

GUIDELINES FOR COMBINED TRAINING IN INTERNAL MEDICINE AND MEDICAL GENETICS AND GENOMICS

Preamble

This is intended to provide educational guidance to program directors in Internal Medicine and Medical Genetics and Genomics as well as to individuals interested in combined training in internal medicine and medical genetics and genomics. All program requirements in both specialties, as described on the ACGME website, apply to the combined training, unless specifically detailed in this document. This integrated program will require four, not five years, as would be necessary if these two residency programs were completed sequentially. Every program that plans to offer this combined training must be approved by both the American Board of Internal Medicine (ABIM) and the American Board of Medical Genetics and Genomics (ABMGG) before residents are recruited. In addition, both Boards (and Residency Review Committees (RRCs) will review these training requirements periodically.

Objectives of Combined Training

The objective of combined training in internal medicine and medical genetics and genomics is to promote the development of physicians with broad-based training in both specialties and specific expertise in areas common to both specialties. Physicians completing this training should be competent internists and medical geneticists capable of professional activity in either discipline. It is anticipated that many trainees will develop careers which take advantage of the joint training experience by serving as consultants focused on genetic diseases in adults or to be actively involved in research or administration in genomic medicine or precision medicine. The strengths of the two residencies should complement each other to provide the optimal educational experience.

Both Boards encourage residents to extend their training for an additional fifth year or more in investigative or academic pursuits in order to prepare graduates of this combined training program for careers in research and academics.

General Requirements

A combined residency in internal medicine and medical genetics and genomics must include at least four years of coherent training integral to the residencies of the two disciplines which meet the program requirements for accreditation by the RRC-IM and the RRC-MGG, respectively.

The two participating core residency programs must be accredited by the ACGME, be sponsored by the same ACGME sponsoring institution and must be in geographic proximity within the same academic health system. Exceptions may be considered at the discretion of both Boards. Participating sites that are used for training by the combined programs must be approved for simultaneous use by the core programs. Affiliated residencies must be located close enough to facilitate cohesion among the residencies' house staff, continuity clinic experiences consistent with ACGME requirements for continuity clinic, integrated conferences and faculty exchanges of curriculum, evaluation, and administration and related matters.

At the conclusion of 48 months of training in internal medicine and medical genetics and genomics, the resident should have had instruction and experience in the prevention, detection, and treatment of acute and chronic medical and genetic illnesses presenting in both the inpatient and ambulatory settings. Trainees should be exposed to the medical problems and genetic evaluation of patients from infancy to adulthood, including pregnant women, and receive training in the socioeconomics of illness, the ethical care of patients, and in the team approach to providing patient care.

The training of residents while on internal medicine rotations is the responsibility of the internal medicine faculty, and while on medical genetics and genomics rotations, the responsibility of the medical genetics faculty. Vacation, leave and meeting time will be shared equally by both training residencies.

Except for the following provisions, combined residencies must conform to the program requirements for accreditation of residencies in internal medicine and medical genetics and genomics.

The Resident

Residents should enter a combined training residency at the first postgraduate year level (R-1). A resident may enter a combined residency at the R-2 level only if the first residency year was served in a categorical residency in Internal Medicine at the same academic health system. Exceptions to training in the same academic health system may be considered at the discretion of both Boards.

Transitional year training will provide no credit toward the requirements of either Board. Residents may not enter combined residency training and receive credit beyond the R-1 level or transfer to another combined residency without prospective approval of both Boards. A resident transferring from a combined residency to a categorical Internal Medicine or Medical Genetics and Genomics program should seek specific eligibility information from the appropriate Board.

Training in each discipline must incorporate progressive responsibility for patient care, supervision and teaching of medical students and junior residents throughout the training period.

The Program Director(s)

Combined residencies must be coordinated by a designated director or co-directors who can devote time and effort to the educational program. The Program Director is responsible for assuring all aspects of the program requirements are met. An overall program director must be appointed from either specialty, with an associate director or co-director from the other specialty to ensure both integration of training and supervision in both specialties. One director must be certified by the American Board of Internal Medicine, and the other director must be certified by the American Board of Medical Genetics and Genomics. An exception to the above requirements would be a single director who is certified in both specialties and has an academic appointment in each department. The supervising directors from both specialties must embrace similar values and goals for the combined program and document meeting with each other at least quarterly to monitor the progress of each resident and the overall success of the program. Both directors must verify satisfactory completion of the training program on the resident's final summative evaluation form.

Duration of Training

Training requirements for eligibility for the certifying examination of each Board will be fulfilled by 48 months of training in an approved combined program. A reduction of 12 months of training compared to that required for two separate residencies is possible due to overlap of curriculum and training requirements. There must be 24 months of training in each specialty. The requirement of 36 months of internal medicine training is met by 24 months of internal medicine training, with six months of credit appropriate to internal medicine during the 18 months of medical genetics and genomics training, and six months credited to both specialties. Likewise, the 24 months of medical genetics and genomics training is met by 18 months of medical genetics and genomics training with six months credited to both specialties.

Core Curriculum Requirements

A clearly described written curriculum must be available to the residents, faculty and both Residency Review Committees. The curriculum must assure a cohesive, planned educational experience, and not simply comprise a series of rotations between the two specialties. Duplication of clinical experiences between the two specialties should be avoided, and periodic review of the training curriculum must be performed. This review must include the training directors from both departments in conjunction with faculty and residents. Combined training must not interfere with or compromise the training of the categorical residents in either residency program.

The first twelve months of training must be spent in internal medicine. As long as 20 total internal medicine months are clinical, all the first year need not be in direct patient care experiences, which would allow at least some time for electives, vacation, etc. The R-2, and R-3 years should include both internal medicine and medical genetics and genomics rotations; in each of the two years, no less than four months full-time equivalent (FTE) should be spent in each specialty. It is important that the program directors make certain that during the latter three years of the combined residency, each resident will have a total of 12 months of training in internal medicine, 18 months of training in clinical genetics and genomics, and six months credited to both specialties.

Joint educational conferences involving residents from internal medicine and medical genetics are recommended and should specifically include the participation of residents in the combined training program. Availability of faculty from both specialties for consultation during clinical rotations, and during continuity clinic, is encouraged.

Requirements for Internal Medicine

During the 24 months of training in internal medicine, each resident must obtain 20 months of direct patient care responsibility in settings where the resident personally provides or supervises less experienced residents who provide direct care to patients in inpatient or ambulatory settings.

Each resident must have at least four weeks experience in emergency medicine in blocks not less than two weeks in length, having first-contact responsibility, for the diagnosis and management of adults. The resident's responsibility must include direct participation in reaching decisions about admissions. Not more than two months of Emergency Medicine will count toward the requirements of Internal Medicine.

Each resident must be assigned to the care of patients in critical care units (e.g. intensive care units, cardiac care unit, respiratory care unit) for four weeks in the first year, and again, at least on two four-week rotations during the months of internal medicine training which may occur during years R-2, R-3, or R-4. Minimum critical care experience for Internal Medicine is three months.

Continuity clinic is required for each resident. Block clinic experiences are allowed. Residents must have a longitudinal team-based continuity experience for the duration of the educational program through which they develop a continuous, long-term therapeutic relationship with a panel of patients. Residents should work with other professionals such as social workers, nurse practitioners, physician assistants, psychologists, and dieticians in the clinics.

During the internal medicine phase of training, subspecialty experience must be provided to every resident for at least four months. Subspecialty experience should include both inpatient and outpatient experiences. Some of this experience must include a role as a consultant. During the

Internal Medicine training, significant exposure to cardiology, oncology, and neurology is necessary. Supervised clinical experiences in the diagnosis and treatment of patients with cardiovascular genetic disorders, neurogenetic disorders, and inherited cancer syndromes are strongly encouraged for their educational value to both specialties.

When on internal medicine rotations, residents must regularly attend the usual conferences of the internal medicine residency, e.g., morning report, core curriculum conferences, medicine grand rounds, work rounds and morbidity and mortality conferences.

Requirements for Medical Genetics and Genomics

During the 18 months of medical genetics and genomics training, the curriculum must broad-based, clinically oriented medical genetics experiences, which must include direct patient care of prenatal, pediatric and adult patients, including cancer patients. The training should be the same as described in the Program Requirements of the Residency Review Committee for Medical Genetics and Genomics, with the exceptions that follow.

At least six of the core medical genetics training months will be spent in supervised clinical experiences in the assessment, diagnosis, treatment and care of patients with a wide variety of disorders; the patient population must include significant numbers of adolescent, adult, and geriatric patients with known or suspected genetic conditions. This requirement is not fulfilled by supervised clinical experiences in the evaluation of pregnant adult patients seen in the prenatal setting. For patients with metabolic diseases, residents must have experience in both inpatient and outpatient settings. There must also be a minimum of two continuous weeks in each type of laboratory (clinical biochemical genetics, laboratory genetic and genomics). Refer to the ACGME Program Requirements for Graduate Medical Education in Medical Genetics and Genomics for details of what these experiences must include. Residents must not be assigned clinical responsibilities at the same time that they are participating in the required laboratory experiences. Residents may continue their continuity clinic experiences during their medical genetics and genomics training, with the exception of during their required laboratory experiences.

Patient Population

Residents must have the opportunity to care for a number of patients and families sufficient to permit them to develop an understanding of the wide variety of medical genetic problems including Mendelian disorders, inborn errors of metabolism, diseases of chromosome number and structure, multifactorial disorders, syndromes, congenital malformations, and other genetically influenced conditions. Typically, this will mean that programs will be sufficiently broad-based to care for at least 100 different patients or families per year for each resident. These patients or families may be evaluated in outpatient or inpatient settings. Since medical genetics involves

families and individuals of all ages, residents must be competent to work with children as well as adults, and must have an opportunity to gain an understanding of family dynamics as they relate to issues of diagnosis, counseling and management.

Correlation of Laboratory and Clinical Experience

Experiences in clinical biochemical genetics, and laboratory genetics and genomics must be integral components of each program, and residents must have regular opportunities to develop their abilities to understand and critically interpret laboratory data. Residents should develop an understanding of the appropriate use of laboratories during diagnosis, counseling and management of patients with genetic disorders. Toward this end, resident education must include ongoing participation in the working conferences of laboratories as well as discussions of laboratory data during other clinical conferences.

Other Health-Care Professionals

Residents must have regular opportunities to work with genetic counselors, nurses, nutritionists, and other healthcare professionals who are involved in the provision of clinical medical genetics services. Because of the complex nature and multiple system involvement of genetic disorders, residents must be exposed to multidisciplinary and interdisciplinary models during residency and must be proficient in organizing teams of health-care professionals to provide the necessary resources for their patients.

Responsibilities for Patient Care

The development of mature clinical judgment requires that residents, properly supervised, be given responsibility for patient care commensurate with their ability. This can be achieved only if a resident is involved in the decision-making process and in the continuity of patient care. Residents must be given the responsibility for direct patient care in all settings, including diagnostic and therapeutic planning and management, subject to review and approval by the attending physician.

Didactic Curriculum

The didactic curriculum must include clinical teaching conferences distinct from the basic science lectures and didactic sessions. Teaching conferences should include formal didactic sessions about clinical laboratory topics, medical genetics rounds, journal clubs, and follow-up conferences for genetics clinics. There must also be lectures or other didactic sessions on basic molecular biologic techniques pertinent to clinical testing and understanding genetic research; the cell cycle and molecular genetics of cancer; DNA, RNA, and protein chemistry, including DNA repair, principles of replication, recombination, and segregation of alleles during meiosis; basic mechanisms of

inheritance, including sex chromosomes, autosomes and mitochondrial DNA; mechanisms of chromosomal rearrangement; behavior of genes in a population, including Hardy-Weinberg equilibria of alleles; Bayesian analysis and other methods of genetic risk assessment; human embryology and development; genetic linkage, mapping and association studies; molecular organization of the genome, including molecular evolution mechanisms; gene expression and mechanisms of regulation of genes and genomes, including epigenetic regulation; bioinformatic approaches to interpreting molecular test results, including methods to assign causation to novel findings; inheritance of complex traits and genetic variation; and principles of biochemical genetics and metabolism. Research seminars should be provided as part of the experience. Ethics training in research should be included in the curriculum.

Integration of the genetic clinical conferences with involvement of the internal medicine generalists and subspecialists is urged.

Evaluation

There must be adequate, ongoing evaluation of the knowledge, skills, and performance of residents. Entry evaluation assessment, interim testing and periodic reassessment, utilizing appropriate evaluation modalities, including in-training examinations as currently required by both internal medicine and medical genetics and genomics should be employed. There must be a method of documenting the procedures performed by the residents. Such documentation must be maintained by the Program Director(s), be available for review by the RRCs in Internal Medicine and Medical Genetics and Genomics, the ABIM, the ABMGG, and site visitors, and may be used to provide documentation for application for hospital privileges by graduates of these training programs.

The faculty must provide a written evaluation of each resident after each rotation and these must be available for review by the site visitors of the Residency Review Committees. Written evaluation of each resident's knowledge, skills, professional growth and performance, using appropriate criteria and procedures, must be accomplished at least semi-annually and communicated to and discussed with the resident in a timely manner.

Residents should be advanced to positions of higher responsibility only on the basis of evidence of their satisfactory progressive scholarship and professional growth.

The program must maintain a permanent record of evaluation of each resident and have it accessible to the resident and other authorized personnel. The program director and faculty are responsible for documenting a final evaluation for each resident who completes the program. The final evaluation should be part of the resident's permanent record and maintained by the institution.

This evaluation must include a review of the resident's performance during training and should verify that the resident has performed in a professional manner and is able to practice competently and independently and is prepared to apply for the certification processes of both internal medicine and medical genetics and genomics.

Fifth Year

Both Boards encourage residents to extend their training for an additional fifth year in investigative or academic pursuits in order to prepare graduates of combined training in medical genetics and genomics and internal medicine programs for careers in academic medicine.

Certification

To meet eligibility for dual certification, the resident must satisfactorily complete 48 months in a combined training program as verified by both program directors. The written certifying examinations may not be taken until all required years of training of both specialties are satisfactorily completed.