Medical Genetics and Genomics Training Experiences

2025
VERSION 2.0

These training requirements apply to those who begin training on or after July 1, 2025.

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

TRANSITION TO DISCIPLINE (TTD)

The purpose of this stage is to provide an orientation to the medical genetics and genomics residency program, including the hospital environment, with a focus on the medical genetics' clinic and inpatient consultation service. In this stage, residents focus on assessing, presenting, and documenting basic examinations; formulating a differential diagnosis; and selecting and providing interpretation of first-line genetic investigations.

Required training experiences (TTD stage):

1. Clinical training experiences
   - 1.1. Medical Genetics and Genomics
     - 1.1.1. Clinic
     - 1.1.2. Inpatient consultation service
     - 1.1.3. Observation of triage of new referrals

2. Other training experiences
   - 2.1. Orientation to the program, including policies, resident resources, program portfolios, learning resources, and assessment system (including Competence by Design)
   - 2.2. Orientation to the hospital(s), including policies, admitting and discharge processes, care protocols, and information system(s)
   - 2.3. Orientation to learning resources, including Online Mendelian Inheritance in Man (OMIM), GeneReviews, PubMed, and textbooks to prepare for clinic, consultations, and interpretation of genetic test results
   - 2.4. Formal instruction in
     - 2.4.1. The basic and clinical sciences of Medical Genetics and Genomics, including:
       - 2.4.1.1. The scope of clinical genetics practice
       - 2.4.1.2. Approach to metabolic emergencies

2.4.1.3. Approach to first-line testing in
- 2.4.1.3.1. Cytogenetics
- 2.4.1.3.2. Molecular genetics
- 2.4.1.3.3. Biochemical genetics

2.4.1.4. The role and scope of practice of genetic counsellors

Recommended training experiences (TTD stage):

3. Clinical training experiences
   - 3.1. After-hours coverage of Medical Genetics

4. Other training experiences
   - 4.1. Attendance at rounds, which may include grand rounds, case rounds, and critical appraisal activities such as journal club
   - 4.2. Peer mentorship, such as pairing a junior and senior resident

FOUNDATIONS OF DISCIPLINE (F)

The purpose of this stage is to gain experience assessing and managing patients of all ages with common conditions in a range of settings. During this stage, residents perform patient assessments and create and communicate management plans for common presentations. They develop their ability to recognize factors that lead to variability, complexity, comorbidity, and acuity. They gain experience consulting other health professionals, integrating recommendations into care plans, and coordinating transitions of care.

Required training experiences (Foundations stage):

1. Clinical training experiences
   - 1.1. Internal medicine, including
     - 1.1.1. Inpatient ward
     - 1.1.2. Cardiology inpatient service and/or clinic
     - 1.1.3. After-hours coverage
   - 1.2. Pediatrics, including
     - 1.2.1. Inpatient ward
     - 1.2.2. Cardiology inpatient service and/or clinic
     - 1.2.3. Child development clinic
     - 1.2.4. Hematology clinic
     - 1.2.5. Level III neonatal intensive care unit (NICU)
     - 1.2.6. After-hours coverage
   - 1.3. Neurology, including
     - 1.3.1. Adult neurology inpatient service and/or clinic

1.3.2. Pediatric neurology inpatient service and/or clinic

1.4. Maternal-fetal medicine service, or equivalent

2. Other training experiences
   2.1. Formal instruction in physician wellness for a sustainable career
   2.2. Attendance at rounds, including grand rounds, patient rounds, and case conferences
   2.3. Critical appraisal activities, such as journal club
   2.4. Completion of a Neonatal Resuscitation Program (NRP) course, or equivalent
   2.5. Completion of a Basic Life Support (BLS) course, or equivalent
   2.6. Completion of an Advanced Cardiac Life Support (ACLS) course, or equivalent
   2.7. Completion of a Pediatric Advanced Life Support (PALS) course, or equivalent

Recommended training experiences (Foundations stage):

3. Clinical training experiences
   3.1. Endocrinology clinic, adult or pediatric
   3.2. Counselling, which may include a variety of clinical experiences, including with social work, psychology, and psychiatry
   3.3. Attendance at fetal pathology examinations
   3.4. Medical oncology inpatient service and/or clinic
   3.5. Physical medicine and rehabilitation clinic

4. Other training experiences
   4.1. Attendance at quality assurance and improvement activities, including morbidity and mortality rounds

Optional training experiences (Foundations stage):

5. Clinical training experiences
   5.1. Pediatric complex care
   5.2. Dermatology clinic, adult or pediatric
   5.3. Immunology clinic, adult or pediatric
   5.4. Medical imaging
   5.5. Level I or II neonatal care unit, or equivalent
   5.6. Nephrology inpatient service and/or clinic, adult or pediatric
   5.7. Obstetric medicine inpatient service and/or clinic
   5.8. Ophthalmology clinic, adult or pediatric
   5.9. Palliative medicine service, adult or pediatric
   5.10. Reproductive endocrinology or fertility clinic

CORE OF DISCIPLINE (C)

In this stage, residents build on the skills acquired in the Foundations stage as they develop their approach to assessing and managing patients with acute and chronic genetic presentations. Residents request and interpret reports of advanced genetic investigations, and provide pre- and post-test counselling to patients. They lead patient care teams and communicate with patients and families in complex situations.

Required training experiences (Core stage):

1. Clinical training experiences
    - 1.1. Medical Genetics and Genomics across the breadth of patients of all ages with known or suspected genetic diseases, including
        - 1.1.1. Clinic
        - 1.1.2. Inpatient consultation service
        - 1.1.3. Longitudinal/continuity clinic
        - 1.1.4. After-hours coverage
    - 1.2. Biochemical genetics (metabolic) clinic
    - 1.3. Genetics laboratory
        - 1.3.1. Cytogenetics
        - 1.3.2. Molecular genetics
        - 1.3.3. Biochemical genetics

2. Other training experiences
    - 2.1. Formal instruction in
        - 2.1.1. The basic and clinical sciences of Medical Genetics and Genomics, including
            - 2.1.1.1. Basic genetic epidemiology and concept of model organisms
            - 2.1.1.2. Cytogenetics
            - 2.1.1.3. Embryology and teratology
            - 2.1.1.4. Molecular genetics and genomics
            - 2.1.1.5. Population genetics
            - 2.1.1.6. Principles, interpretation, and limitations of newborn screening
        - 2.1.2. Communication skills, including special situations, such as breaking bad news and adverse medical events
        - 2.1.3. Critical appraisal of literature
        - 2.1.4. Clinical trial design
        - 2.1.5. Research methodology and the conduct of scholarly activity
        - 2.1.6. Oral presentation skills
        - 2.1.7. Patient safety and quality improvement
        - 2.1.8. Genomic ethical, environmental, economic, legal, and social issues (GE3LS)
        - 2.1.9. Physician wellness for a sustainable career

2.2. Attendance at quality assurance and improvement activities, including morbidity and mortality rounds

2.3. Supervision and teaching of junior learners

2.4. Teaching others, which may include peer learners, staff, other health professionals, and/or the public

2.5. Initiation of a research, continuous quality improvement, or other scholarly activity

2.6. Formative review with supervisor or mentor of their scholarly portfolio, which may include research training, research ethics applications, research projects, presentations, advocacy projects, committee involvement, quality improvement, journal club, conference/course attendance

Recommended training experiences (Core stage):

3. Clinical training experiences
   3.1. Medical Genetics and Genomics in a remote setting (e.g., telehealth, remote sites)

4. Other training experiences
   4.1. Newborn screening, clinical or laboratory experience

Optional training experiences (Core stage):

5. Clinical training experiences
   5.1. Individualized or enhanced skills acquisition related to individual interest, career plan, or community needs, within the home institution or in other settings

TRANSITION TO PRACTICE (TTP)

The focus of this stage is the development and demonstration of independence in patient care. By the end of this stage, residents independently manage an inpatient service and outpatient practice for patients with any known or suspected genetic condition. This stage also focuses on implementing a plan for lifelong learning and continuing professional development.

Required training experiences (TTP stage):

1. Clinical training experiences
   1.1. Medical Genetics and Genomics, in the role of junior attending[1]
      1.1.1. Clinic
      1.1.2. Inpatient consultation service
      1.1.3. Longitudinal/continuity clinic
      1.1.4. Triage of new referrals
      1.1.5. After-hours coverage

[1] "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. Other training experiences
   - 2.1. Formal instruction in practice management, including licensing requirements, malpractice insurance, and remuneration options
   - 2.2. Presentation at formal teaching sessions, such as grand rounds
   - 2.3. Participation in quality assurance and improvement activities
   - 2.4. Supervision and teaching of junior learners
   - 2.5. Formal teaching sessions, which may include peer learners, staff, other health professionals, or the public
   - 2.6. Dissemination of scholarly work(s), which may include
     - 2.6.1. Presentation of a research design, poster, or oral presentation at a national or international meeting; and/or
     - 2.6.2. Preparation and submission of a manuscript for peer review
   - 2.7. Instruction in continuing professional development requirements and the use of MAINPORT ePortfolio

Recommended training experiences (TTP stage):

3. Other training experiences
   - 3.1. Participation in residency in-training examinations as an examiner
   - 3.2. Participation in hospital or university committee(s)
   - 3.3. Identification of a potential mentor aligned with individual interest and career path

Optional training experiences (TTP stage):

4. Clinical training experiences
   - 4.1. Individualized or enhanced skills acquisition related to individual interest, career plan, or community needs, within the home institution or in other settings

5. Other training experiences
   - 5.1. Shadow billing

CERTIFICATION REQUIREMENTS

Royal College certification in Medical Genetics and Genomics requires all of the following:

1. Successful completion of the Royal College examination in Medical Genetics and Genomics and
2. Successful completion of the Royal College Medical Genetics and Genomics Portfolio.

NOTES:

The Medical Genetics and Genomics Portfolio refers to the list of entrustable professional activities across all four stages of the residency Competence Continuum, and associated national standards for assessment and achievement.

MODEL DURATION OF TRAINING

Progress in training occurs through demonstration of competence and advancement through the stages of the Competence Continuum. Medical Genetics and Genomics 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 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 Genetics and Genomics' suggested course of training, for the purposes of planning learning experiences and schedules, is as follows:

2 blocks in Transition to Discipline

20 blocks in Foundations of Discipline

35 blocks in Core of Discipline

8 blocks in Transition to Practice

**One block is equal to 4 weeks*

Guidance for postgraduate medical education offices

The stages of the Competence Continuum in Medical Genetics and Genomics are generally no longer than

2 blocks for Transition to Discipline

20 blocks for Foundations of Discipline

35 blocks for Core of Discipline

8 blocks for Transition to Practice

Total duration of training – 5 years

*One block is equal to 4 weeks

This document is to be reviewed by the Specialty Committee in Medical Genetics and Genomics by January 31, 2028.

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