Medical Microbiology Training Experiences

2024
VERSION 1.0

These training requirements apply to those who begin training on or after July 1, 2024.

The following training experiences are required, recommended, or optional as indicated.

TRANSITION TO DISCIPLINE (TTD)

The purpose of this stage is the orientation of new trainees to the policies, protocols, resources, and facilities of the residency program, the medical microbiology laboratory, and the institution(s). During this stage, residents will participate in the activities of the laboratory with a focus on the pre-analytic phase, as well as bacteriology. This stage is also used to verify the clinical skills of medical school related to patient assessment.

Required training experiences (TTD stage):

1. Clinical training experiences
   - 1.1. Medical microbiology laboratory experiences focusing on specimen processing and bacteriology
   - 1.2. Any clinical service

2. Other training experiences
   - 2.1. Orientation to the medical microbiology laboratory, including
     - 2.1.1. Laboratory staff and their roles
     - 2.1.2. Laboratory safety
     - 2.1.3. Biosecurity
     - 2.1.4. The diagnostic cycle: specimen collection, transport, processing, analysis, and reporting
     - 2.1.5. Basic laboratory techniques and materials
   - 2.2. Orientation to the hospital(s), including: policies and procedures; information systems and, as applicable, electronic medical records; admission and discharge processes; and relevant care protocols
   - 2.3. Orientation to the program and university, including the faculty and other residents, policies and procedures, resident wellness resources, learning resources, the medical microbiology portfolio, and assessment system

Recommended training experiences (TTD stage):

3. Clinical training experiences
   3.1. Infectious diseases, adult or pediatric population, consultation service or clinic

FOUNDATIONS OF DISCIPLINE (F)

The purpose of this stage is for residents to gain experience assessing and managing patients of all ages, with a broad range of presentations and illnesses, in a range of settings. During this stage, residents perform patient assessments and develop management plans for common presentations. Their experiences in the medical microbiology laboratory focus on bacteriology, and include all aspects of the pre-analytic, analytic, and post-analytic phases of specimen management. During this stage, residents will begin to apply the principles of critical appraisal, and will gain valuable foundational knowledge in quality management, antimicrobial stewardship, and infection prevention and control.

Required training experiences (Foundations stage):

1. Clinical training experiences
   1.1. Medical microbiology laboratory experiences focusing on bacteriology
   1.2. Internal medicine inpatient service[1]
   1.3. Emergency medicine
   1.4. Service providing infectious diseases consultation to critical care units, inpatient services and the emergency department, for both adult and pediatric populations
   1.5. First call[2] coverage for the medical microbiology service

2. Other training experiences
   2.1. Formal instruction in the clinical and biomedical sciences relevant to
      2.1.1. Diagnostic workup of a specimen in the clinical microbiology laboratory
      2.1.2. Initial investigation and management of common infectious disease presentations

   2.2. Introduction to:
      2.2.1. Quality management systems
      2.2.2. Infection prevention and control (IPAC)
      2.2.3. Principles of antimicrobial and diagnostic stewardship, including avoiding unnecessary testing and preventing potential toxic side effects
      2.2.4. Basic principles of research and critical appraisal

[1] The training in items 1.2, 1.3 and 1.4 must provide a broad experience with infections and their mimics in all systems and anatomic areas.
[2] The purpose of this experience is to provide the resident with an opportunity to be the first person to field calls, questions, and consultations from within the laboratory (e.g., medical laboratory technologists, etc.) as well as outside the laboratory before discussing or reviewing with a staff person. This can be completed as medical microbiology call during daytime hours or after-hours coverage of the medical microbiology service.

2.3. Critical appraisal activities, such as journal club
2.4. Attendance at educational rounds in the laboratory medicine department, as well as other relevant departments (e.g., Division of Infectious Diseases within the Department of Medicine)

Recommended training experiences (Foundations stage):

3. Clinical training experiences
   3.1. Medical microbiology laboratory
      3.1.1. Mycology
      3.1.2. Molecular microbiology
      3.1.3. Serology
      3.1.4. Virology

   3.2. Critical care unit
   3.3. Family medicine
   3.4. Pediatrics
   3.5. Subspecialties of internal medicine and/or pediatrics
   3.6. Any surgical service

4. Other training experiences
   4.1. Development of a proposal for a scholarly research, quality assurance, or educational project

Optional training experiences (Foundations stage):

5. Clinical training experiences
   5.1. Dermatology
   5.2. Obstetrics and gynecology
   5.3. Other diagnostic disciplines, examples include diagnostic radiology, medical biochemistry, and anatomic pathology

6. Other training experiences
   6.1. In-training examination

CORE OF DISCIPLINE (C)

In this stage, residents build on the skills and knowledge of the previous stages to participate in the full breadth of the discipline. This includes the full range of medical microbiology laboratory diagnostic services, as well as laboratory management. It also includes clinical consultation for adult and pediatric patients with any infectious disease presentation, and participation and consultation for IPAC and antimicrobial stewardship (AMS). In addition to their clinical responsibilities, residents will undertake scholarly projects and participate in teaching and clinical supervision of junior learners.

Required training experiences (Core stage):

1. Clinical training experiences
   1.1. Medical Microbiology
      1.1.1. Medical microbiology laboratory, in the breadth of the discipline, including bacteriology, mycobacteriology, mycology, parasitology, virology, molecular microbiology, and serology
      1.1.2. Laboratory management
      1.1.3. Public health reference laboratory
      1.1.4. IPAC
         1.1.4.1. Participation in multidisciplinary meetings
      1.1.5. Service providing AMS
         1.1.5.1. Participation in multidisciplinary meetings
      1.1.6. First call coverage for the medical microbiology service

   1.2. Infectious Diseases, in adult and pediatric populations
      1.2.1. Service providing consultation to critical care units, inpatient services, and the emergency department
      1.2.2. Clinic

2. Other training experiences
   2.1. Formal instruction in the clinical and biomedical sciences relevant to
      2.1.1. Clinical direction of the medical microbiology laboratory
      2.1.2. Quality management of the medical microbiology laboratory
      2.1.3. Clinical infectious diseases practice
      2.1.4. Principles, practice, and implementation of an IPAC program
      2.1.5. Principles, practice, and implementation of an AMS program
      2.1.6. Public health microbiology
      2.1.7. Teaching skills

   2.2. Attendance at educational rounds in the laboratory medicine department
   2.3. Critical appraisal activities, such as journal club
   2.4. Development and execution of a scholarly research, quality assurance, or educational project
   2.5. Provision of teaching for laboratory staff, junior learners, and peers
   2.6. In–training examination(s)

Recommended training experiences (Core stage):

3. Clinical training experiences
   3.1. Medical microbiology
      3.1.1. Medical microbiology laboratory receiving samples from the community
      3.1.2. Medical microbiology laboratory outside of the home institution

3.2. Infectious diseases
   3.2.1. Specialized clinics, such as human immunodeficiency virus (HIV), hepatitis, tuberculosis, sexually transmitted infections, outpatient antimicrobial therapy, and tropical and travel medicine
   3.2.2. Transplant infectious diseases consultation service and/or clinic
   3.2.3. Infectious diseases in a community setting
   3.2.4. After-hours coverage of the infectious diseases service

3.3. Other experience focusing on communicable disease control
3.4. Rotations in Public Health and Preventive Medicine
3.5. Individualized and/or enhanced skills acquisition related to individual interest or career plan

Optional training experiences (Core stage):

4. Other training experiences
   4.1. Simulation-based education particularly focused on procedural skills for sample collection; examples include lumbar puncture and incision and drainage

TRANSITION TO PRACTICE (TTP)

The focus of this stage is the consolidation of skills required for medical microbiology practice. During this stage residents have added responsibilities for clinical direction and management of the laboratory and will demonstrate leadership skills in all domains of practice, including running a clinical service, leading the day-to-day activities of the laboratory, and contributing their expertise to IPAC, AMS, and other relevant professional committees.

Required training experiences (TTP stage):

1. Clinical training experiences
   1.1. Medical microbiology laboratory, in any domain, in the role of junior attending[3]
   1.2. Service providing infectious diseases consultation to critical care areas, inpatient services, and the emergency department in the role of junior attending

2. Other training experiences
   2.1. Instruction in the following topics
      2.1.1. Emergency preparedness
      2.1.2. Administration of a medical microbiology laboratory
         2.1.2.1. Models of laboratory service delivery
         2.1.2.2. Total quality management
         2.1.2.3. Regulatory aspects of laboratory practice

[3] *"Junior attending" means that the resident assumes responsibility for patient care, and leadership in the education and clinical supervision of junior colleagues, with as much independence as permitted by ability, law, and hospital policy.*

2.1.2.4. Accreditation requirements

2.1.3. Leadership skills
2.1.4. Developing a business case
2.1.5. Continuing professional development requirements

2.2. Participation in medical microbiology laboratory committee meetings
2.3. Presentation of a completed scholarly research, quality assurance, or educational project
2.4. Career planning

Recommended training experiences (TTP stage):

3. Clinical training experiences
   3.1. After-hours coverage of the medical microbiology service
   3.2. After-hours coverage of the infectious diseases service
   3.3. Individualized and/or enhanced skills acquisition related to individual interest or career plan within the home institution or in other settings
   3.4. IPAC, AMS, or other relevant professional committees

4. Other training experiences
   4.1. Instruction in
      4.1.1. Practice management, including billing
      4.1.2. Teaching skills
      4.1.3. Conflict resolution

Optional training experiences (TTP stage):

5. Other training experiences
      5.1.1. In-training examination

CERTIFICATION REQUIREMENTS

Royal College certification in Medical Microbiology requires all of the following:

1. Successful completion of the Royal College examination in Medical Microbiology, and
2. Successful completion of the Royal College Medical Microbiology Portfolio.

NOTES:

The Medical Microbiology Portfolio refers to the list of entrustable professional activities (EPAs) across all four stages of the residency Competence Continuum and associated national standards for assessment and achievement.

Alternative Route to Certification

Individuals who intend to pursue concurrent or sequential training in Infectious Diseases (Adult or Peds) and Medical Microbiology may be eligible for an accelerated course of training leading to certification in both disciplines based on the achievement of competencies relevant to both disciplines. Assessments of the achievement of relevant competencies will be made on an individual basis by the respective program directors and the associated postgraduate medical education office, following the principles of the Royal College Credentials policy for Competence by Design.

Guidance for residents and programs regarding combined certification in Infectious Diseases and Medical Microbiology

1. It is strongly recommended that residents who intend to pursue training in both Medical Microbiology and Infectious Diseases identify this as early as possible in their Internal Medicine, Pediatrics, or Infectious Diseases training. It is the responsibility of the resident to contact the program directors of both the Infectious Diseases and Medical Microbiology programs to declare their intention and discuss how to tailor their training.
2. The Specialty Committee in Medical Microbiology has identified that the entrustable professional activities and associated competencies of Medical Microbiology at the Transition to Discipline and Foundations stage related to general clinical care will have been achieved in the entry discipline of Internal Medicine or Pediatrics. This includes the EPAs related to
    a. Assessing patients and synthesizing information for presentation to a supervisor
    b. Following IPAC precautions
    c. Recognizing the acuity of a patient's illness, and initiating stabilization and management
    d. Assessing and providing initial management for patients with acute presentations of common illnesses
    e. Providing ongoing care for patients with common conditions and advancing their care plans
    f. Communicating clinical findings and management plans to patients and families
    g. Providing handover
    h. Working effectively as a member of the interprofessional team

3. The Specialty Committee in Medical Microbiology has identified that the entrustable professional activities and associated competencies of Infectious Diseases training related to providing consultation and ongoing care for patients with common infections and complex and/or chronic infectious disease presentations, outpatient consultations, and immunization and prophylaxis consultations, as well as clinical documentation and managing the consult service will be or will have been achieved in Infectious Diseases training. This includes the EPAs related to
    a. Assessing immunocompetent patients and initiating management for common infections
    b. Providing ongoing care for immunocompetent patients with a common infection
    c. Assessing inpatients with a complex and/or chronic infectious disease presentation and initiating management
    d. Providing ongoing care for inpatients with a complex and/or chronic infectious disease
    e. Providing consultation and ongoing care in the outpatient setting

f. Providing immunization and prophylaxis consultations
g. Managing an outpatient clinic
h. Providing formal teaching for a variety of audiences

4. Relevant professional activities and training experiences completed in the entry discipline (Internal Medicine or Pediatrics) or during Infectious Diseases training will be reviewed on an individual basis by the Medical Microbiology program and the postgraduate medical education office and may be credited towards achievement of competence in Medical Microbiology.
5. Achievement of competence may be demonstrated with an individually-tailored assessment plan, since it may not be feasible for these trainees to undergo the number of observations mandated in the current iteration of the EPAs.

MODEL DURATION OF TRAINING

Progress in training occurs through demonstration of competence and advancement through the stages of the Competence Continuum. Medical Microbiology is planned as a 5-year residency program. There is no mandated period of training in each stage. Individual duration of training may be influenced by many factors, which may include the resident's singular progression through the stages, the availability of teaching and learning resources, and/or differences in program implementation. Duration of training in each stage is therefore at the discretion of the faculty of medicine, the competence committee, and the program director.

Guidance for programs

The Royal College Specialty Committee in Medical Microbiology's suggested course of training, for the purposes of planning learning experiences and schedules, is as follows:

2-4 blocks in Transition to Discipline*

12-22 blocks in Foundations of Discipline

24-36 blocks in Core of Discipline

6-9 blocks in Transition to Practice

Guidance for postgraduate medical education offices

The stages of the Competence Continuum in Medical Microbiology are generally no longer than

4 blocks for Transition to Discipline

22 blocks for Foundations of Discipline

36 blocks for Core of Discipline

9 blocks for Transition to Practice

Total duration of training – 5 years

**One block is equal to four weeks.*

This document is to be reviewed by the Specialty Committee in Medical Microbiology by JANUARY 31, 2026.

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