient care over a sufficiently long period to observe the natural history of the disease and the benefits and complications of therapy.

Organized outpatient clinics are available for the investigation and treatment of infections not requiring hospitalization, as well as for follow-ups of inpatients after discharge from the hospital.

3. What is New in This Edition?

A-Research Rotation and Evaluation Form Template: Fellows will learn how to develop a hypothesis based on a thorough understanding of existing data, develop specific aims to test that hypothesis, understand study design, develop an appropriate protocol to accomplish the specific aims, analyze the data, and develop a manuscript to communicate research findings by attending research courses.

Updates to the Pediatric Infectious Diseases program with the addition of research courses (mandatory).

Updates to Pediatric Infectious Diseases Program with the addition of research rotation evaluation form template in One 45 to promote the objectives of the rotation for the benefit of the trainees. (Please refer to Appendix J.)

B-Pediatric Infectious Diseases Antimicrobial Stewardship as Mandatory Rotation (4 weeks)

Antimicrobial stewardship is a program that promotes the proper use of antimicrobials and, antibiotics, improves patient outcomes, reduces microbial resistance, and decreases the spread of infections caused by multidrug-resistant organisms.

Objectives:

1. Participate in the antimicrobial stewardship program rotation.
2. Actively participate in stewardship activities while on service (e.g., cover pager on weekdays, enter stewardship notes, manage restricted antimicrobials for consulted patients, and participate in discussions on stewardship issues at conferences).
3. Cover the antimicrobial stewardship pager and manage issues (e.g., approval requests, positive blood culture alerts, drug level alerts, or multidrug-resistant organism alerts).
4. Attend weekly antimicrobial stewardship team meetings (pediatric and house-wide) and any other relevant meetings.
5. Join the antimicrobial subcommittee and attend meetings.
6. Participate in the development of treatment guidelines.
7. Develop a research project relevant to antimicrobial stewardship.
8. Attend at least one antimicrobial stewardship conference during the fellowship.

C-Volunteering at Pediatric Infectious Diseases Mass Gathering Medicine (2 weeks)

Mass gatherings in the Hajj and Umrah are associated with unique health risks, such as transmission of infectious diseases, particularly respiratory and gastrointestinal diseases (diarrheal disease); food poisoning; hemorrhagic fevers; meningococcal diseases; cardiovascular disease; heat stroke; and trauma.

The Hajj presents a unique challenge that affects international public health. For this reason, we would like to collaborate with the mass gathering medicine center by sending pediatric infectious disease fellows as volunteers.

A maximum of two weeks during the Hajj period in Mecca as part of the elective rotation.

Starting in 2021, the expected number of rotations is one fellow per year. This rotation was designed to provide the Saudi healthcare system with qualified infectious disease professionals to cope with continuously hosting such mass gathering events. The remaining two weeks of rotation can be spent as chosen by the fellows in the field engaged in other activities such as research.

Objectives: To improve students' knowledge and skills in the following aspects:

– Potential risk of disease transmission.

– Involvement in vaccination campaigns and management of health hazards.
– Exposure to various infectious disease cases during the Al Hajj period (diagnosis and management).
– Infection control and preventive medicine during the Al Hajj period.
– Risk assessment and management.
– Surveillance and alert systems (communicable disease surveillance).
– Outbreak alerts and responses.

D-Infection Control and Prevention Rotation Checklist and Evaluation Form Template

To ensure that the fellows met the objectives of infection prevention and control rotation after each rotation. Please refer to Appendix B.

Updates to Pediatric Infectious Diseases Program with the addition of Infection Control and Prevention rotation evaluation form template in One 45 to promote the objectives of the rotation for the benefit of the trainees. (Please refer to Appendix K.)

E-Microbiology Rotation Checklist and Microbiology Evaluation Form Template

To ensure that the fellows met the objectives of microbiological rotation after each rotation. Please refer to Appendix D.

Updates to Pediatric Infectious Diseases Program with the addition of the Microbiology Rotation Evaluation Form Template in One 45 to promote the objectives of the rotation for the benefit of the trainees. (Please refer to Appendix L.)

F-Universal Topics

These are interdisciplinary topics of utmost importance to the trainee. These topics will be didactic in nature, with a focus on the practical aspects of care. Please see the following link for more information:

https://lms.scfhs.org.sa/course/index.php?categoryid=9%3EUniversal%20Topics

Assessment: The topics will be covered in a modular manner. Each learning unit ends with an online formative assessment. After all the topics are completed, there will be a combined summative assessment in the form of a context-rich MCQ. All trainees must attain minimum competency in summative assessments. (Please refer to Appendix A.)

G-Several tables have been added for ease of information retrieval.

4. Policies and Procedures

The pediatric infectious disease fellowship program is aimed at producing competent specialists who can manage infectious disease cases based on excellent medical evidence. To achieve this, the program is designed to educate candidates in the relevant fields of the specialty. This is not a didactic program but is rather meant to be a self-training program with expert guidance. Candidates need to build experience based on hands-on practice and self-education using different available teaching resources. The following are the general orientation points to help with the rotations:

1. Most of the work of infectious disease fellows is based on consultations with other services. Therefore, when a consultation request is received, the fellow should read the consultation and clarify the question to be answered. To do so, the case should be reviewed thoroughly from all aspects, not only the infectious disease aspect. As the patient should be fully examined, verbal consultation should be avoided as much as possible. After the clinical evaluation, the findings should be documented in the consultation sheet, and a plan of management including a problem list, differential diagnosis, and suggested workup and intervention should be outlined. The consultation question should be answered clearly, and if references are available, they should be stated.
2. The fellow should try to briefly review the online services to reach the consultation answer before discussing the case with their consultant.

3. Management plans should always be based on the most recent evidence and should be patient- rather than disease-centered.
4. The suggested management plan should be conveyed to the patient's MRP or their designee and should be discussed with the patient using age-appropriate language. Daily follow-up of the patient is required until the infectious disease is resolved or the chronic care plan is deemed clear.
5. The fellow is responsible for following up on all pending laboratory investigations and making any required changes based on the results, including antibiotic drug levels.
6. The fellow is responsible for communicating with microbiology, infection control, and other relevant services if their assistance is needed.
7. Patients being followed by the Pediatric Infectious Disease Service are to be included in daily rounds, and notes on them are needed. Exceptions are those patients with chronic problems who that team has agreed do not need daily rounds.
8. Weekend rounds should be performed by a fellow covering the call for that weekend. The team determines which patients should be seen prior to the start of the weekend. Weekend rounds are to be completed every morning to ensure that the plan is set for the consulting service.
9. The pediatric infectious disease log should be filled out daily by the on-service fellow.
10. Each fellow should try to create a database of interesting and educational cases that could be potential case presentations, which all could benefit from, to be included in the portfolio.
11. The fellow should maintain a library of interesting pictures of patients, slides, culture media, and other relevant data in the portfolio after obtaining consent from the patients/families, as guided by local regulations and practice.
12. The fellow should aim to fulfill the outlined objectives during their training and regularly review where they stand with the program director or mentor.

General Objectives

The goal of the Infectious Diseases Program is to train pediatricians to:

1. Become competent in the management of infections in infants and children.
2. Acquire adequate basic science and clinical knowledge to interpret data from the clinical microbiology laboratory.
3. Become self-disciplined, self-dependent life-long learners who serve as consultants for other services and provide an educational environment that will promote a high standard of healthcare.
4. Perform research and emphasize an evidence-based approach to clinical problems.
5. Reach an internationally acceptable standard with an appropriate attitude and medical ethics.
6. Understand the basics of infection control, epidemiology, and public health.
7. Gain knowledge of the pharmacology of antimicrobial agents used in pediatric patients.
8. Understand the basics of human defense against infections.

5. Abbreviations Used in This Document

SCFHS: Saudi Commission for Health Specialty.

ASP: Antimicrobial Stewardship Medicine.

MGM: mass gathering medicine.

HH: hand hygiene.

HAI: healthcare-associated infection.

MRSA: Methicillin-resistant Staphylococcus aureus.

CLABSI: central line-associated bloodstream infections.

VRE: Vancomycin-resistant enterococci.

IPass: illness severity, patient summary, action list, situational awareness, and synthesis by the receiver.

SBAR: situation, background, assessment, and recommendation.

CDC: Centers for Disease Control and Prevention.

BSI: blood stream infection.

VAP: ventilator-associated infection.

IP&C: infection prevention and control.

SSI: surgical site infection.

BMT: bone marrow transplant.

Non-BMT: non-bone marrow transplant.

PROGRAM STRUCTURE

1. Program Entry Requirements

For admission into the Pediatric Infectious Diseases program, an individual must:

Possess a certificate from the Saudi Board of Pediatrics or an equivalent recognized degree or successfully complete the written component of the Final Saudi Board of Pediatrics.

1. Pass the interview conducted by the regional committee.
2. Provide three letters of recommendation from consultants with whom the candidate has recently worked for a minimum period of six months.
3. Provide written permission from the sponsoring institution of the candidate allowing them to participate on a full-time basis for the entire duration of the program.
4. Register for the program at the Saudi Council for Health Specialties.

I. TRAINING CENTER REQUIREMENTS

For any hospital to be accredited to participate in the Pediatric Infectious Diseases training program, the following requirements must be fulfilled:

1. Full accreditation for pediatrics training by the Saudi Council for Health Specialties.
2. Qualified staff:
   a) Program Director
      The fellowship program director should be a pediatric infectious disease consultant certified by the Saudi Board of Pediatrics or its equivalent in general pediatrics. Additionally, the director should preferably be certified or be eligible for certification by an internationally-recognized scientific body in the field of pediatric infectious diseases and have a minimum of three years of post-training experience and a background in academia with an understanding of research methodology.

   b) A minimum of two full-time pediatric infectious disease consultants (including a program director) with at least two years of fellowship training in an accredited infectious disease program and at least three years of post- training experience.

3. Facilities and Resources.
   The following are essential for the training program:

   a) An adequate number of consultations involving immunocompetent and immunocompromised children to ensure adequate exposure to infectious disease problems in various hosts. Records of these consultations should be maintained.
   b) -In-patient and intensive care (including neonatal intensive care). and ambulatory care facilities.
   c) Fully equipped, high-standard, and staffed microbiological laboratory facilities with the ability to perform diagnostic bacteriology, parasitology, virology, mycology, and specialized serological tests. This is in addition to a facility capable of performing diagnostic immunological and molecular tests.
   d) Infection control services.
   e) Supportive services (e.g., diagnostic and interventional radiology and pathology laboratories).
   f) Library facilities with ready access to all major infectious disease journals and literature search facilities.

2. Program Durations

The Pediatric Infectious Diseases program is a two-year program in which the trainee rotates through various rotations. These rotations included clinical services (12 months plus one month on the adult service), microbiology (three months), Antimicrobial Stewardship program rotation (one month), infection control (two months), clinical immunology (one month), research (one month), and elective

rotation (one month). The candidate is eligible for four weeks annual vacation.

3. Program Rotations

1. First Year

During the first year, the fellow is expected to:

a) Acquire a broad overview of the basic sciences of infectious diseases (e.g., microbiology, immunology, pathogenesis, and pharmacology).
b) Gain adequate knowledge of common pediatric infectious disease problems.
c) Have the following supervised rotations (mandatory):

Consultation Service (minimum)	7 months
General Microbiology	4 weeks
Parasitology Virology-Molecular, Serology	2 weeks
Tuberculosis/Mycology	2 weeks

The rest of the first year will be left for the program director to assign the fellow any approved rotation of the program.

	Mandatory
Rotations	F1
Consultation Service	7 months
Microbiology	2 months
Immunology	1 month
Infection control	1 month
	Annual leave
Annual leave	4 weeks

2. Second Year

During the second year, the fellow is expected to:

a) Acquire a high level of understanding of the basic sciences and their applications in the management of infectious disease problems.
b) Learn an approach to investigate and manage complicated and rare infectious diseases.

During this year, the trainee will have a month of training in a microbiology laboratory. The fellow will also complete the remaining rotations that were not completed during the first year. Elective rotation may be spent in tropical medicine or other areas of infectious diseases deemed acceptable by the program. Covering the Hajj duty would also qualify as part of the elective experience.

	Mandatory
Rotations	F2
Consultation in pediatric infectious diseases service	3 months
Consultation service with pediatric immunocompromised patients	2 months
Consultation in adult infectious diseases service	1 month
Microbiology	1 month

Antimicrobial Stewardship Program	1 month
Infection control	1 month
Research	1 month
	Elective
Elective	**1 month**
	Annual leave
Annual leave	4 weeks

Night Calls, Vacation, and Holidays

a) Trainees are required to take calls for the Infectious Disease Service for a maximum of two weeks per month, including two weekends.
b) Fellows are entitled to four weeks of annual vacation and a maximum of ten days for both Eid and emergency leave. Additionally, they should always follow the updated SCFHS rules and regulations for leave.
c) Sick and maternity leave should be compensated for during training or at the end of training, and fellows will always follow the updated SCFHS rules and regulations on taking leave.

LEARNING AND COMPETENCIES

Introduction to Learning Outcomes and Competency-Based Education

Trainees should acquire competence in the following areas:

Medical Expertise

The fellow should acquire knowledge and skills in the following areas during clinical rotations:

The etiology, pathogenesis, natural history, pathology, clinical picture, and management of the following:

1. Acute illnesses due to various microbial agents, including acute communicable diseases occurring in normal hosts due to important:
   a. Bacterial pathogens, including mycobacterial diseases.
   b. Fungal agents.
   c. Viral pathogens.
   d. Tropical and parasitic diseases, particularly malaria, leishmaniasis, and schistosomiasis.
2. Fever and inflammatory response.
3. Systemic inflammatory response syndrome, sepsis, and septic shock.
4. Hemophagocytic lymphohistiocytosis and macrophage activating syndrome.
5. Fever without a focus:
   a. Fever without localizing signs.
   b. Fever of unknown origin.
6. Focal and generalized lymphadenopathy.
7. Ear, nose, and throat infections:
   a. Pharyngitis.
   b. Oral cavity infections.
   c. Otitis media and otitis externa.
   d. Sinusitis.
   e. Mastoiditis.
8. Cardiac and vascular infections:
   a. Endocarditis and other intravascular infections.
   b. Myocarditis.
   c. Pericarditis.
9. Respiratory tract infections:
   a. Bronchiolitis.
   b. Acute pneumonia and its complications.
   c. Pneumonia in immunocompromised host.
10. Central nervous system infections:
    a. Acute bacterial meningitis.
    b. Chronic meningitis.
    c. Aseptic and viral meningitis.
    d. Encephalitis.
    e. Para- and post-infectious neurologic syndromes.
    f. Focal suppurative infections of the nervous system.
    g. Eosinophilic meningitis.
    h. Prion diseases.
11. Genitourinary tract infections:
    a. Urinary tract infections.
    b. Renal abscess and other complex renal infections.
    c. Urethritis, vulvovaginitis, and cervicitis.
    d. Pelvic inflammatory disease.
    e. Epididymitis, orchitis, and prostatitis.
    f. Sexually transmitted infectious syndromes.
    g. Infectious diseases in child abuse.

12. Gastrointestinal and intra-abdominal infections:
    a. Viral gastroenteritis.
    b. Inflammatory enteritis.
    c. Enteric diseases transmitted through food, water, and zoonotic exposure.
    d. Necrotizing enterocolitis.
    e. Acute hepatitis.
    f. Chronic hepatitis.
    g. Granulomatous hepatitis.
    h. Acute pancreatitis.
    i. Cholecystitis and cholangitis.
    j. Peritonitis.
    k. Appendicitis.
    l. Intra-abdominal, visceral, and retroperitoneal abscesses.
13. Skin and soft-tissue, bone and joint infections:
    a. Superficial bacterial skin infections and cellulitis.
    b. Erythematous macules and papules.
    c. Vesicles and bullae.
    d. Purpura.
    e. Urticaria and erythema multiforme.
    f. Papules, nodules, and ulcers.
    g. Subcutaneous tissue infections and abscesses.
    h. Myositis, pyomyositis, and necrotizing fasciitis.
    i. Osteomyelitis.
    j. Infectious and inflammatory arthritis.
    k. Diskitis.
    l. Transient synovitis.
14. Ophthalmologic infections:
    a. Conjunctivitis.
    b. Infective keratitis.
    c. Uveitis, retinitis, and chorioretinitis.
    d. Endophthalmitis.
    e. Periorbital and orbital cellulitis.
15. Infections following trauma.
16. Infections following burns.
17. Infections following bites.
18. Infections related to pets and exotic animals.
19. Tick-borne infections.
20. Nosocomial infections.
21. Infections in immunocompromised hosts (congenital and acquired), including patients with acquired immunodeficiency syndrome (AIDS), burn patients, and organ transplant recipients.
22. Intrauterine and neonatal infections including congenital infections.
23. Infections associated with medical devices and prosthetics.
24. Infections in children with inborn errors of metabolism, genetics, and other systemic disorders.
25. Surgical and OB/GYN infections.
26. Zoonosis.
27. Infections related to travel.

The fellow should recognize and acquire knowledge and skills in the following areas during microbiology rotations:

General knowledge and technical skills in all principal areas of diagnostic microbiology, virology, and parasitology, including knowledge of appropriate diagnostic materials for most diseases or syndromes and the ability to differentiate normal flora from pathological organisms. (See the attached detailed Microbiology Objectives.)

Trainees will spend four months engaged in full-time learning of diagnostic microbiology and molecular techniques under the supervision of a certified microbiologist in an accredited laboratory for training in medical microbiology.

The following areas of laboratory training are considered essential:

1. General Microbiology:
   a. Routine techniques, including the use of different culture media, specimen collection, primary inoculation, and various staining techniques.
   b. Bench experience and familiarity with special isolation and identification techniques related to urine, respiratory, blood, tissue, body fluids, and enteric and anaerobic bacteriology.
   c. Antibiotic susceptibility testing and assays for antibiotic levels.
2. TB/Fungi and Parasitology:
   a. Specimen collection, transport, media for fungi, and mycobacteriology.
   b. AFB staining and antibiotic sensitivity testing for mycobacteria.
   c. Identification of common fungi, including Candida, Aspergillus, and Cryptococcus, and fungal serology and antigen detection.
   d. Stool examination for ova, trophozoites, and larvae; concentration techniques; string test; special stains; serology.
3. Virology, mycoplasma, and chlamydia:
   a. Virus isolation for herpes viruses, respiratory viruses, and enteric viruses.
   b. Viral serology, including EBV, hepatitis, HIV, measles, and rubella.
   c. Chlamydia and mycoplasma isolation and antigen detection systems.
   d. Special techniques: - Quantitative bacteriology, rapid diagnostic techniques, ELISA, immunofluorescence, DNA probes, electron microscopy, etc.
4. Special Techniques:
   a. Quantitative bacteriology, rapid diagnostic techniques, ELISA, immunofluorescence, DNA probes, and electron microscopy.

The fellow should recognize and acquire knowledge and skills in the following areas during infection control rotations:

Infection Control and Nosocomial Pathogens (See Appendix C for a detailed description of rotation.)

1. Role of the microbiology laboratory in infection control and surveillance.
2. Infection control unit's organization and function.
3. Epidemiology and laboratory investigation of nosocomial outbreaks, including bio typing, phage typing, and plasmid analysis.
4. Hospital Acquired infections: **(SCFHS Universal Topic)**
   a. Discuss the epidemiology of HAI with special reference to HAI in Saudi Arabia.
   b. Recognize HAI as one of the major emerging threats in healthcare.
   c. Identify the common sources and set-ups of HAI.
   d. Describe the risk factors for common HAI such as ventilator-associated pneumonia, MRSA, CLABSI, and vancomycin-resistant Enterococcus (VRE).
   e. Identify the role of healthcare workers in the prevention of HAI.
   f. Determine appropriate pharmacological (e.g., selected antibiotic) and non-pharmacological (e.g., removal of indwelling catheter) measures for the treatment of HAI.
   g. Propose a plan to prevent HAI in the workplace.

The fellow should recognize and acquire knowledge and skills in the following areas during immunology rotations:

Knowledge of immunology and immunization practices (see Appendix E for detailed immunology rotation objectives.)

1. Details of humoral, cell-mediated, and phagocytic responses to microbial colonization and invasion in normal and abnormal hosts.

2. Pathogenic mechanisms by which immune response facilitates or prevents diseases.
3. Principles and practice of immunization techniques together with the adverse effects and efficacy of immunizing agents.

The fellow should recognize and acquire knowledge and skills in the following areas during the Antibiotic Stewardship Program rotation:

1. Recognize antibiotic resistance as one of the most pressing global public health threats.
2. Describe the mechanism of antibiotic resistance.
3. Determine the appropriate and inappropriate use of antibiotics.
4. Develop a plan for safe and proper antibiotic use, including appropriate indications, duration, types of antibiotics, and discontinuation.
5. Be apprised of the local guidelines in the prevention of antibiotic resistance.
6. Knowledge of antimicrobial pharmacology is to include:
   a) Classification of antimicrobial agents.
   b) Pharmacokinetics in normal and abnormal hosts.
   c) Mechanism of action and resistance.
   d) Toxicity and drug interaction.
   e) Transplacental transfer and potential effects on the fetus.
   f) Transfer by breast-feeding.

This will be taught through several sessions on the topic, along with case-based discussions. The fellow will also have the opportunity to contribute to the Antibiotic Stewardship Program through IPC, clinical, or elective rotation and document this in their portfolio.

THE INTRINSIC COMPETENCIES REQUIRED BY THE PEDIATRIC INFECTIOUS DISEASES PROGRAM

1. Communicator

The program ensures adequately structured teaching of oral communication skills between fellows and a variety of other individuals encountered in the specialty to enable fellows to effectively:

a) Interact with patients and their families, colleagues, students, and co-workers from other disciplines to develop a shared care plan.
b) Describe to patient/parents the diagnosis and communicate the plan of care in an understandable and appropriate manner.
c) Write patient records and utilize an electronic medical record when available.
d) Write medical reports and letters of consultation or referral when needed.
e) Communicate with patients and family with compassion and in a culturally sensitive manner.
f) Incorporate the principles of appropriate disclosure of patient safety incidents **(SCFHS Universal Topic)**.
    1. Know which incidents require disclosure and what the threshold is for disclosure to patients.
    2. Use a framework to disclose incidents to the patient.

2. Collaborator

The program will teach and develop collaborative skills related to pediatric infectious diseases to enable fellows to:

a) Work effectively with all members of the interprofessional healthcare team, including other physicians and health professionals.
b) Prepare, organize, and moderate multidisciplinary team meetings and summarize outcomes to provide optimal comprehensive patient care.
c) Learn skills for requesting and providing consultations, including appropriate completion of consultation forms.
d) Manage conflict.
e) Prepare a consultation reply template.
    1. We express our gratitude for these consultations.
    2. Summarize the reason for the consultation in one to two lines. (We consulted a 2-year-old with a coagulase-negative Staphylococcus ventriculoperitoneal shunt infection.)
    3. Brief list of underlying/chronic problems.
    4. History focused on infectious disease.
    5. Targeted infectious disease PMH, travel history, vaccine history FH, and social history, if needed (avoiding a laundry list of negative results).
    6. Focused physical exam.
    7. Summary of infectious disease issue with limited and logical differential diagnosis.
    8. Recommendations based on differential diagnosis.
    9. Someone from the consulting team must be contacted and given a summary of the above.
f) Apply a structured handover method at various points of transfer of service, such as IPass or SBAR **(SCFHS Universal Topic)**.

3. Manager

The program will ensure that fellows participate in activities that contribute to the effective management and administration of their healthcare organizations and systems.

a) Fellows should be able to demonstrate the effective allocation of finite healthcare resources.
b) Fellows should be able to understand how to manage their practices and career plans.
c) The program will provide opportunities for fellows to serve in administrative and leadership roles, based on the discipline.

d) Fellows are responsible for managing team rounds, which may include students, residents, and other medical personnel.

4. Health Advocate

The program will ensure that fellows can understand and promote the health of individual patients, communities, and populations.

a) Fellows should be able to identify and understand the health needs and priorities of infectious diseases of the communities they serve.
b) Fellows should be able to identify risk factors related to pediatric infectious diseases and know how to intervene.
c) Fellows should be able to identify advocacy issues within the specialty for individuals, communities, and populations, such as, but not limited to:
    1. Vaccine awareness, promotion, and side effects and how to respond to misinformation regarding routine, seasonal, and special vaccines.
    2. Zoonotic infections and their prevention.
    3. Outbreak control.
d) Fellows should be able to respond to individual patient health needs and issues as part of patient care and advocate for patients with other services and specialties.

5. Scholar

The program will ensure that opportunities are provided for fellows to develop effective teaching skills by teaching colleagues and students through seminars or conference presentations, clinical and scientific reports, and patient education.

a) The fellow should acquire the requisite skills for the critical appraisal of medical literature using knowledge of research methodology and biostatistics.
b) The fellow will acquire skills in self-assessment and self-directed life-long learning.
c) The fellow should be able to conduct a scholarly project.
d) Teaching Responsibilities: Fellows will be provided the opportunity to develop effective teaching skills. This will be achieved through daily rounds and informal group discussions, in addition to formal teaching sessions and written consultation reports.
e) Research: Fellows are expected to participate in the research activities of the pediatric infectious diseases section. By the end of the training period, they should complete one research project, prepare and submit at least one manuscript to a refereed journal, and/or present a paper at a local or international scientific meeting. Acceptable research projects include the following:
    1. Analysis of a contemporary clinical problem involving human subjects using acceptable statistical methods is required. The results of this analysis are to be reported at local or national meetings and should be eligible for publication in scientific journals.
    2. Supervised participation in an ongoing project in experimental medicine.
    3. Quality assurance study of clinical practice.
    4. Study in medical education.
    5. Other proposals accepted by the program.

6. Professional

The program will ensure the effective teaching of appropriate professional conduct and ethical behaviors so that fellows are able to:

a) Deliver the highest-quality care with integrity, honesty, compassion, and confidentiality.
b) Exhibit appropriate professional and interpersonal behaviors.
c) Practice medicine in an ethically responsible manner.
d) Understand the basic principles and practices of bioethics as they relate to their specific clinical discipline.

e) Acquire knowledge of relevant Saudi legislation and regulations to guide their practice in their specific discipline.
f) Be aware of the importance of physician health and well-being and their importance in the development of sustainable practices.
g) Identify and apply the elements of patient safety culture (SCFHS Universal Topic).

ACADEMIC ACTIVITIES

General Principles

a) Teaching should contain both:
   i. A structured-programmatic component
   ii. A practice-based component
b) Efforts should be directed to enhance fellows' responsibility for self-directed learning.
c) Every week, at least 2–4 hours of formal training (commonly referred to as an academic half-day) should be reserved. "Formal teaching time" is an activity that is planned, with an assigned tutor, time slots, and a venue. Formal teaching time excludes bedside teaching, clinic posting, etc. (40 sessions per year).
d) Formal training time should be supplemented by other practice-based learning (PBL) activities, such as:
   i. Morning report of case presentations.
   ii. Morbidity and mortality reviews.
   iii. Journal clubs.
   iv. Grand rounds.
   v. Regional citywide activity and pediatric infectious disease academic activity.
   vi. Continuous professional activities (CPD) relevant to specialty.
e) Fellows should assign at least one hour periodically to meet with their mentors in order to review performance reports (e.g., ITER, e-portfolio)

Courses and Workshops

1. Fellows should attend research courses (mandatory).
2. Fellows are encouraged to participate in community activities (voluntary).

Universal Topics in Infectious Diseases

Background

Universal Topics were developed as learning resources for fellows. These are important topics for fellows because they are either very common and deal with important clinical conditions, or they are not taught effectively in many medical schools. Please see the following link for more information: https://lms.scfhs.org.sa/course/index.php?categoryid=9%3EUniversal%20Topics

The assigned topics should be completed within the allocated year. Trainees and mentors should take personal initiative to complete universal topics on time.

The fellow will have the opportunity to contribute to the Antibiotic Stewardship Program and the hospital acquired infections program (Modules 1 and 2) through IPC, clinical, or elective rotation in F1 and F2, with documentation in their portfolio. This can be executed in either year, but the fellow can not graduate until they complete both.

– Refer to Appendix A.

Module 1: Introduction

1. Safe drug prescribing
2. Hospital acquired infections
3. Sepsis, SIRS, and DIVC
4. Antibiotic stewardship

Safe Drug Prescribing: At end of the learning unit, students should be able to:

a) Recognize the importance of safe drug prescribing in healthcare.
b) Describe various adverse drug reactions with examples of commonly prescribed drugs that can cause such reactions.
c) Apply the principles of drug-drug interactions, drug-disease interactions, and drug-food interactions in common situations.
d) Apply the principles of prescribing drugs in special situations such as renal failure and liver failure.
e) Apply principles of prescribing drugs for elderly and pediatric patients and during pregnancy and lactation.
f) Promote evidence-based cost-effective prescribing.
g) Discuss the ethical and legal frameworks governing safe drug prescriptions in Saudi Arabia.

Hospital Acquired Infections (HAI): At the end of the learning unit, students should be able to:

a) Discuss the epidemiology of HAI with special reference to HAI in Saudi Arabia.
b) Recognize HAI as one of the major emerging threats in healthcare.
c) Identify the common sources and set-ups of HAI.
d) Describe the risk factors for common HAIs such as ventilator-associated pneumonia, MRSA, CLABSI, and vancomycin-resistant Enterococcus (VRE).
e) Identify the role of healthcare workers in the prevention of HAI.
f) Determine appropriate pharmacological (e.g., selected antibiotic) and non-pharmacological (e.g., removal of indwelling catheter) measures for the treatment of HAI.
g) Propose a plan to prevent HAI in the workplace.

Sepsis, SIRS, and DIVC: At the end of the learning unit, students should be able to:

a) Explain the pathogenesis of sepsis, SIRS, and DIVC.
b) Identify patient-related and non-patient-related predisposing factors for sepsis, SIRS, and DIVC.
c) Recognize a patient at risk of developing sepsis, SIRS, or DIVC.
d) Describe the complications of sepsis, SIRS, and DIVC.
e) Apply the principles of management to patients with sepsis, SIRS, and DIVC.
f) Describe the prognosis of sepsis, SIRS, and DIVC.

Antibiotic Stewardship: At end of the learning unit, students should be able to:

a) Recognize antibiotic resistance as one of the most pressing global public health threats.
b) Describe the mechanism of antibiotic resistance.
c) Determine the appropriate and inappropriate use of antibiotics.
d) Develop a plan for safe and proper antibiotic usage, including the right indications, duration, types of antibiotics, and discontinuation.
e) Be apprised of local guidelines for the prevention of antibiotic resistance.

Module 2: Ethics and Healthcare

1. Occupational hazards of healthcare workers (HCW).
2. Patient advocacy.
3. Ethical issues: treatment refusal and patient autonomy.
4. Role of doctors in death and dying.

Occupation Hazards of Healthcare Workers (HCW): At the end of the learning unit, students should be able to:

a) Recognize common sources and risk factors of occupational hazards among HCW.
b) Describe common occupational hazards in the workplace.
c) Develop familiarity with legal and regulatory frameworks governing occupational hazards among HCW.
d) Develop a proactive attitude to promote workplace safety.
e) Protect themselves and colleagues from potential occupational hazards in the workplace.

Patient Advocacy: At end of the learning unit, students should be able to:

a) Define patient advocacy.
b) Recognize patient advocacy as a core value governing medical practice.
c) Describe the role of patient advocates in the care of patients.
d) Develop a positive attitude toward patient advocacy.
e) Be a patient advocate in conflicting situations.
f) Be familiar with local and national patient advocacy groups.

Ethical issues: treatment refusal, patient autonomy: At the end of the learning unit, students should be able to:

a) Predict situations in which a patient or family member is likely to decline prescribed treatment.
b) Describe the concept of "rational adult" in the context of patient autonomy and treatment refusal.
c) Analyze key ethical, moral, and regulatory dilemmas in treatment refusal.
d) Recognize the importance of patient autonomy in the decision-making process.
e) Counsel patients and families declining medical treatment in light of the patients' best interests.

Role of Doctors in Death and Dying: At end of the learning unit, students should be able to:
a) Recognize the important role a doctor can play during the dying process.
b) Provide emotional and physical care to a dying patient and their family.
c) Provide appropriate pain management to a dying patient.
d) Identify suitable patients and refer them to palliative care services.

F1	F2
Module	**Module**
Module 1: Introduction 1. Safe drug prescribing 2. Hospital acquired infections 3. Sepsis, SIRS, and DIVC 4. Antibiotic stewardship	**Module 1: Introduction** 1. Safe drug prescribing 2. Hospital acquired infections 3. Sepsis, SIRS, and DIVC 4. Antibiotic stewardship
Module 2: Ethics and Healthcare 1. Occupational hazards of HCW 2. Patient advocacy 3. Ethical issues: treatment refusal and patient autonomy 4. Role of doctors in death and dying	**Module 2: Ethics and Healthcare** 1. Occupational hazards of HCW 2. Patient advocacy 3. Ethical issues: treatment refusal patient autonomy 4. Role of doctors in death and dying

Fellows will not graduate if they do not complete these modules during her residency.

ASSESSMENT OF LEARNING

1. Purpose of Assessment

Assessment plays a vital role in the success of postgraduate training. Assessment guides trainees and trainers alike in achieving targeted learning objectives. Moreover, reliable and valid assessment provides an excellent means of training improvement as it informs the following aspects: curriculum development, teaching methods, and quality of the learning environment. Assessment can serve the following purposes:

a) **Assessment for learning**: Trainers use information from trainees' performance to inform their learning for improvement.
b) **Assessment as learning**: Assessment criteria drive trainees' learning.
c) **Assessment of learning**: Assessment outcomes represent quality metrics that can improve the learning experience.

For the sake of the organization, assessment will be further classified into two main categories: *Formative* and *Summative*.

2. Formative Assessment

SAUDI PEDIATRIC INFECTIOUS DISEASES FELLOWSHIP TRAINING PROGRAM Promotion Examination

Written Examination Format:

- A written examination consists of one paper with more than 100 MCQs with a single best answer (one correct answer out of four options).
- The examination contain type K1 (recall and comprehension) and type K2 (interpretation, analysis, reasoning, and decision-making) and type K1 (recall and comprehension) questions.
- The examination should includes basic concepts and clinical topics relevant to the specialty.

- Clinical presentation questions include history, clinical findings, and patient approaches. The diagnosis and investigation questions include possible diagnosis and diagnostic methods. Management questions include treatment and clinical management (either therapeutic or non-therapeutic) and complication management. The materials and instruments questions include material properties, usage, selection of instruments, and equipment used. The health maintenance questions include health promotion, disease prevention, risk factor assessment, and prognosis.

The trainee's performance is assessed in each of the evaluation formulas according to the following scoring system:

المعايرة	أقل من ٥٠ %	٥٠- ٥٩,٤ %	٦٠- ٦٩,٤ %	أكثر من ٧٠ %
التوصيف	Clear Fail	Borderline Fail	Borderline Pass	Clear Pass

To upgrade from the training level to the next level, the trainee must obtain at least a Borderline Pass result in each evaluation form.

The program director may recommend that the local supervision committee request the promotion of a trainee who did not meet the previous promotion requirement based on the following:

1. If the trainee obtains a Borderline Fail result in one of the evaluation forms, the remaining evaluation forms must be passed with a Clear Pass in at least one of them.
2. When the trainee obtains a Borderline Fail result in a maximum of two of the evaluation forms, provided they do not fall under the same theme; for example, knowledge, attitude, and skills, the remaining evaluation forms must be passed with Clear Pass in at least two of them.

3. In this case, the promotion must be approved by the Scientific Council for the specialization.

F1 (First year) to F2 (Second year):

According to SCFHS rules and regulations regarding the promotion of fellows from F1 to F2 (included in fellows' packages and on the SCFHS website), fellows must be assessed in the following three areas:

Knowledge (المعرفة), Skills (المهارة), and Attitude (السلوك)

using different tools. Each tool will be assessed using a system of:

Clear Pass (CP), Borderline Pass (BP), Borderline Fail (BF), and Clear Fail (CF).

The F1 candidate must achieve at least a Borderline Pass (BP) in all tools to be promoted.

The F2 candidate must achieve at least a Borderline Pass (BP) in all continuous assessment tools to attend the final certification examination.

Please see the detailed description in SCFHS.

The tools determined by the Pediatric Infectious Diseases Scientific Committee are as follows:

KNOWLEDGE:

1. Written Promotion Examination (for F1): A final written examination composed of 80–100 MCQs and/or a number of short-answer questions to be administered before the end of the first year.
2. Academic half-days (four topic/case presentations per year are required) and participation in a journal club (at least three times per year).
3. Knowledge-based academic activities (Required for F1 and F2): The fellow will be required to answer a total of 15 MCQs (quizzes), which will be discussed to ensure proper feedback and progress. This will be with a brief correct answer vignette and 2–3 references. Fellows will receive material and orientation on Item Writing in the first month of training.

SKILLS:

1. **Research نشاط بحثي (Required for F1 and F2): Research requirements of the SCFHS Pediatric Infectious Diseases Fellowship Program:**
   - F1 candidates are required to submit an official pediatric ID and an institutionally approved proposal by the end of November to receive either a Clear Pass (CP) or a Borderline Pass (BP), depending on the quality, originality, and complexity of the design.
   - F2 candidates must submit a complete manuscript ready for publication at the end of the program to receive a Clear Pass (CP) or Borderline Pass (BP) based on the quality, originality, and complexity of the design.

Accepted Research Projects:

- Accepted single fellow projects include case series with review and descriptive retrospective reviews, for example, "All cases of brucellosis from 2010 to 2019 were reviewed ..."
- Accepted single or shared fellow projects include hypothesis-driven studies with a sample size of at least 100, such as patient-questionnaire-based cross-sectional studies.
- Case control studies.
- Retrospective and prospective cohort studies.

Case reports, while highly encouraged because they are an excellent way of getting started in research and practicing academic writing and responding to editors, do not meet the research requirement for F1 promotion or for attending the final certification examination for F2.

We encourage fellows to select a supervisor (who may be from outside the pediatric ID division; for example, from microbiology, pharmacology, or pathology) and a topic within the first three months of the program in order to have sufficient time to complete requirements before the end of the year.

2. **Portfolio (Required for F1 and F2):**
   - Should have chapters or tabs?
   - Each entry will require a brief (~ 150–-2500--word) reflection on what was learned.
   - Should be electronic.
   - Chapters/Folders:

1. Rotations:
   Titled based on that month's rotation; for example, "Clinical at KAMC," "LAB," "Infection Control."

   Describe briefly:

   - 2-3 interesting cases.
   - List what was newly learned from these cases.
   - Diagnostic challenges (e.g., ethical issues of a case).
   - Describe management issues such as dealing with residents, telephone consults, and night calls, e.g., what was newly learned about infection control? Can it be applied to your institution? What are the difficulties that may arise in trying to implement them?
   - ~~For example, what was newly learned about in infection control? Can it be applied to your institution?, and Wwhat are the difficulties that may arise in trying to implement them?~~
   - This is the same for "LAB" or "Adult rotations." Each will have a section in the "Rotations" chapter.
   - Reflections on the quality of rotation and how it can be improved.
2. Case/topic presentations that are formally assessed with the evaluation form. Four are required per year:
   Insert full PowerPoint presentations in portfolio.
3. Journal Club (at least three times per year):
   Insert chosen articles and summary of critical review, such as PICO.
4. Insert any other academic activities:
   - Document and summarize the local or international conferences attended.
   - Document and briefly summarize other conferences or workshops attended, such as the Introduction to Clinical Research and Statistics.
5. Any other activities or projects such as:
   - Infection control or audit/quality improvement projects or activities.
   - Membership in committees. Describe how these committees function, their benefits and difficulties, whether they could be utilized in your institution of other models, etc.

ATTITUDE:

The assessment tool for this competency will be assessed by the monthly ITER using various daily direct observations, case discussions, or other tools, as needed.

Pediatric infectious diseases assessment tools:

	Knowledge			Skill		Attitude
	Academic activities	End of year progress test (YEPT-nt)	CBD			
F1	1- Academic half-days (Topic presentations	End of year progress test	6 case-based discussions per year	Research	Portfolio***	ITERS

	and journal club) 2- Answer MCQs (quizzes) **					
F2	1- Academic half-days (Topic presentations and journal club) 2- Answer MCQs (quizzes) **		6 case-based discussions per year	Research	Portfolio***	ITERS

** Answer 15 MCQs (quizzes). This will be discussed to ensure proper feedback and progress.

*** Portfolio needs to include data collection, reflection, and follow-up.

Refer to Appendix F.

Promotion Examination Blueprint

No.	Sections	Percentage
1	Microbiology	9%
2	Antibiotics /Antimicrobial stewardship	9%
3	Tropical diseases / Travel medicine / Emerging infectious diseases	8%
4	Fungal infections	5%
5	Exanthemtous / Viral diseases	6%
6	Immunodeficiency and immunocompromised patients	8%
7	Sepsis and health care associated infections	9%
8	Congenital and Neonatal infections	5%
9	Immunization/ Chemoprophylaxis	6%
10	Infection control	8%
11	Ambulatory infections	8%
12	Specific infection (CNS, Res, GIT, GUT, Skin, Joint)	19%
Total		**100%**

Note:

- Blueprint distributions of the examination may differ up to +/-5% in each category.
- Percentages and content are subject to change at any time. See the SCFHS website for the most up-to-date information.
- Research, Ethics and Professionalism and Patient Safety are incorporated within the various domains.

Refer to Appendix G.

3. Summative Assessment

SAUDI PEDIATRIC INFECTIOUS DISEASES FELLOWSHIP TRAINING PROGRAM

Final Examination

The final Saudi Pediatric Infectious Disease Examination is composed of the following:

Written Examination:

1. One paper with 100 multiple-choice questions (includes clinical scenarios with a single best answer out of four options.
2. Refer to Appendix H.

No.	Sections	Percentage
1	Microbiology	8%
2	Antimicrobial agents / Antimicrobial stewardship	10%
3	Tropical Diseases / Travel medicine / Emerging infectious diseases	11%
4	Fungal Infections	5%
5	Exanthematous Diseases / Viral infections	7%
6	Immunodeficiency and Infection in immunocompromised Patients	9%
7	Sepsis and Health Care Associated Infections	8%
8	Congenital and Neonatal Infections	6%
9	Immunization / Chemoprophylaxis	6%
10	Infection Control	6%
11	Ambulatory Infections	6%
12	Specific System Infections (CNS, Respiratory, GIT, GUT, Skin, Joint)	18%
Total		**100%**

Note:

- Blueprint distributions of the examination may differ up to +/-5% in each category.
- Percentages and content are subject to change at any time. See the SCFHS website for the most up-to-date information.
- Research, Ethics and Professionalism and Patient Safety are incorporated within the various domains.

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Clinical Examination

a. The pediatric infectious diseases final clinical examination shall consist of 6 graded stations each with 10-minute encounters.

b. The stations consist of 5 structured oral exam (SOE) stations with two examiners each.

c. All stations shall be designed to assess integrated clinical encounters.

d. SOE stations shall be designed with preset questions and ideal answers.

e. One objective structured clinical examination station with one examiner.
f. Refer to Appendix I.

		DIMENSIONS OF CARE				
		Health Promotion and Illness Prevention	**Acute**	**Chronic**	**Psychosocial Aspects**	**# Stations**
DOMAINS FOR INTEGRATED CLINICAL ENCOUNTERS	**Patient Care**		2	1		3
	Patient Safety and Procedural Skills	1				1
	Communication & Interpersonal Skills					0
	Professional Behaviors					0
	Total Stations	1	2	1	0	4

CERTIFICATION OF TRAINING COMPLETION

Upon completion of the training and passing of the final certification examination, the trainee will be awarded the Saudi subspecialty certificate for pediatric infectious diseases.

RESOURCES

Suggested Textbooks

1. **Clinical Infectious Diseases**
   a) Textbook of Pediatric Infectious Diseases – Feigin & Cherry
   b) Infectious Diseases of the Fetus and Newborn - Remington & Klein
   c) Pediatric Infectious Diseases - Moffet
   d) Principle and Practice of Pediatric Infectious Diseases – Sarah Long

2. **Adult Oriented**
   a) A Practical Approach to Infectious Diseases - Reese & Bells
   b) Principle & Practice of Infectious Diseases - Mandell
   c) Tropical and Geographic Medicine - Warren & Adel Mahmoud
   d) Hunter's – Tropical Disease

3. **Medical Microbiology**
   a) Medical Microbiology - Sherris
   b) Medical Microbiology – Mims

4. **Policies and Standard of Care**
   a) Red Book
   b) MWWR – special issues

5. **Review and Update**
   a) Seminar in Pediatric Infectious Diseases - 4 issues/year
   b) Advances in Pediatric Infectious Diseases - once/year
   c) Infectious Diseases Clinic of N.A.
   d) Current Opinion in Infectious Diseases (All issues - August: Ped)
   e) Current Opinion in Pediatrics (February)

6. **Journals**
   a) The Pediatric Infectious Diseases Journal
   b) Clinical infectious diseases
   c) The Journal of Infectious Diseases
   d) The Canadian Journal of Infectious Diseases
   e) New England Journal of Medicine
   f) Journal of Pediatrics
   g) Pediatrics

7. **Web Resources**
   The following websites may be consulted for recommended conferences and scientific events:

   a) WSPID: World Society of Pediatric Infectious Diseases, www.wspid.com
   b) ICAAC: Interscience Conference on antimicrobial agents and chemotherapy: www.icaac.org
   c) IDSA: Infectious Diseases Society of America: www.idsociety.org
   d) ESPID: European Pediatric Infectious Diseases Society: www.espid.org
   e) ESCMID: European Society of Clinical Microbiology and Infectious Diseases: www.escmid.org
   f) Local institutions' CME calendars
   g) Other Websites:
      a. www.cdc.gov
      b. Error! Hyperlink reference not valid.
      c. www.pids.org

APPENDICES

Appendix A: Universal Topics

Universal Topics in Infectious Diseases

Module 1: Introduction

1. Safe drug prescribing
2. Hospital acquired infections
3. Sepsis, SIRS, and DIVC
4. Antibiotic stewardship

Safe drug prescribing: At the end of the learning unit, students should be able to:

a) Recognize the importance of safe drug prescribing in healthcare.
b) Describe various adverse drug reactions with examples of commonly prescribed drugs that can cause such reactions.
c) Apply the principles of drug-drug interactions, drug-disease interactions, and drug-food interactions in common situations.
d) Apply the principles of prescribing drugs in special situations such as renal failure and liver failure.
e) Apply principles of prescribing drugs for elderly and pediatric patients and during pregnancy and lactation.
f) Promote evidence-based, cost-effective prescribing.
g) Discuss ethical and legal frameworks governing safe drug prescriptions in Saudi Arabia.

Hospital Acquired Infections (HAI): At the end of the learning unit, students should be able to:

a) Discuss the epidemiology of HAI with special reference to HAI in Saudi Arabia.
b) Recognize HAI as one of the major emerging threats in healthcare.
c) Identify the common sources and set-ups of HAI.
d) Describe the risk factors for common HAI such as ventilator-associated pneumonia, MRSA, CLABSI, and vancomycin-resistant Enterococcus (VRE).
e) Identify the role of healthcare workers in the prevention of HAI.
f) Determine appropriate pharmacological (e.g., selected antibiotic) and non-pharmacological (e.g., removal of indwelling catheter) measures for the treatment of HAI.
g) Propose a plan to prevent HAI in the workplace.

Sepsis, SIRS, and DIVC: At the end of the learning unit, students should be able to:

a) Explain the pathogenesis of sepsis, SIRS, and DIVC.
b) Identify patient-related and non-patient-related predisposing factors for sepsis, SIRS, and DIVC.
c) Recognize a patient at risk of developing sepsis, SIRS, or DIVC.
d) Describe the complications of sepsis, SIRS, and DIVC.
e) Apply the principles of management to patients with sepsis, SIRS, and DIVC.
f) Describe the prognosis of sepsis, SIRS, and DIVC.

Antibiotic Stewardship: At end of the learning unit, students should be able to:

a) Recognize antibiotic resistance as one of the most pressing global public health threats.
b) Describe the mechanism of antibiotic resistance.
c) Determine the appropriate and inappropriate use of antibiotics.
d) Develop a plan for safe and proper antibiotic usage, including the right indications, duration, types of antibiotics, and discontinuation.
e) Be apprised of local guidelines for the prevention of antibiotic resistance.

Module 2: Ethics and Healthcare

1. Occupational hazards of HCW.
2. Patient advocacy.
3. Ethical issues: treatment refusal and patient autonomy.
4. Role of doctors in death and dying.

Occupation Hazards of Healthcare Workers (HCW): At the end of the learning unit, students should be able to:

a) Recognize common sources and risk factors of occupational hazards among HCW.
b) Describe common occupational hazards in the workplace.
c) Develop familiarity with legal and regulatory frameworks governing occupational hazards among HCW.
d) Develop a proactive attitude to promote workplace safety.
e) Protect themselves and colleagues from potential occupational hazards in the workplace.

Patient Advocacy: At end of the learning unit, students should be able to:

a) Define patient advocacy.
b) Recognize patient advocacy as a core value governing medical practice.
c) Describe the role of patient advocates in the care of patients.
d) Develop a positive attitude toward patient advocacy.
e) Be a patient advocate in conflicting situations.
f) Be familiar with local and national patient advocacy groups.

Ethical issues: treatment refusal, patient autonomy: At the end of the learning unit, students should be able to:

a) Predict situations in which a patient or family member is likely to decline prescribed treatment.
b) Describe the concept of “rational adult” in the context of patient autonomy and treatment refusal.
c) Analyze key ethical, moral, and regulatory dilemmas in treatment refusal.
d) Recognize the importance of patient autonomy in the decision-making process.
e) Counsel patients and families declining medical treatment in light of the patient’s best interests.

Role of Doctors in Death and Dying: At end of the learning unit, students should be able to:

a) Recognize the important role a doctor can play during the dying process.
b) Provide emotional and physical care to a dying patient and their family.
c) Provide appropriate pain management to a dying patient.
d) Identify suitable patients and refer them to palliative care services.

Appendix B: Infection Control Checklist

	Met	Partially Met	Not Met
Infection Control			
Understand the organization, infrastructure, and function of an IP&C Program.			
Know the concept and methodology of surveillance; understand how surveillance is performed for the CDC categories of nosocomial infections such as SSI, VAP, BSI, and UTI.			
Be familiar with epidemiology and laboratory investigation of nosocomial outbreaks.			
Understand the importance of hand hygiene (HH) in the prevention of infection. Different HH agents, effects, side effects, and compliance.			
Identify the common sources and set-ups of HAI. Describe the risk factors of common HAIs, such as ventilator-associated pneumonia, MRSA, CLABSI, and vancomycin-resistant Enterococcus (VRE).			
Identify the role of healthcare workers in the prevention of HAI.			
Determine appropriate pharmacological (e.g., selected antibiotic) and non-pharmacological (e.g., removal of indwelling catheter) measures in the treatment of HAI.			
Public Health			
Learn how to report and cooperate with the Ministry of Health.			
Occupational Health			
Understand bost-exposure management of common ID exposures such as Varicella, TB, needle stick injuries.			
Safety & Environment			
Be knowledgeable about construction and renovation, including airborne pathogen risk associated with construction, current standards for number of hand-washing sinks, number of isolation rooms, ventilation parameters for operating theaters, and ventilation requirement for construction of oncology (BMT and non-BMT) units.			
Understand the principles of cleaning, disinfection, and sterilization of medical devices and infectious waste management.			
Be familiar with lab safety procedures..			

Appendix C: Infection Control Objective

Trainees are provided with opportunities to observe the infection control unit's organization and function. They should actively participate in the Hospital Infection Control Program and attend the meetings of the Hospital Infection Control Committee.

Infection Prevention and Control Rotation Objectives:

- The IP&C Program consists of four main sections: Infection Control, Public Health, Occupational Health and Safety, and Environment.
- The functions within these four sections are more or less integrated, with the major goal being to provide a safe environment for patients, HCWs, visitors, and sitters.
- The Infection Control Section of the department deals with many aspects related to the prevention and control of healthcare-associated infections through education and surveillance.
- Fellows frequently rotate in IP&C to gain an understanding of the diverse areas of infection prevention and control.

SPECIFIC LEARNING OBJECTIVES:

Fellows rotating through the IP&C Training Program should acquire knowledge of:

1. The organization, infrastructure, and function of an IP&C Program.
2. Evidence that IP&C programs enhance patient safety and save money.
3. The role of the IP&C department within a medical institution.
4. How the IP&C department provides consultation services to the institution.
5. The role of the microbiology laboratory in infection control and surveillance.
6. The concept and methodology of surveillance. Fellows should understand how surveillance is performed for the CDC categories of nosocomial infections, such as SSI, VAP, BSI, and UTI.
7. The epidemiology and laboratory investigation of nosocomial outbreaks, including bio typing, phage typing, and plasmid analysis.
8. The importance of hand hygiene ((HH)) in the prevention of infection, the role of contact transmission in infection, the role of HH in preventing transmission, as well as HH agents, effects, side effects, and compliance.
9. The role of IP&C in the planning, construction, and renovation of healthcare facilities, including airborne pathogen risk associated with construction, current standards for the number of hand-washing sinks, number of isolation rooms, ventilation parameters for operating theaters, and ventilation requirements for the construction of oncology (BMT and non-BMT) units.
10. How to report and cooperate with the Ministry of Health and other involved bodies.
11. The principles of cleaning, disinfection, and sterilization of medical devices and infectious waste management.
12. How to advise occupational health and safety on infection control issues, including post-exposure management of common ID exposures such as Varicella, TB, and needle stick injuries.
13. Lab safety procedures.

STRUCTURE OF ROTATION

Fellows will be required to:

1. Attend routine meetings in the department and participate in decision-making discussions, including the hospital's Infection Prevention and Control Committee Meeting and the Antibiotic Committee Meeting.
2. Engage in the different surveillance activities from data collection to data presentation.
3. Join daily IP&C hospital rounds.
4. Conduct nosocomial outbreak investigations.
5. Become involved in the other activities of the IP&C department, such as education, n-service, public health safety, and environmental services.

RESOURCES

1. Association for Professional in Infection Control and Epidemiology, *APIC Text of Infection and Epidemiology*, 2005.

2. Mayhall, G., Hospital epidemiology and infection control (3rd edition) *Philadelphia: Lippincott Williams & Wilkins*, 2004.
3. Heymann, D. Control of Communicable Diseases Manual (18th Edition), 2004. American Public Health Association Publications.
4. Internet Websites:
    1. Center for Disease Control and Prevention, *Guidelines for Hand Hygiene in Healthcare Settings: Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force*.
    2. *MMWR 2003; 52(RR10); 1-48*.
    3. Center for Disease Control and Prevention, *Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP), MMWWR 2003; 52(RRB): 1–36*.

Appendix D: Microbiology Checklist

A. Blood Bench
Gram stain: differentiate gram +ve from gram –ve.
Blood cultures: ☐ The fellow should participate in preparation of at least 5 blood gram stains + inoculate in culture.
*** Recognize different media**:
Selective media:
☐ L.J. media
☐ Middle brook agar
☐ Mannitol salt agar
☐ Brucella agar
☐ Thayer-Martin agar
☐ Bordet-Gengou agar
☐ Novy – Mac Neal – Nicolle (NNN) media ☐ XLD agar
Differential media:
☐ Blood agar plat
☐ MacConkey agar
☐ Sorbitol – MacConkey agar
Non-selective media:
☐ Chocolate agar
☐ Plat count agar
☐ Nutrient agar
Ungrouped media:
☐ Muller-Hinton agar
☐ Sabouraud agar
Recognize different agars and tests for drug susceptibility.
☐ Muller-Hinton agar
☐ E. test
☐ D. test for MRSA
*** Recognize incubators and different automated machines and understand how they work.** ☐ PCR (BD MAX) ☐ PHOENIX M50

☐ MALDTOF ☐ SENSTITER (E-TEST ANTIFUNGAL) ☐ URISED 3 PRO (URINE ANALYSIS) ☐ MGIT 960 (TB C/S) ☐ BACTEC FX
B. Stool Bench
*** Recognize character of stool for different species.**
☐ Ova, cyst, and parasite
☐ Microscopy for Entamoeba
☐ Microscopy for Giardia
☐ Novobiocin disk (*s. sprophyticus*)
C. Urine Bench
• **Recognize different methods of urine sample collection and proper transportation for each test.**
☐ How to detect WBC in urine field.
☐ How to detect bacterial colony in urine sample.
☐ Microscopy for BK virus in urine.
☐ Microscopy for adenovirus in urine. ☐ Novobiocin disk (*s. sprophyticus*)
• **Recognize different tests for urine samples.**
☐ Nitrite
☐ Leukocyte esterase
Serology:
• **Recognize different inflammatory markers and their different methods of measurement.**
☐ CRP
☐ ESR
☐ Procalcitonin
• **Recognize the principle of antigen and antibody reaction.**
☐ Brucella agglutination test
☐ Brucella ELISA
☐ Salmonella titer in stool (typhoid serology)
☐ Yersinia serology in stool

☐ TORCH screening
☐ Monospot test
☐ Hetrophile antibodies for EBV antigens
☐ CMV serology
☐ Mycoplasma – Rapid cold agglutination test
☐ Mycoplasma titer
☐ Echinococcus granulosus serology
☐ Toxoplasma serology – Congenital infection
– Non-congenital infection
☐ Syphilis serology – Treponemal and Non-treponemal
Mycology:
• **Recognize different agars and stains for fungus.:**
☐ Sabouraud agar
☐ Potato dextrose media
☐ Dermatophyte test media
☐ KOH stain
• **Recognize different assays for fungal detection.:**
☐ Galactomannan test:
- Procedure
- Cut-off value
- Kits
☐ 1,3_B-D_glucan test:
- Procedure
- Cut-off value
- Kits
☐ India ink ☐ Silver stain for PCP
T.B.:
• **Recognize different types of acid-fast stains (**ZN, auramine, Kenyan**…)**
☐ Positivity of AFB
☐ QuantiFERON assay - Different type of tubes
- Procedure

- Cut-off
☐ Solid media for TB
☐ Liquid media for TB
Parasitology:
☐ Dark film
☐ Differentiate between thick and thin film in malaria
☐ Microscopic features of different plasmodium
☐ Significance of different stages of malaria (trophozoite, gametocyte)
☐ How to calculate parasitemia
☐ Microscopic features of Leishmania
☐ Microscopic features of stool parasite
☐ How to test for Schistosoma
☐ Microscopic features of different types of Schistosoma
Virology:
☐ Tzanck test
☐ NPA for virology
☐ Microscopic appearance of common virus (CMV, HSV, etc.)
Molecular Lab:
- **Understanding and recognizing the importance of PCR in different pathogens. Understanding the principle of PCR**
☐ **PCR multiplex in respiratory secretion recognizing the importance of PCR in different pathogens:**
☐ TB PCR
☐ TB PCR in detecting the sensitivity for anti-TB
☐ HSV PCR in CSF
☐ Enterovirus PCR in CSF
☐ PCR in detection of viremia
- Adenovirus
- HHV6
- CMV
- EBV
- HIV
- Hepatitis

☐ PCR in urine for detection of
- Adenovirus
- CMV
- BK virus
☐ PCR in stool for detection of
- Colostridium difficile
☐ PCR in swab for detection of
- MRSA
Histopathology:
Recognize the different pathogens and signs of diseases at the tissue level.
☐ Acid-fast bacilli (AFB)
☐ Granuloma in tissue
☐ Different fungal characteristics at the tissue level:
- Yeast
- Hyphae (recognize different types of hyphae)
☐ Phagocyte in bone marrow
☐ CMV inclusion body
☐ Splendore-Hoeppli bodies in GIT tissue
☐ Preparation of different kinds of tissue for reading.
For Drug Susceptibility Test:
Recognize different drug resistant patterns.
☐ MRSA
☐ MCIM
☐ MDR
☐ XDR
☐ PDR
☐ ESBL
☐ MIC
☐ MBC
☐ TB MDR

☐ TB XDR

Note:

* The aim of this checklist is to guide fellows during laboratory rotation.

* This checklist does not cover all lab items.

* This checklist was not used for assessment purposes or achievement measures.

* Fellows should know that there will be differences among different laboratories in different centers in terms of the availability of some tests.

* Each item should be studied comprehensively.

Appendix E: Immunology Rotation

Objectives	Knowledge	Skills
Ability to clinically suspect immunodeficiency in a child.	Recognize clinical signs and symptoms that raise suspicion of immunodeficiency. Know common presentation and types of infection in various forms of immunodeficiency (i.e., recurrent infection, chronic diarrhea, FTT).	Effectively build-up and approach toward child suspected of having immune deficiency and request specific test. Attend immunology clinic and in-patient service.
Differentiate various types of immunodeficiency.	Presentation of primary immunodeficiency, such as antibodies deficiency, cellular immune deficiency, neutrophil defect (CGD, LAD, Chediak-Higashi), and rare form of immune deficiency.	Ability to interpret laboratory tests requested to confirm immunodeficiency, (e.g., immunoglobulin levels, specific antibody test, leukocyte marker, blastogenesis, test of neutrophil dysfunctions, flow cytometry).
Develop management plan of child with immunodeficiency.	- When to refer to immunology service. - Need for prophylactic antibiotics. - Know which diseases are treated by stem cell transplants.	- Take care of patients with various types of primary immunodeficiency. - Follow-up and take care of immunodeficient patients who undergo BMT.
Management of infectious complications in immunoCompromised-patients.	Know peculiar infections in each type of primary immunodeficiency.	Develop the clinical sense and ability to target probable pathogens in various clinical settings.
Diagnosis and management of infections post-BMT.	Build theoretical knowledge about various infections at different times post-BMT (i.e., early, late infection).	- Suspect and diagnose early, late -post-BMT infections, including viral, bacterial, and fungal infections. - Recognize situations requiring prophylactic antivirals, antibacterials, and antifungals.
Vaccination of immunocompromised host and post-BMT immunization.	- Knowledge of available childhood vaccines and their efficiency in a specific host. - Safe vaccine in immunocompromised host. - Vaccine efficacy post-BMT and scheduling.	

Appendix F: Formative Assessment

Pediatric infectious diseases assessment tools:

	Knowledge			Skill		Attitude
	Academic activities	End of year progress test (YEPT-nt)	CBD			
F1	3- Academic half-days (Topic presentations and journal club) 4- Answer MCQs (quizzes) **	YEPT-nt	6 case-based discussions per year	Research	Portfolio***	ITERS
F2	3- Academic half-days (Topic presentations and journal club) 4- 2- Answer MCQs (quizzes) **		6 case-based discussions per year	Research	Portfolio***	ITERS

** Answer 15 MCQs (quizzes). This will be discussed to ensure proper feedback and progress.

*** Portfolio needs to include data collection, reflection, and follow-up.

Appendix G: Promotion Written Examination Blueprint

No.	Sections	Percentage
1	Microbiology	9%
2	Antibiotics /Antimicrobial stewardship	9%
3	Tropical diseases / Travel medicine / Emerging infectious diseases	8%
4	Fungal infections	5%
5	Exanthemtous / Viral diseases	6%
6	Immunodeficiency and immunocompromised patients	8%
7	Sepsis and health care associated infections	9%
8	Congenital and Neonatal infections	5%
9	Immunization/ Chemoprophylaxis	6%
10	Infection control	8%
11	Ambulatory infections	8%
12	Specific infection (CNS, Res, GIT, GUT, Skin, Joint)	19%
Total		**100%**

Appendix H: Final Written Examination Blueprint Outlines

No.	Sections	Percentage
1	Microbiology	8%
2	Antimicrobial agents / Antimicrobial stewardship	10%
3	Tropical Diseases / Travel medicine / Emerging infectious diseases	11%
4	Fungal Infections	5%
5	Exanthematous Diseases / Viral infections	7%
6	Immunodeficiency and Infection in immunocompromised Patients	9%
7	Sepsis and Health Care Associated Infections	8%
8	Congenital and Neonatal Infections	6%
9	Immunization / Chemoprophylaxis	6%
10	Infection Control	6%
11	Ambulatory Infections	6%
12	Specific System Infections (CNS, Respiratory, GIT, GUT, Skin, Joint)	18%
Total		**100%**

Appendix I: Final Clinical Examination Blueprint*

		DIMENSIONS OF CARE				
		Health Promotion and Illness Prevention	Acute	Chronic	Psychosocial Aspects	# Stations
DOMAINS FOR INTEGRATED CLINICAL ENCOUNTERS	Patient Care		2	1		3
	Patient Safety and Procedural Skills	1				1
	Communication and Interpersonal Skills					0
	Professional Behaviors					0
	Total Stations	1	2	1	0	4

DOMAINS FOR INTEGRATED CLINICAL ENCOUNTER

Definitions

Dimensions of Care	**Focus of care for the patient, family, community, and/or population**
Health Promotion and Illness Prevention	This is the process of enabling people to increase control over their health and its determinants, thereby improving their health. Illness prevention covers measures to not only prevent the occurrence of illness, such as risk factor reduction, but also to arrest its progress and reduce its consequences once established. This includes, but is not limited to, screening, periodic health exams, health maintenance, patient education and advocacy, and community and population health.
Acute	Brief episode of illness, within the time span defined by initial presentation through to transition of care. This dimension includes, but is not limited to, urgent, emergent, and life-threatening conditions, new conditions, and exacerbation of underlying conditions.
Chronic	Illness of long duration that includes, but is not limited to, illnesses with slow progression.
Psychosocial Aspects	Presentations rooted in the social and psychological determinants of health that include, but are not limited to, life challenges, income, culture, and the impact on the patient`s social and physical environment.

Appendix J: Research Rotation Evaluation Form

Saudi Commission for Health Specialties *SCFHS - Pediatric Infectious Diseases	Evaluated By : evaluator's name Evaluating : person (role) or moment's name (if applicable) Dates : start date to end date	

* indicates a mandatory response

Research Rotation Evaluation Form

	n/a	1 Clear fail	2 borderline	3 Clear pass	4 Exceed expectations
*Selection of Research Project	○	○	○	○	○
*Completion of Research Proposal	○	○	○	○	○
*IRB Approval	○	○	○	○	○
*Writing manuscript	○	○	○	○	○
*Submission / Publication	○	○	○	○	○
*Attends to the research course and other learning events	○	○	○	○	○
*Communicates effectively with research team and the supervisor	○	○	○	○	○
*Attends and contributes to research meetings	○	○	○	○	○

*Comments (areas of strengths/areas for improvement)

The following will be displayed on forms where feedback is enabled...
(for the evaluator to answer...)

*Did you have an opportunity to meet with this resident to discuss their performance?

○ Yes

○ No

(for the evaluee to answer...)

*Are you in agreement with this assessment?

○ Yes

○ No

Please enter any comments you have (if any) on this evaluation.

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Appendix K: Infection Control and Prevention Evaluation Form

Saudi Commission for Health Specialties *SCFHS - Pediatric Infectious Diseases	Evaluated By : evaluator's name Evaluating : person (role) or moment's name (if applicable) Dates : start date to end date	

* indicates a mandatory response

Infection Prevention and Control Rotation Evaluation Form

	n/a	Clear fail (1)	Borderline fail (2)	borderline pass (3)	Clear pass (4)
*Specific Practice Areas A. MEDICAL EXPERT: 1-Infection Control Department Structure and Function •Able to describe the organization, objectives, structure, and function of the IPAC Program	○	○	○	○	○
*• Able to assess risk factors for infectious diseases and to monitor current and emerging local and global health threats.	○	○	○	○	○
*•Interpret the importance of evidence-based/informed infection prevention and control policies and procedures	○	○	○	○	○
*2-Surveillance and Epidemiologic Investigation • Illustrates how surveillance is performed for the CDC categories of healthcare associated infections like SSI, VAP, CLABSI/BSI, and UTI.	○	○	○	○	○
*•Able to calculate infection rates, to compare surveillance results to benchmarks and interpret surveillance data	○	○	○	○	○
*•Demonstrates knowledge of outbreak investigation	○	○	○	○	○
*3-Preventing/Controlling the Transmission of Infectious Agents •Describe the importance of Hand Hygiene (HH) in the prevention of infection, Different HH agents, side effects, and methods for HH compliance monitoring	○	○	○	○	○
*•Able to perform infection risk assessment associated with therapeutic and diagnostic procedures and devices (e.g., dialysis, angiography, bronchoscopy, endoscopy, intravascular devices, urinary drainage catheter)	○	○	○	○	○
*4-Employee/Occupational Health •Able to collaborate with employee health regarding recommendations for vaccine preventable diseases, communicable diseases and exposures.	○	○	○	○	○
*•Able to evaluate and provide recommendations for needle stick injuries.	○	○	○	○	○
*•Able to assess and evaluate healthcare personnel who may pose a transmission risk	○	○	○	○	○
*5-Safety and Environment • Able to determine processes for safe evaluation and monitoring of environmental cleaning and disinfection practices and technologies.	○	○	○	○	○
*•Able to monitor for environmental pathogens and processes related to recall of potentially contaminated equipment, food, medications, and supplies.	○	○	○	○	○
*•Able to select the recommendations for construction, renovation, and maintenance projects in the facility based on IPC risk assessment.	○	○	○	○	○
*•Able to identify, observe, and evaluate appropriate cleaning, disinfection, and sterilization practices based on intended use (i.e., Spaulding classification)	○	○	○	○	○

Appendix K: Microbiology Evaluation Form

Saudi Commission for Health Specialties *SCFHS - Pediatric Infectious Diseases	Evaluated By : evaluator's name Evaluating : person (role) or moment's name (if applicable) Dates : start date to end date	

* indicates a mandatory response

Microbiology rotation EVALUATION FORM

	n/a	Clear Fail (1)	Borderline (2)	Clear Pass (3)	Exceed Expectations (4)
*A. MEDICAL EXPERTISE Participation in lab test preparation	○	○	○	○	○
* Adherence to safety &infection control measurements	○	○	○	○	○
*Used test in a cost-effective manner & understands limitations & predictive value.	○	○	○	○	○
*Able to analyze, and do interpretation for different kind of laboratory tests.	○	○	○	○	○
*B. Medical Knowledge: Broad Basic knowledge of a wide variety of different laboratory test	○	○	○	○	○
*Understand the steps of diagnostic cycle	○	○	○	○	○
*Evidence-based Practice/Critical Appraisal Skills	○	○	○	○	○
*Aware of the role of evidence in clinical microbiology.	○	○	○	○	○
*Recognize the role of Medical Microbiology in infection control and antimicrobial stewardship program.	○	○	○	○	○
*Procedural Skills: Perform diagnostic & therapeutic procedures, understands indications.	○	○	○	○	○
*Communicator: Communicate well with lab team.	○	○	○	○	○
* C Collaborator: 11, Communicates effectively with clinical team in informing the results.	○	○	○	○	○
*Works effectively in a team environment with lab staff.	○	○	○	○	○
*D. Leader Serves in administration and leadership roles as appropriate.	○	○	○	○	○
*Appropriate & efficient use of healthcare resources.	○	○	○	○	○
*E. SCHOLAR 14. Attends and contributes to rounds, seminars and other learning.	○	○	○	○	○
*Accepts and acts on constructive feedback.	○	○	○	○	○
*Contributes to the education of junior residents, house staff and students.	○	○	○	○	○
*Contributes in scientific research.	○	○	○	○	○
*F. HEALTH ADVOCATE: Able to identify the psychosocial, economic, environmental & biological factors which influence the health of patients and society.	○	○	○	○	○
*Offers advocacy on behalf of patients at practice and general population levels.	○	○	○	○	○

GLOSSARY

Glossary	
Blueprint	Description correlating educational objectives with assessment contents; for example, 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 entrustment of a trainee by graduation of the program with the required knowledge, skills, and attitude needed to practice unsupervised.
Specialty core content (skills, knowledge, and professional attitude)	A specific knowledge, 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 primarily intended to make judgments or decisions (although it can be a secondary benefit).
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. It may include both constructed (defined by mandatory continuous assessment tools in the 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. It is used to inform judgment and make decisions about the level of learning and certification.
Universal Topic	Knowledge, skills, or professional behavior that is not specific to the given specialty but is universal for the general practice of a given healthcare profession.