



Standards of Accreditation for Residency Programs in Medical Microbiology

The *Standards of Accreditation for Residency Programs in Medical Microbiology* are a national set of standards maintained by the Royal College for the evaluation and accreditation of *Medical Microbiology* residency programs. The standards aim to ensure the quality of residency education provided across Canada, and ensure *Medical Microbiology* residency programs adequately prepare residents to meet the health care needs of their patient population(s), during and upon completion of training.

The standards include expectations specific to the discipline, as well as the expectations set out in the *General Standards of Accreditation for Residency Programs*, which are applicable to all residency programs. In instances where the indicators reflected in the *General Standards of Accreditation for Residency Programs* have been modified within this document to reflect a discipline-specific expectation, the indicator as reflected in this document takes precedence. The standards are intended to be read in conjunction with the national discipline-specific documents for *Medical Microbiology*.

Standards Organization Framework

Level	Description
Domain	Domains, defined by the Future of Medical Education in Canada-Postgraduate (FMEC-PG) Accreditation Implementation Committee, introduce common organizational terminology to facilitate alignment of accreditation standards across the medical education continuum.
Standard	The overarching outcome to be achieved through the fulfillment of the associated requirements.
Element	A category of the requirements associated with the overarching standard.
Requirement	A measurable component of a standard.
Mandatory and exemplary indicators	<p>A specific expectation used to evaluate compliance with a requirement (i.e. to demonstrate that the requirement is in place).</p> <p>Mandatory indicators must be met to achieve full compliance with a requirement.</p> <p>Exemplary indicators provide objectives beyond the mandatory expectations and may be used to introduce indicators that will become mandatory over time.</p> <p>Indicators may have one or more sources of evidence, not all of which will be collected through the onsite accreditation review (e.g. evidence may be collected via the institution/program profile in the CanAMS).</p>

Domain: Program Organization

Standard 1: There is an appropriate organizational structure, with leadership and administrative personnel to support the residency program, teachers, and residents effectively.

Element 1.1: The program director leads the residency program effectively.

Requirement 1.1.1: The program director is available to oversee and advance the residency program.

Indicator 1.1.1.1: The program director has adequate protected time to oversee and advance the residency program consistent with the postgraduate office guidelines and in consideration of the size and complexity of the program.

Indicator 1.1.1.2: The program director is accessible and responsive to the input, needs, and concerns of residents.

Indicator 1.1.1.3: The program director is accessible and responsive to the input, needs, and concerns of teachers and members of the residency program committee.

Requirement 1.1.2: The program director has appropriate support to oversee and advance the residency program.

Indicator 1.1.2.1: The faculty of medicine, postgraduate office, and academic lead of the discipline provide the program director with sufficient support, autonomy, and resources for the effective operation of the residency program.

Indicator 1.1.2.2: Administrative support is organized and adequate to support the program director, the residency program, and residents.

Requirement 1.1.3: The program director provides effective leadership for the residency program.

Indicator 1.1.3.1: The program director fosters an environment that empowers members of the residency program committee, residents, teachers, and others as required to identify needs and implement changes.

Indicator 1.1.3.2: The program director advocates for equitable, appropriate, and effective educational experiences.

Indicator 1.1.3.3: The program director communicates with residency program stakeholders effectively.

Indicator 1.1.3.4: The program director anticipates and manages conflict effectively.

Indicator 1.1.3.5: The program director respects the diversity and protects the rights and confidentiality of residents and teachers.

Indicator 1.1.3.6: The program director demonstrates active participation in professional development in medical education.

Indicator 1.1.3.7 [Exemplary]: *The program director demonstrates a commitment to and facilitates educational scholarship and innovation to advance the residency program.*

Indicator 1.1.3.8 [Royal College Requirement]: The program director or delegate attends at least one specialty committee meeting per year in person or remotely.

Element 1.2: There is an effective and functional residency program committee structure to support the program director in planning, organizing, evaluating, and advancing the residency program.

Requirement 1.2.1: The residency program committee structure is composed of appropriate key residency program stakeholders.

Indicator 1.2.1.1: Major academic and clinical components and relevant learning sites are represented on the residency program committee.

Indicator 1.2.1.2: There is an effective, fair and transparent process for residents to select their representatives on the residency program committee.

Indicator 1.2.1.3: There is an effective process for individuals involved in resident wellness and safety program/plans to provide input to the residency program committee.

Indicator 1.2.1.4 [Exemplary]: There is an effective process for individuals responsible for the quality of care and patient safety at learning sites to provide input to the residency program committee.

Requirement 1.2.2: The residency program committee has a clear mandate to manage and evaluate the key functions of the residency program.

Indicator 1.2.2.1: There are clearly written terms of reference that address the composition, mandate, roles, and responsibilities of each member; accountability structures; decision-making processes; lines of communication; and meeting procedures.

Indicator 1.2.2.2: The terms of reference for the residency program committee are reviewed on a regular basis, and are refined as appropriate.

Indicator 1.2.2.3: The mandate of the residency program committee includes planning and organizing the residency program, including selection of residents, educational design, policy and process development, safety, resident wellness, assessment of resident progress, and continuous improvement.

Indicator 1.2.2.4: Meeting frequency of the residency program committee is sufficient to fulfil its mandate.

Indicator 1.2.2.5: The residency program committee structure includes a competence committee (or equivalent) responsible for reviewing residents' readiness for increasing professional responsibility, promotion, and transition to practice.

Requirement 1.2.3: There is an effective and transparent decision-making process that includes input from residents and other residency program stakeholders.

Indicator 1.2.3.1: Members of the residency program committee are actively involved in a collaborative decision-making process, including regular attendance at and active participation in committee meetings.

Indicator 1.2.3.2: The residency program committee actively seeks feedback from residency program stakeholders, discusses issues, develops action plans and follows up on identified issues.

Indicator 1.2.3.3: There is a culture of respect for residents' opinions by the residency program committee.

Indicator 1.2.3.4: Actions and decisions are communicated in a timely manner to the residency program's residents, teachers, and administrative personnel, and to the academic lead of the discipline and others responsible for the delivery of the residency program, as appropriate.

Standard 2: All aspects of the residency program are collaboratively overseen by the program director and the residency program committee.

Element 2.1: Effective policies and processes to manage residency education are developed and maintained.

Requirement 2.1.1: The residency program committee has well-defined, transparent, and functional policies and processes to manage residency education.

Indicator 2.1.1.1: There is an effective mechanism to review and adopt applicable postgraduate office and learning site policies and processes.

Indicator 2.1.1.2: There is an effective, transparent mechanism to collaboratively develop and adopt required program- and discipline-specific policies and processes.

Indicator 2.1.1.3: There is an effective mechanism to disseminate the residency program's policies and processes to residents, teachers, and administrative personnel.

Indicator 2.1.1.4: All individuals with responsibility in the residency program follow the central policies and procedures regarding ensuring appropriate identification and management of conflicts of interest.

Element 2.2: The program director and residency program committee communicate and collaborate with residency program stakeholders.

Requirement 2.2.1: There are effective mechanisms to collaborate with the division/department, other programs, and the postgraduate office.

Indicator 2.2.1.1: There is effective communication between the residency program and the postgraduate office.

Indicator 2.2.1.2: There are effective mechanisms for the residency program to share information and collaborate with the division/department, as appropriate, particularly with respect to resources and capacity.

Indicator 2.2.1.3: There is collaboration with the faculty of medicine's undergraduate medical education program and with continuing professional development programs, including faculty development, as appropriate.

Indicator 2.2.1.4 [Exemplary]: *There is collaboration with other health professions to provide shared educational experiences for learners across the spectrum of health professions.*

Element 2.3: Resources and learning sites are organized to meet the requirements of the discipline.

Requirement 2.3.1: There is a well-defined and effective process to select the residency program's learning sites.

Indicator 2.3.1.1: There is an effective process to select, organize, and review the residency program's learning sites based on the required educational experiences, and in accordance with the central policy(ies) for learning site agreements.

Indicator 2.3.1.2: Where the faculty of medicine's learning sites are unable to provide all educational requirements, the residency program committee, in collaboration with the postgraduate office, recommends and helps establish inter-institution affiliation (IIA) agreement(s) to ensure residents acquire the necessary competencies.

Requirement 2.3.2: Each learning site has an effective organizational structure to facilitate education and communication.

Indicator 2.3.2.1 (modified): Each learning site, including electives, has a site coordinator/supervisor responsible to the residency program committee.

Indicator 2.3.2.2: There is effective communication and collaboration between the residency program committee and the site coordinators/supervisors for each learning site to ensure program policies and procedures are followed.

Indicator 2.3.2.3: Community-based learning sites utilized by the program provide a learning environment with appropriate administrative support and linkages with the university.

Indicator 2.3.2.4: The directors of the residency program's microbiology laboratories are responsible for the conduct of the training program at the learning site.

Indicator 2.3.2.5: The directors of the residency program's microbiology laboratories have university appointments in the appropriate department in the medical school.

Requirement 2.3.3: The residency program committee engages in operational and resource planning to support residency education.

Indicator 2.3.3.1: There is an effective process to identify, advocate for, and plan for resources needed by the residency program.

Indicator 2.3.3.2: The residency program committee works together with the site coordinator/supervisor and the director of the microbiology laboratory at each learning site to provide sufficient resources for the residency program.

Domain: Education Program

Standard 3: Residents are prepared for independent practice.

Element 3.1: The residency program's educational design is based on outcomes-based competencies and/or objectives that prepare residents to meet the needs of the population(s) they will serve in independent practice.

Requirement 3.1.1: Educational competencies and/or objectives are in place that ensure residents progressively meet all required standards for the discipline and address societal needs.

Indicator 3.1.1.1 (modified): The educational objectives meet the specialty-specific requirements for Medical Microbiology, as outlined in the Objectives of Training and the Specialty Training Requirements in Medical Microbiology.

Indicator 3.1.1.2: The competencies and/or objectives address each of the Roles in the CanMEDS/CanMEDS-FM Framework specific to the discipline.

Indicator 3.1.1.3: The competencies and/or objectives articulate different expectations for residents by stage and/or level of training.

Indicator 3.1.1.4: Community and societal needs are considered in the design of the residency program's competencies and/or objectives.

Element 3.2: The residency program provides educational experiences designed to facilitate residents' attainment of the outcomes-based competencies and/or objectives.

Requirement 3.2.1: Educational experiences are guided by competencies and/or objectives, and provide residents with opportunities for increasing professional responsibility at each stage or level of training.

Indicator 3.2.1.1: The educational experiences are defined specifically for and/or are mapped to the competencies and/or objectives.

Indicator 3.2.1.2 (modified): The educational experiences meet the specialty-specific requirements as outlined in the Objectives of Training and the Specialty Training Requirements in Medical Microbiology.

Indicator 3.2.1.3 (modified): The educational experiences and supervision are appropriate for residents' stage or level of training, and support residents' achievement of increasing professional responsibility to the level of independent practice, including the interpretive and technical skills that relate to the specialty, as well as the provision of clinical consultations and the management of microbiological laboratories.

Indicator 3.2.1.4: The educational experiences include opportunities for residents to develop expertise in each of the following areas:

- scientific development and administrative and clinical direction of a clinical microbiology laboratory;

- clinical consultations, in both inpatient and outpatient settings, on the investigation, diagnosis, treatment, and prevention of infectious diseases;
- infection prevention and control and antimicrobial stewardship; and
- epidemiology of communicable diseases.

Indicator 3.2.1.5: The educational experiences provide opportunities for residents to act as a consultant to healthcare providers and laboratory colleagues.

Indicator 3.2.1.6: The educational experiences include resident participation in consultations, both elective and emergency, inpatient and outpatient, adult and pediatric, on a continuous basis throughout training.

Indicator 3.2.1.7 [Exemplary]: *The educational experiences include a longitudinal experience for the resident.*

Indicator 3.2.1.8 [Exemplary]: *The educational experiences include opportunities for community-based learning, such as a rotation in a regional hospital or community diagnostic microbiology laboratory.*

Indicator 3.2.1.9: During laboratory rotations, residents are trained to work proactively with their colleagues, whom they assist in their activities related to the diagnosis and management of patients and the prevention of infections.

Indicator 3.2.1.10: The educational experiences include appropriate opportunity for residents to gain experience in the area of hospital infection prevention and control and antimicrobial stewardship, and to attend meetings of these committees.

Indicator 3.2.1.11 [Exemplary]: *The educational experiences include opportunities for residents to participate in all components of hospital infection prevention and control and antimicrobial stewardship.*

Requirement 3.2.2: The residency program uses a comprehensive curriculum plan, which is specific to the discipline, and addresses all the CanMEDS/CanMEDS-FM Roles.

Indicator 3.2.2.1: There is a clear curriculum plan that describes the educational experiences for residents.

Indicator 3.2.2.2: The curriculum plan incorporates all required educational objectives or key and enabling competencies of the discipline.

Indicator 3.2.2.3: The curriculum plan addresses expert instruction and experiential learning opportunities for each of the CanMEDS/CanMEDS-FM Roles with a variety of suitable learning activities.

Indicator 3.2.2.4: The curriculum plan includes training in continuous improvement, with emphasis on improving systems of patient care, including patient safety, with opportunities for residents to apply their training in a project or clinical setting.

Indicator 3.2.2.5: The curriculum plan includes fatigue risk management, specifically, education addressing the risks posed by fatigue to the practice setting, and the individual and team-based strategies available to manage the risk.

Indicator 3.2.2.6: The curriculum plan includes a central program in the basic science of microbiology and systematic teaching in Medical Microbiology¹ (Medical Expert).

¹ It is recommended that this involve course work and directed reading in epidemiology, pathogenesis, microbial structure, host response to infection, genetics, diagnosis, treatment, and prevention of infectious disease; as well as general medicine and surgery, sufficient to allow effective communication with colleagues in all specialties.

Indicator 3.2.2.7: The curriculum plan includes opportunities for residents to acquire competence in management related to the laboratory (quality improvement, safety), and infection prevention and control and antimicrobial stewardship (Leader).

Indicator 3.2.2.8: The curriculum plan includes opportunities for residents to educate physicians and other members of the hospital staff in microbiology and infectious diseases in informal seminars, ward rounds, and formal lectures (Scholar).

Indicator 3.2.2.9: The curriculum plan includes opportunities to participate in research or quality improvement projects under the supervision of appropriate investigators (Scholar).

Indicator 3.2.2.10 [Exemplary]: *The curriculum plan details how the responsibility for each of the components of the residency program is shared by participating learning sites.*

Requirement 3.2.3: The educational design allows residents to identify and address individual learning objectives.

Indicator 3.2.3.1: Individual residents' educational experiences are tailored to accommodate their learning needs and future career aspirations, while meeting the national standards and societal needs for their discipline.

Indicator 3.2.3.2: The residency program fosters a culture of reflective practice and lifelong learning among its residents.

Requirement 3.2.4: Residents' clinical responsibilities are assigned in a way that supports the progressive acquisition of competencies and/or objectives, as outlined in the CanMEDS/CanMEDS-FM Roles.

Indicator 3.2.4.1: Residents' clinical responsibilities are assigned based on level or stage of training and their individual level of competence.

Indicator 3.2.4.2: Residents' clinical responsibilities, including on-call duties, provide opportunities for progressive experiential learning, in accordance with all CanMEDS/CanMEDS-FM Roles.

Indicator 3.2.4.3: Residents are assigned to particular educational experiences in an equitable manner, such that all residents have opportunities to meet their educational needs and to achieve the expected competencies of the residency program.

Indicator 3.2.4.4: Residents' clinical responsibilities do not interfere with their ability to participate in mandatory academic activities.

Requirement 3.2.5: The educational environment supports and promotes resident learning in an atmosphere of scholarly inquiry.

Indicator 3.2.5.1: Residents have access to, and mentorship for, a variety of scholarly opportunities, including research as appropriate.

Indicator 3.2.5.2: Residents have protected time to participate in scholarly activities, including research as appropriate.

Indicator 3.2.5.3: Residents have protected time to participate in professional development to augment their learning and/or to present their scholarly work.

Element 3.3: Teachers facilitate residents' attainment of competencies and/or objectives.

Requirement 3.3.1: Resident learning needs, stage or level of training, and other relevant factors are used to guide all teaching, supporting resident attainment of competencies and/or objectives.

Indicator 3.3.1.1: Teachers use experience-specific competencies and/or objectives to guide educational interactions with residents.

Indicator 3.3.1.2: Teachers align their teaching appropriately with residents' stage or level of training, and individual learning needs and objectives.

Indicator 3.3.1.3: Teachers contribute to the promotion and maintenance of a positive learning environment.

Indicator 3.3.1.4: Residents' feedback to teachers facilitates the adjustment of teaching approaches and learner assignment, as appropriate, to maximize the educational experiences.

Element 3.4: There is an effective, organized system of resident assessment.

Requirement 3.4.1: The residency program has a planned, defined, and implemented system of assessment.

Indicator 3.4.1.1: The system of assessment is based on residents' attainment of experience-specific competencies and/or objectives.

Indicator 3.4.1.2: The system of assessment clearly identifies the methods by which residents are assessed for each educational experience.

Indicator 3.4.1.3: The system of assessment clearly identifies the level of performance expected of residents based on level or stage of training.

Indicator 3.4.1.4: The system of assessment includes identification and use of appropriate assessment tools tailored to the residency program's educational experiences, with an emphasis on direct observation where appropriate.

Indicator 3.4.1.5: The system of assessment meets the requirements within the specific standards for the discipline, including the achievement of competencies in all CanMEDS roles or CFPC evaluation objectives, as applicable.

Indicator 3.4.1.6: The system of assessment is based on multiple assessments of residents' competencies during the various educational experiences and over time, by multiple assessors, in multiple contexts.

Indicator 3.4.1.7: Teachers are aware of the expectations for resident performance based on level or stage of training and use these expectations in their assessments of residents.

Indicator 3.4.1.8: The system of assessment includes a formal review process completed annually of all PGY2-5 Medical Microbiology residents, with written, oral, clinical, and/or practical components.

Indicator 3.4.1.9 [Exemplary]: *The system of assessment requires each of the following components to be performed at least twice during the residency training prior to completion of the final in-training evaluation report:*

- *observation of clinical skills (history and physical examination); and*
- *assessment of Medical Expert skills, including laboratory and procedural skills as outlined in the Objectives of Training for Medical Microbiology.*

Requirement 3.4.2: There is a mechanism in place to engage residents in regular discussions for review of their performance and progression.

Indicator 3.4.2.1: Residents receive regular, timely, meaningful, in-person feedback on their performance.

Indicator 3.4.2.2: The program director and/or an appropriate delegate meet(s) regularly with residents to discuss and review their performance and progress.

Indicator 3.4.2.3: There is appropriate documentation of residents' progress toward the attainment of competencies, which is available to the residents in a timely manner.

Indicator 3.4.2.4: Residents are aware of the processes for assessment and decisions around promotion and completion of training.

Indicator 3.4.2.5: The residency program fosters an environment where formative feedback is actively used by residents to guide their learning.

Indicator 3.4.2.6: Residents and teachers have shared responsibility for recording residents' learning and achievement of competencies and/or objectives for their discipline at each level or stage of training.

Requirement 3.4.3: There is a well-articulated process for decision-making regarding resident progression, including the decision on satisfactory completion of training.

Indicator 3.4.3.1: The competence committee (or equivalent) regularly reviews residents' readiness for increasing professional responsibility, promotion, and transition to practice, based on demonstrated achievement of expected competencies and/or objectives for each level or stage of training.

Indicator 3.4.3.2: The competence committee (or equivalent) makes a summative assessment regarding residents' readiness for certification and independent practice, as appropriate.

Indicator 3.4.3.3: The program director provides the respective College with the required summative documents for exam eligibility and for each resident who has successfully completed the residency program.

Indicator 3.4.3.4 [Exemplary]: *The competence committee (or equivalent) uses advanced assessment methodologies (e.g., learning analytics, narrative analysis) to inform recommendations/decisions, as appropriate, on resident progress.*

Requirement 3.4.4: The system of assessment allows for timely identification of and support for residents who are not attaining the required competencies or objectives as expected.

Indicator 3.4.4.1: Residents are informed in a timely manner of any concerns regarding their performance and/or progression.

Indicator 3.4.4.2: Residents who are not progressing as expected are provided with the required support and opportunity to improve their performance, as appropriate.

Indicator 3.4.4.3: Any resident requiring formal remediation and/or additional educational experiences, is provided with:

- a documented plan detailing objectives of the formal remediation and their rationale;
- the educational experiences scheduled to allow the resident to achieve these objectives;
- the assessment methods to be employed;
- the potential outcomes and consequences;
- the methods by which a final decision will be made as to whether the resident has successfully completed a period of formal remediation; and
- the appeal process.

Domain: Resources

Standard 4: The delivery and administration of the residency program are supported by appropriate resources.

Element 4.1: The residency program has the clinical, physical, technological, and financial resources to provide all residents with the educational experiences needed to acquire all competencies and/or objectives.

Requirement 4.1.1: The patient population is adequate to ensure that residents experience the breadth of the discipline.

Indicator 4.1.1.1: The residency program provides access to the volume and diversity of patients appropriate to the discipline.

Indicator 4.1.1.2: The residency program provides access to diverse patient populations and environments, in alignment with the community and societal needs for the discipline.

Indicator 4.1.1.3: The volume and diversity of patients and specimens available to the residency program are sufficient to:

- ensure full training for each resident in all areas of Medical Microbiology; and
- support residents' acquisition of knowledge, skills, and attitudes relating to population aspects of age, gender, culture, and ethnicity, appropriate to Medical Microbiology.

Requirement 4.1.2: Clinical and consultative services and facilities are organized and adequate to ensure that residents experience the breadth of the discipline.

Indicator 4.1.2.1 (modified): The residency program has access to the diversity of learning sites and scopes of practice to ensure full training for each resident in all areas of Medical Microbiology.

Indicator 4.1.2.2: The residency program has access to appropriate consultative services to meet the general and specific standards for the discipline.

Indicator 4.1.2.3 (modified): The residency program has access to appropriate diagnostic services and laboratory services to ensure full training for each resident in all areas of Medical Microbiology, and the delivery of quality care.

Indicator 4.1.2.4: Resident training takes place in functionally inter- and intra-professional learning environments that prepare residents for collaborative practice.

Indicator 4.1.2.5: The residency program provides access to consultations in Medical Microbiology training, Infectious Diseases training, and other clinical training, to ensure appropriate training in all aspects of investigation, diagnosis, treatment, and prevention of infectious diseases.

Indicator 4.1.2.6: The residency program has access to an active infectious diseases consultation service.

Indicator 4.1.2.7: The residency program has access to sufficient clinical consultation resources, including a sufficient volume and variety of patients to ensure residents develop the ability to:

- act as a consultant to clinical and laboratory colleagues on the selection and interpretation of appropriate tests and the treatment and prevention of microbial disease; and
- provide competent formal written consultations in cases of infection.

Indicator 4.1.2.8: The residency program has access to sufficient human and physical resources for a rotation in Infection Prevention and Control that is directly supervised by a specialist with qualifications acceptable to the program director.

Indicator 4.1.2.9: The residency program provides opportunities for the resident to gain experience in the area of hospital infection prevention and control and antimicrobial stewardship, and to attend meetings of the relevant committees.¹

¹ The resident should actively participate in all components of these programs.

Indicator 4.1.2.10: The residency program liaises with teaching services in Internal Medicine, General Surgery, Obstetrics and Gynecology, Pediatrics, and other laboratory specialties.

Indicator 4.1.2.11: The residency program has a definite mechanism within the faculty to ensure that training provided meets the needs of residents in Medical Microbiology.

Indicator 4.1.2.12: The residency program has access to adequate university teachers with expertise and availability of human resources for training in epidemiology of communicable disease, immunization, basic biostatistics, and ethics.

Indicator 4.1.2.13: The residency program has access to sufficient resources, including volume and variety of specimens and patients; laboratory space, equipment, and services; and teaching and medical staff, to provide the General Medical Microbiology component of the program. This includes but is not limited to:

- full training in microbiological techniques, the reporting and interpretation of test results, infection prevention and control, and clinical laboratory consultations;
- experience in the essential components of the laboratory training program: bacteriology, mycobacteriology, mycology, parasitology, virology/serology, molecular epidemiologic and diagnostic methods, and antimicrobial agent susceptibility testing;
- full training in the microbiology of acute and chronic cases in both adult and pediatric, medicine and surgery; and
- experience (or arrangements are made to provide exposure) to areas of microbiology which have traditionally been carried out in reference laboratories, such as: syphilis, serology, molecular fingerprinting, enteric reference bacteriology and environmental testing and surveillance.

Indicator 4.1.2.14: The residency program has access to sufficient resources, including volume and variety of specimens and patients; laboratory space, equipment, and services; and teaching and medical staff, to provide the Laboratory Management component of the program. This includes but is not limited to:

- instruction in laboratory management and experience in the procedures essential to the operation of a full service diagnostic laboratory, including quality improvement, laboratory safety and biosecurity, media preparation, and maintenance of equipment.

Indicator 4.1.2.15: The residency program has access to sufficient resources, including volume and variety of specimens and patients; laboratory space, equipment, and services; and teaching and medical staff, to provide the Pediatric Medical Microbiology component of the program. This includes but is not limited to:

- training in medical microbiology and infectious diseases in the neonatal and pediatric age group.

Indicator 4.1.2.16: The residency program's laboratory facilities are supported by sufficient laboratory human resources, to ensure experienced medical technologists are available to participate in the laboratory training of the residents.

Indicator 4.1.2.17 [Exemplary]: *The residency program's laboratory facilities include microscopy and immunodiagnostics, and specialized equipment relevant to these areas.*

Indicator 4.1.2.18 [Exemplary]: *The residency program has access to sufficient resources to provide residents with experience in the area of information technology, developing competence in data collection, analysis, and presentation, as well as familiarization with the organizational structure of laboratory information systems.*

Indicator 4.1.2.19 [Exemplary]: *The residency program has access to sufficient human resources for residents to obtain experience in the areas of budget preparation and planning for the implementation of new laboratory procedures and programs, and in their subsequent evaluation.*

Indicator 4.1.2.20: The residency program liaises, as appropriate, with teaching services in Internal Medicine, General Surgery, Obstetrics and Gynecology, Pediatrics, and other laboratory specialties, and there are definite mechanisms to ensure that the associated training provided meets the needs of residents in Medical Microbiology.

Indicator 4.1.2.21: The university sponsors an accredited program in Internal Medicine and in Pediatrics.

Requirement 4.1.3: The residency program has the necessary financial, physical, and technical resources.

Indicator 4.1.3.1: There are adequate financial resources for the residency program to meet the general and specific standards for the discipline.

Indicator 4.1.3.2: There is adequate space for the residency program to meet educational requirements.

Indicator 4.1.3.3: There are adequate technical resources for the residency program to meet the specific requirements for the discipline.

Indicator 4.1.3.4: Residents have appropriate access to adequate facilities and services to conduct their work, including on-call rooms, workspaces, internet, and patient records.

Indicator 4.1.3.5: The program director, residency program committee, and administrative personnel have access to adequate space, information technology, and financial support to carry out their duties.

Element 4.2: The residency program has the appropriate human resources to provide all residents with the required educational experiences.

Requirement 4.2.1: Teachers appropriately implement the residency curriculum, supervise and assess trainees, contribute to the program, and role model effective practice.

Indicator 4.2.1.1 (modified): The number, credentials, and competencies of the teachers are adequate to provide the required clinical teaching, academic teaching, supervision, assessment, and feedback to residents, including teaching in the basic and clinical sciences related to Medical Microbiology in adult and pediatrics.

Indicator 4.2.1.2 (modified): The number, credentials, and competencies of the teachers are adequate to supervise residents in all clinical environments, including when residents are on-call and when providing care to patients, as part of the residency program, outside of a learning site.¹

¹ While it is recommended that there be a sufficient number of qualified Medical Microbiologists to supervise residents for clinical laboratory consultations during regular work hours and on-call, in certain circumstances, as approved by the program director, the laboratory component may be provided by a qualified Clinical Microbiologist and the patient/infection control management component may be provided by an Infectious Diseases physician.

Indicator 4.2.1.3: There are sufficient competent individual supervisors to support a variety of resident scholarly activities, including research as appropriate.

Indicator 4.2.1.4: There is a designated individual who facilitates the involvement of residents in scholarly activities, including research as appropriate, and who reports to the residency program committee.

Indicator 4.2.1.5: The program director has a university appointment.¹

¹ The Royal College is informed by the postgraduate office when a new program director is appointed.

Indicator 4.2.1.6: The residency program has access to adequate teaching resources within the university, with respect to both expertise and availability of human resources, for training in the epidemiology of communicable diseases, immunization, basic biostatistics, and ethics.

Indicator 4.2.1.7: The program director has Royal College certification in Medical Microbiology, or is a medical graduate with equivalent qualifications acceptable to the Royal College Medical Microbiology Specialty Committee.

Indicator 4.2.1.8 [Exemplary]: *Each Medical Microbiology resident in the final two years of training has a Medical Microbiologist at a one-to-one ratio who is directly involved in the training of the residents.*

Domain: Learners, Teachers, and Administrative Personnel

Standard 5: Safety and wellness is promoted throughout the learning environment.

Element 5.1: The safety and wellness of patients and residents are actively promoted.

Requirement 5.1.1: Residents are appropriately supervised.

Indicator 5.1.1.1: Residents and teachers follow central policies and any program-specific policies regarding the supervision of residents, including ensuring the physical presence of the appropriate supervisor, when mandated, during acts or procedures performed by the resident, and ensuring supervision is appropriate for the level or stage of training.

Indicator 5.1.1.2: Teachers are available for consultation for decisions related to patient care in a timely manner.

Indicator 5.1.1.3: Teachers follow the policies and processes for disclosure of resident involvement in patient care, and for patient consent for such participation.

Requirement 5.1.2: Residency education occurs in a safe learning environment.

Indicator 5.1.2.1: Safety is actively promoted throughout the learning environment for all those involved in the residency program.

Indicator 5.1.2.2: Effective resident safety policies and processes are in place, which may include policies and processes defined centrally or specific to the program, and which reflect general and/or discipline-specific physical, psychological, and professional resident safety concerns, as appropriate. The policies and processes include, but are not limited to:

- After-hours consultation
- Complaints and allegations of malpractice
- Fatigue risk management
- Hazardous materials
- Infectious agents
- Ionizing radiation
- Patient encounters (including house calls)
- Patient transfers (e.g., Medevac)
- Safe disclosure of patient safety incidents
- Travel
- Violence, including sexual and gender-based violence.

Indicator 5.1.2.3: Policies regarding resident safety effectively address both situations and perceptions of lack of resident safety, and provide multiple avenues of access for effective reporting and management.

Indicator 5.1.2.4: Concerns with the safety of the learning environment are appropriately identified and remediated.

Indicator 5.1.2.5: Residents are supported and encouraged to exercise discretion and judgment regarding their personal safety, including fatigue.

Indicator 5.1.2.6: Residents and teachers are aware of the process to follow if they perceive safety issues.

Requirement 5.1.3: Residency education occurs in a positive learning environment that promotes resident wellness.

Indicator 5.1.3.1: There is a positive and respectful learning environment for all involved in the residency program.

Indicator 5.1.3.2: Residents are aware of and are able to access appropriate, confidential wellness support to address physical, psychological, and professional resident wellness concerns.

Indicator 5.1.3.3: The central policies and processes regarding resident absences and educational accommodation are applied effectively.

Indicator 5.1.3.4: The processes regarding identification, reporting, and follow-up of resident mistreatment are applied effectively.

Indicator 5.1.3.5: Residents are supported and encouraged to exercise discretion and judgment regarding their personal wellness.

Standard 6: Residents are treated fairly and supported adequately throughout their progression through the residency program.

Element 6.1: The progression of residents through the residency program is supported, fair, and transparent.

Requirement 6.1.1: There are effective, clearly defined, transparent, formal processes for the selection and progression of residents.

Indicator 6.1.1.1: Processes for resident selection, promotion, remediation, dismissal, and appeals are applied effectively, transparent, and aligned with applicable central policies.

Indicator 6.1.1.2: The residency program encourages and recognizes resident leadership.

Requirement 6.1.2: Support services are available to facilitate resident achievement of success.

Indicator 6.1.2.1: The residency program provides formal, timely career planning and counseling to residents throughout their progress through the residency program.

Standard 7: Teachers deliver and support all aspects of the residency program effectively.

Element 7.1: Teachers are assessed, recognized, and supported in their development as positive role models for residents in the residency program.

Requirement 7.1.1: Teachers are regularly assessed and supported in their development.

Indicator 7.1.1.1: There is an effective process for the assessment of teachers involved in the residency program, aligned with applicable central processes, that balances timely feedback with preserving resident confidentiality.

Indicator 7.1.1.2: The system of teacher assessment ensures recognition of excellence in teaching, and is used to address performance concerns.

Indicator 7.1.1.3: Resident input is a component of the system of teacher assessment.

Indicator 7.1.1.4: Faculty development for teaching that is relevant and accessible to the program is offered on a regular basis.

Indicator 7.1.1.5: There is an effective process to identify, document, and address unprofessional behaviour by teachers.

Indicator 7.1.1.6: The residency program identifies and addresses priorities for faculty development within residency training.

Requirement 7.1.2: Teachers in the residency program are effective role models for residents.

Indicator 7.1.2.1: Teachers exercise the dual responsibility of providing high quality and ethical patient care, and excellent supervision and teaching.

Indicator 7.1.2.2: Teachers contribute to academic activities of the residency program and institution, which may include, but are not limited to: lectures, workshops, examination preparation, and internal reviews.

Indicator 7.1.2.3: Teachers are supported and recognized for their contributions outside the residency program, which may include, but are not limited to: peer reviews, medical licensing authorities, exam boards, specialty committees, accreditation committees, specialty societies, and government medical advisory boards.

Indicator 7.1.2.4: Teachers contribute to scholarship on an ongoing basis.

Standard 8: Administrative personnel are valued and supported in the delivery of the residency program.

Element 8.1: There is support for the continuing professional development of residency program administrative personnel.

Requirement 8.1.1: There is an effective process for the professional development of the residency program administrative personnel.

Indicator 8.1.1.1: There is a role description that outlines the knowledge, skills, and expectations for residency program administrative personnel, that is applied effectively.

Indicator 8.1.1.2: Residency program administrative personnel receive professional development, provided centrally and/or through the residency program, based on their individual learning needs.

Indicator 8.1.1.3: Residency program administrative personnel receive formal and/or informal feedback on their performance in a fair and transparent manner, consistent with any applicable university, health organization, or union contracts.

Domain: Continuous Improvement

Standard 9: There is continuous improvement of the educational experiences, to improve the residency program and ensure residents are prepared for independent practice.

Element 9.1: The residency program committee systematically reviews and improves the quality of the residency program.

Requirement 9.1.1: There is a systematic process to regularly review and improve the residency program.

Indicator 9.1.1.1: There is an evaluation of each of the residency program's educational experiences, including the review of related competencies and/or objectives.

Indicator 9.1.1.2: There is an evaluation of the learning environment, including evaluation of any influence, positive or negative, resulting from the presence of the hidden curriculum.

Indicator 9.1.1.3: Residents' achievements of competencies and/or objectives are reviewed.

Indicator 9.1.1.4: The resources available to the residency program are reviewed.

Indicator 9.1.1.5: Residents' assessment data are reviewed.

Indicator 9.1.1.6: The feedback provided to teachers in the residency program is reviewed.

Indicator 9.1.1.7: The residency program's leadership at the various learning sites is assessed.

Indicator 9.1.1.8: The residency program's policies and processes for residency education are reviewed.

Requirement 9.1.2: A range of data and information is reviewed to inform the evaluation and improvement of all aspects of the residency program.

Indicator 9.1.2.1: Information from multiple sources, including feedback from residents, teachers, administrative personnel, and others as appropriate, is regularly reviewed.

Indicator 9.1.2.2: Information identified by the postgraduate office's internal review process and any data centrally collected by the postgraduate office are accessed.

Indicator 9.1.2.3: Mechanisms for feedback take place in an open collegial atmosphere.

Indicator 9.1.2.4 [Exemplary]: A resident e-portfolio (or an equivalent tool) is used to support the review of the residency program and its continuous improvement.

Indicator 9.1.2.5 [Exemplary]: Education and practice innovations in the discipline in Canada and abroad are reviewed.

Indicator 9.1.2.6 [Exemplary]: Patient feedback to improve the residency program is regularly collected/accessed.

Indicator 9.1.2.7 [Exemplary]: Feedback from recent graduates is regularly collected/accessed to improve the residency program.

Requirement 9.1.3: Based on the data and information reviewed, strengths are identified, and action is taken to address areas identified for improvement.

Indicator 9.1.3.1: Areas for improvement are used to develop and implement relevant and timely action plans.

Indicator 9.1.3.2: The program director and residency program committee share the identified strengths and areas for improvement (including associated action plans) with residents, teachers, administrative personnel, and others as appropriate, in a timely manner.

Indicator 9.1.3.3: There is a clear and well-documented process to evaluate the effectiveness of actions taken and to take further action as required.

Glossary of Terms

Term	Description
academic lead of the discipline	The individual responsible for a clinical department/division (e.g. department chair, division lead)
administrative personnel	Postgraduate and program administrative personnel, as defined below.
assessment	A process of gathering and analyzing information on competencies from multiple and diverse sources to measure a physician's competence or performance and compare it with defined criteria (Royal College of Physicians and Surgeons of Canada, 2012).
attestation	Verification of satisfactory completion of all necessary training, assessment, and credentialing requirements of an area of medical expertise. Attestation does not confer certification in a discipline (Royal College of Physicians and Surgeons of Canada, 2012).
central	This term applies to policies, processes, guidelines, and/or services developed by the faculty of medicine, postgraduate office, and/or postgraduate education committee, and applied to more than one residency program.
certification	Formal recognition of satisfactory completion of all necessary training, assessment, and credentialing requirements of a discipline, indicating competence to practise independently (Royal College of Physicians and Surgeons of Canada, 2012).
CFPC	College of Family Physicians of Canada.
CMQ	Collège des médecins du Québec
competence	The array of abilities across multiple domains of competence or aspects of physician performance in a certain context. Statements about competence require descriptive qualifiers to define the relevant abilities, context, and stage of training or practice. Competence is multi-dimensional and dynamic; it changes with time, experience, and settings (Frank, et al., 2010).

competency (competencies)	An observable ability of a health professional related to a specific activity that integrates knowledge, skills, values, and attitudes. As competencies are observable, they can be measured and assessed to ensure their acquisition. Competencies can be assembled like building blocks to facilitate progressive development (Frank, et al., 2010).
competent	Possessing the required abilities in all domains of competence in a certain context at a defined stage of medical education or practice (Frank, et al., 2010).
continuing professional development	An ongoing process of engaging in learning and development beyond initial training, which includes tracking and documenting the acquisition of skills, knowledge, and experiences.
continuous improvement	The systematic approach to making changes involving cycles of change (i.e. Plan, Do, Study, Act) that lead to improved quality and outcomes. It is used as an internal tool for monitoring and decision-making (e.g., What are the strengths and weaknesses of the residency program? How can we improve our system of assessment?).
dean	The senior faculty officer appointed to be responsible for the overall oversight of a faculty of medicine.
discipline	Specialty and/or subspecialty recognized by one of the certification colleges (Association of American Medical Colleges, 2012).
division/department	An organizational unit around which clinical and academic services are arranged.
domain(s) of competence	Broad distinguishable areas of competence that together constitute a general descriptive framework for a profession (Association of American Medical Colleges, 2012).
educational accommodation	Recognizing that people have different needs and taking reasonable efforts to ensure equal access to residency education.
equitable	Used in the context of having and/or allocating resources, and refers to fair and impartial distribution of resources (Oxford University Press, n.d.).

evaluation	A process of employing a set of procedures and tools to provide useful information about medical education programs and their components to decision-makers (RIME Handbook). This term is often used interchangeably with assessment when applied to individual physicians, but is not the preferred term (Royal College of Physicians and Surgeons of Canada, 2012).
experiential learning	Experiential learning is an engaged learning process whereby students (i.e. residents) “learn by doing” and by reflecting on the experience (University of Michigan, 2016).
faculty development	That broad range of activities institutions use to renew or assist teachers in their roles (Centra, 1978).
faculty of medicine	A faculty of medicine, school of medicine, or college of medicine under the direction of a Canadian university/universities.
fatigue risk management	A set of ongoing fatigue prevention practices, beliefs, and procedures integrated throughout all levels of an organization to monitor, assess, and minimize the effects of fatigue and associated risks for the health and safety of healthcare personnel and the patient population they serve (Fatigue Risk Management Task Force, 2018).
hidden curriculum	A set of influences that function at the level of organizational structure and culture, affecting the nature of learning, professional interactions, and clinical practice (Association of Faculties of Medicine of Canada, 2010).
independent practice	Practice in which physicians are licensed to be accountable for their own medical practice that is within their scope of practice and that normally takes place without supervision.
institution	Encompasses the University, faculty of medicine, and postgraduate office.
inter-institutional agreement (IIA)	A formal agreement used in circumstances where a faculty of medicine requires residents to complete a portion of their training under another recognized faculty of medicine, in alignment with policies and procedures for IIAs as set by the Royal College, CFPC, and/or CMQ.

internal review	An internal evaluation conducted to identify strengths of, and areas for improvement for, the residency program and/or institution.
inter-professional	Individuals from two or more professions (e.g., medicine and nursing) working collaboratively with shared objectives, decision-making, responsibility, and power, to develop care plans and make decisions about patient care (CanMEDS).
intra-professional	Two or more individuals from within the same profession (e.g. medicine) working together interdependently to develop care plans and make decisions about patient care (CanMEDS).
learning environment	The diverse physical locations, contexts, and cultures in which residents learn (Great School Partnership, 2012).
learning site	A hospital, clinic, or other facility that contributes to residents' educational experiences.
mistreatment	Unprofessional behaviour involving intimidation, harassment, and/or abuse.
objective(s)	An outcomes-based statement that describes what the resident will be able to do upon completion of the learning experience, stage of training, or residency program.
physical safety	Includes protection against biological risks, such as immunization, radiation protection, respiratory protection, exposure to body fluids; it also includes protection against risks associated with physical spaces, with care provided during home visits, travel and meetings with violent patients (University of Montreal, n.d.).
postgraduate administrative personnel	Individuals who support the postgraduate dean in coordination and administration related to the oversight of residency programs, including the postgraduate manager (or equivalent).
postgraduate dean	A senior faculty officer appointed to be responsible for the overall conduct and supervision of postgraduate medical education within the faculty of medicine.
postgraduate education committee	The committee (and any subcommittees as applicable) overseen by the postgraduate dean, that facilitates the governance and oversight of all residency programs within a faculty of medicine.

postgraduate manager	Senior administrative personnel responsible for supporting the postgraduate dean and providing overall administrative oversight of the postgraduate office.
postgraduate office	A postgraduate medical education office under the direction of the faculty of medicine, with responsibilities for residency programs.
professional safety	Includes protection from allegations of malpractice, insurance against medical malpractice suits, disclosure assistance, academic and professional record confidentiality, as well as reporting procedures where confidentiality is assured and there are no reprisals (University of Montreal, n.d.).
program administrative personnel	Individuals who support the program director by performing administrative duties related to planning, directing, and coordinating the residency program.
program director	The individual responsible and accountable for the overall conduct and organization of the residency program. The individual is accountable to the postgraduate dean and academic lead of the discipline.
protected time	A designated period of time granted to an individual for the purposes of performing a task and/or participating in an activity.
psychological safety	Includes prevention, protection and access to resources to counter the risks of psychological distress, alcohol or drug dependence, intimidation and harassment (University of Montreal, n.d.).
residency program	An accredited residency education program in one of Canada's nationally recognized disciplines, associated with a recognized faculty of medicine, overseen by a program director and residency program committee.
residency program committee	The committee (and subcommittees, as applicable), overseen by the program director, that supports the program director in the administration and coordination of the residency program.
residency program stakeholder	A person or organization with an interest in and/or who is impacted by the residency program.

resident	An individual registered in an accredited residency program following eligible undergraduate training leading to certification or attestation in a recognized discipline (Royal College of Physicians and Surgeons of Canada, 2012).
resource	Includes educational, clinical, physical, technical, and financial materials and people (e.g. teachers and administrative personnel) required for delivery of a residency program.
Royal College	Royal College of Physicians and Surgeons of Canada.
site coordinator	The coordinator/supervisor with responsibility for residents at a learning site.
social accountability	The direction of education, research and service activities towards addressing the priority health concerns of the community, region, and/or nation. Priority health concerns are to be identified jointly by governments, health care organizations, health professionals, and the public (Boelen & Heck, 1995).
teacher	An individual responsible for teaching residents. Teacher is often used interchangeably with terms such as supervisor or preceptor.
teaching	Includes formal and informal teaching of residents, including the hidden curriculum.
wellness	A state of health, namely, a state of physical, mental, and social well-being, that goes beyond the absence of disease or infirmity (World Health Organization, n.d.).

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