INTRODUCTION

Combined training in internal medicine and medical genetics will promote the overall development of appropriate models of clinical care for adult patients diagnosed with genetic disorders. Residents who complete combined internal medicine-medical genetics training will have special expertise in managing the transitional care of older children and adolescents with hereditary disease, such as patients with Down syndrome, Turner syndrome, or cystic fibrosis, to appropriate medical care as adults. Trainees will also have special expertise in performing genetic risk assessment for adult onset complex diseases, such as cardiovascular diseases, adult-onset diabetes mellitus and cancer as well as assessing and conveying the genetic risks to family members.

Combined training includes the components of independent internal medicine and medical genetics residency programs that are accredited respectively by the Residency Review Committee for Internal Medicine and by the Residency Review Committee for Medical Genetics, both of which function under the auspices of the Accreditation Council for Graduate Medical Education (ACGME). While combined training will not be independently accredited by the RRCs and the ACGME, the continued approved accreditation status of the parent internal medicine and medical genetics programs is essential for the stability and continued approval of the combined training in Internal medicine and medical genetics. Thus, residents for combined training must not be recruited if the accreditation status of either program is probationary or provisional. Proposals for combined residency training must be submitted to, and approved by, the American Board of Internal Medicine and the American Board of Medical Genetics before a candidate can be accepted into this joint training.

OBJECTIVES

The objectives of a combined residency in internal medicine and medical genetics include the training of specialist physicians for practice or academic careers addressing the spectrum of genetic illnesses in all phases of life while concentrating on adolescents and adults. Graduates of a combined residency may function as internist geneticists in private or academic practice environments or enter subspecialty training. This clinical training can also prepare graduates to undertake research in areas shared by internal medicine and medical genetics including the genetics of common diseases, clinical epidemiology, medical decision-making, and health care delivery.

GENERAL REQUIREMENTS

Combined training in internal medicine and medical genetics must include at least 60 months of coherent training integral to residencies in the two disciplines that meet the program requirements for accreditation by the RRC for Internal Medicine and the RRC for Medical Genetics. Combined training must be conducted under the auspices of the Committee on Graduate Medical Education within a single institution and its affiliated hospitals. Documentation of the unqualified commitment of the hospitals and facilities to the institutional goals for the combined training must be available in signed agreements. Affiliated institutions must be located close enough to facilitate cohesion among the house staff, attendance of trainees at weekly continuity clinics and integrated conferences, and faculty exchanges relating to the curriculum, evaluation of trainees, administration of the program, and related matters.
Ideally, at least two residents should be enrolled in combined training each year, although a single resident per year would be acceptable. A combined training pathway with no trainees for a period of five years must reapply for approval by both Boards.

At the conclusion of 60 months of combined training in internal medicine and medical genetics, the residents should have had experience and instruction in the prevention, detection and treatment of acute and chronic medical illness, health maintenance, and the rehabilitation of patients. Residents should also have instruction in the influence of socioeconomic status on disease, the ethical care of patients and families, and in the team approach to the provision of medical care.

THE RESIDENT

Residents should enter combined training at the R-1 level, but may enter as late as the beginning of the R-2 level if the R-1 year was served in a categorical or preliminary residency in internal medicine in the same institution. Under unusual circumstances, and with prior approval of both boards, individuals may be accepted who have trained in other ACGME-accredited internal medicine programs. Residents may not enter combined training beyond the R-2 level. Transfer between combined programs must have the prospective approval of both boards and is allowed only once during the five-year training period. In a transfer between combined training programs, residents must be offered and must complete a fully integrated curriculum. A resident transferring from combined training to a straight internal medicine or medical genetics program should have the prospective approval of the receiving board.

Vacations, leave and meeting time will be taken from the training time in each discipline on an equal basis. Absence from training (vacation, leave) exceeding five months of the 60 months must be made up.

Credit for transitional year training toward the eligibility requirements for certification by either the ABIM and the ABMG shall not be recognized unless at least 10 months of this year have been completed under the direction of a program director of an ACGME accredited residency in internal medicine.

COMBINED TRAINING DIRECTOR AND FACULTY

The combined residency must be coordinated by a designated full-time director certified in both specialties, or co-directors certified in their respective specialties who can devote substantial time and effort to the educational program. If there is not a single director who is certified in both specialties and has an academic appointment in each department, both specialties must be represented in the directorship. The director or directors must ensure both integration of the residency and supervision in each discipline, and if there are two directors, both must embrace similar values and goals for the combined training program. The supervising director(s) must document meetings at least quarterly to monitor the success of the combined residency and the progress of each resident.
As a general principle, the overall training of residents in internal medicine is the responsibility of the medicine faculty, and the medical genetics training is the responsibility of the medical genetics faculty. There should be an adequate number of faculty members who devote sufficient time to provide leadership to the residency and supervision of the residents. Ideally, some faculty members should be certified by both ABIM and ABMG. Internal medicine faculty must be certified by the ABIM and Medical Genetics faculty must be certified by the ABMG.

**LENGTH OF TRAINING**

Training requirements for eligibility for the certification process of each board will be satisfied by 60 months of approved combined training. A reduction of 12 months over that required for two separate residencies is possible due to the overlap of curriculum and experience inherent in the training in each discipline. The ABIM requirement of 36 months of internal medicine training is met by 30 months of training in the internal medicine component of the combined residency, and six months of credit is granted for training appropriate to internal medicine obtained during the 30 months of medical genetics training. The ABMG requirement has two components: (1) 24 months of training in an ACGME-accredited program (other than medical genetics) is met by the 24 months of training in internal medicine and (2) 24 months of training in medical genetics is met by 6 months credit for medical genetics-focused internal medicine subspecialty rotations, and 18 months of training in medical genetics.

**CORE CURRICULAR REQUIREMENTS**

The core curriculum for combined internal medicine/medical genetics residents must include progressive responsibility for patient care and teaching. A clearly described written curriculum must be available for residents, faculty, and the internal medicine and medical genetics RRCs. The curricular components must conform to the goals and objectives in the program requirements for accreditation in internal medicine and medical genetics. There must be 30 months of training in internal medicine and 30 months of training in medical genetics. The curriculum must assure a cohesive, planned educational experience and not simply comprise a series of rotations between the two specialties. Periodic review of the combined training curriculum must be performed by the residency director(s) and chairs of both departments in consultation with residents and faculty from both departments in accordance with ACGME and RRC requirements.

Year one of combined training must consist of at least 10 months in internal medicine. In year two, the first six months must include at least three months of medical genetics. In the second through fourth years, continuous assignments to one specialty or the other should not be less than three or greater than six months in duration. The fifth year of combined training will usually consist of 12 months in medical genetics. Except where stated in the program requirements for each specialty, rotations must be at least four weeks long. For valid educational reasons, the training director may permit occasional variations in these assignments in the R-3, R-4 and R-5 years.

Care must be exercised to avoid unnecessary duplication of educational experiences to provide as many educational opportunities as possible. It is particularly important that training exceeding four months in intensive care, coronary care, and transplantation units be avoided.
Residents shall be encouraged to follow their continuity patients during the course of any hospitalizations. At a minimum, a once-weekly continuity clinic experience must be maintained throughout the first four years of combined training for at least 27 months of continuity clinic experience. This experience can be obtained either in a weekly combined medicine/genetics continuity clinic or by alternating internal medicine and medical genetics continuity experiences on a weekly basis. Sequential continuity experiences (i.e., 30 months of internal medicine followed by 30 months of medical genetics or vice versa) are not acceptable. Continuity clinic experience should continue during the fifth year of training.

Where it is feasible to do so, joint internal medicine and medical genetic experiences should be provided. For example, rotations in endocrinology, oncology, hematology, gastroenterology, dermatology, neurology, preventive cardiology, and rheumatology might be designed to provide simultaneous internal medicine and medical genetics knowledge and skill development applicable to the subspecialty or specialty area. Credit for up to six months of these joint experiences should be granted by both disciplines, provided that the rotations occur after course work in basic genetics has been completed, that medical genetics and internal medicine faculty are involved in the rotations, and log-books of patient cases with medical genetics problems are kept for subsequent review with medical genetics faculty. There must be at least a one-month experience in adolescent medicine. Assignments to adolescent services may be credited to training requirements in both specialties.

In addition to the mandated requirements in internal medicine and medical genetics, the curriculum should have sufficient flexibility to prepare the resident for a chosen career venue. For example, a resident choosing a metabolic disease practice might want more elective time in metabolic clinics and in the intensive care units where patients with acute metabolic illness are treated.

The supervising director(s) must document meetings at least monthly with all residents in the combined training pathway for educational activities such as jointly sponsored journal clubs, feedback on performance, counseling, visiting professors, clinic conferences, occasional combined grand rounds, medical ethics conferences, and research projects.

**REQUIREMENTS FOR INTERNAL MEDICINE**

During the 30 months of internal medicine, each resident must obtain 20 months of direct responsibility for patients with illnesses in the domain of internal medicine, including geriatric medicine. The opportunity to supervise more junior residents must be provided for at least six months.

Each resident shall have a one-month experience during the first year and again during the second or third years in emergency medicine, having first-contact responsibility for the diagnosis and management for adults.

Each resident must be assigned to the care of patients in medical intensive care units, cardiac care units, respiratory care units for 4 weeks during R-1 or R-2 years and for at least four, but not more than eight, additional weeks during R-3 or R-4.
At least 33% of the 30 months in internal medicine must involve non-hospitalized patients. Ambulatory training experience must include for each resident at least one bi-weekly, half-day continuity clinic with general internal medicine patients that occurs during at least 27 months over 36 consecutive months. At least two months of block experience in ambulatory internal medicine must also be provided. Additional ambulatory experiences may include subspecialty clinics, walk-in clinics, and brief rotations for appropriate interdisciplinary experience in areas such as dermatology, office gynecology, and psychiatry. Health maintenance, prevention and rehabilitation should be emphasized. Residents should work with other professionals such as social workers, nurse practitioners, physician assistants, behavioral scientists, and dietitians in the clinics.

Subspecialty experiences must be provided to every resident for at least four months. Some of this must include experience as a consultant. Experience may be in-patient, outpatient, or a combination thereof.

Residents must regularly attend morning report, medical grand rounds, residents' work rounds, and mortality and morbidity conferences when on internal medicine rotations.

**REQUIREMENTS FOR MEDICAL GENETICS**

The development of the resident’s skills in medical genetics will be fostered by experiences that prepare the residents to provide comprehensive diagnostic, management and genetic counseling services for patients with genetic, or possibly genetic, disorders. The resident will also gain skills in planning and coordinating large-scale screening programs for inborn errors of metabolism, hemoglobinopathies, chromosome abnormalities, neural tube defects, common diseases of adulthood, and other genetically influenced conditions.

Upon completion of combined training, residents will be able to:

1. Diagnose and manage genetic disorders;
2. Provide patient and family genetic counseling;
3. Use their knowledge of heterogeneity, variability, and natural history of genetic disorders in decision making for patient care;
4. Elicit and interpret individual and family medical histories;
5. Interpret clinical genetic and specialized laboratory testing information;
6. Explain the causes and natural history of genetic disorders;
7. Provide genetic risk assessment for prenatal, pediatric and adult-onset genetic disorders;
8. Interact with other health care professionals in the provision of services for patients with genetically influenced disorders.

The combined training should be the same as described in the program requirements of the RRC for Medical Genetics, with the exception that 30 months of combined training must be in medical genetics.
**Patient Population**

Residents must have the opportunity to care for a sufficient number of patients and families to permit them to develop an understanding of the wide variety of medical genetic problems, including Mendelian single gene disorders, syndromes, prenatal issues, congenital malformations and birth defects, adult-onset common diseases, and other genetically influenced conditions. Typically, this will mean that programs will care for at least 100 different patients or families per year for each resident. These patients or families must be seen in outpatient and inpatient settings. As medical genetics involves families and individuals of all ages, residents must be competent to work with both adults and children. The resident must also have an opportunity to gain an understanding of family dynamics as they relate to issues of diagnosis, genetic counseling and management.

**Correlation of Laboratory and Clinical Experience**

Clinical biochemical genetic, molecular genetic and cytogenetic laboratories 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 in 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, dieticians, nutritionists, social workers, and other health-care 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 of patient care during the residency and must be proficient in organizing teams of health-care workers to provide the necessary resources for patients.

**Responsibilities for Patient Care, Including Continuity Care Experiences**

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 the resident is involved in decision-making processes and continuity of patient care. Residents must be given the responsibility for direct patient care in all settings, including planning and management, both diagnostic and therapeutic, subject to review and approval by the attending physician. Continuity clinic experiences are recommended throughout the 30 months of medical genetics training.
Basic Sciences

Each resident must participate formally through lectures or other didactic sessions in the equivalent of a one-year graduate-level course in basic, human, and medical genetics, including exposure to population and quantitative genetics, Mendelian and non-Mendelian genetics, cytogenetics, biochemical genetics and molecular genetics. Attendance at research seminar should be part of the combined training experience but should not be considered an acceptable alternative to this basic science didactic component.

Clinical Conferences

Clinical teaching conferences must be organized by the faculty for the residents, and attendance by the residents and the faculty must be documented. These conferences must be distinct from the basic science lectures and didactic session. Clinical teaching conferences may include formal didactic session on clinical laboratory topics covered on medical genetic rounds, journal clubs and follow-up conferences for genetic clinics. In combined training residencies in internal medicine and medical genetics, integration of the genetic clinical conferences with involvement of the internist generalist and subspecialist is urged.

EVALUATION

There must be adequate, ongoing evaluation of the knowledge, skills and performance of residents in meeting the six ACGME Competencies (medical knowledge, patient care, professionalism, interpersonal and communications skills, practice-based learning and improvement, systems-based practice.) Evaluation assessment, interim testing and periodic reassessment should utilize appropriate evaluation modalities, including in-training examinations where applicable. There must be a method of documenting the procedures that are performed by the residents. Such documentation must be maintained by the program director(s) to be available for review by the RRC-IM and RRC-MG and the ABIM site visitors and may be used to provide documentation for application for hospital privileges by graduates of the training program.

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 RRCs and the ABIM. Written evaluations of each resident’s knowledge, skills, professional growth and expected level of performance in each of the six competencies using appropriate criteria and procedures, must be accomplished at least semi-annually and must be 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 progression in performance of the six competencies.
Guidelines for Combined Training:  
Internal Medicine/Medical Genetics

The program director(s) is(are) responsible for the maintenance of a permanent record of each resident and its accessibility to the resident and other authorized persons. The training director and faculty are responsible for providing a written final evaluation for each resident who completes the program. This evaluation must include a review of the resident’s performance in meeting the expectations in the six competencies in the final period of training; should verify that the resident has demonstrated sufficient professional ability to practice competently and independently; and is prepared to apply for certification processes of both the ABIM and the ABMG. This final evaluation should be part of the resident’s permanent record and should be maintained by the institution.

The training director(s) should anticipate periodic reviews of the combined training program by site visitors from the ACGME who are reviewing the categorical internal medicine and medical genetics residency programs at the institution. Such reviews will ordinarily include interviews with residents in the combined training pathway. Additionally, the ABIM and the ABMG will conduct periodic paper reviews of the combined training program. Continued approval of the program depends on a successful outcome of the review.

CERTIFICATION

To meet eligibility requirements for the certification process in internal medicine and medical genetics, the resident must satisfactorily complete 60 months of combined training leading to satisfactory performance in the six competencies that is verified by the program directors of the categorical residency programs in internal medicine and medical genetics. Lacking verification of acceptable clinical competence in each specialty, the resident must satisfactorily complete training in either medical genetics or internal medicine. Admission to the certifying examination in internal medicine may be granted after 48 months of training, provided the internal medicine requirements have been satisfactorily met. Admission to the certifying examination in medical genetics may be granted after 48 months of training, providing all of the requirements for medical genetics training have been satisfactorily met.

October 2002