



# **CORE COMPETENCIES IN GENETICS**

## **Introduction**

The Human Genome Project has facilitated a revolution in health care. This revolution is just beginning, but it will have profound implications for optometry and all of health care. One of the most important aspects of this revolution is the paradigm shift from the “old genetics” to the “new genetics.” The old genetics dealt with the rare conditions caused by a mutation in a single gene (monogenic or Mendelian disorders); the new genetics deals with the common multifactorial disorders. This paradigm shift will result ultimately in a gradual change from genetics care being provided almost solely by genetics professionals to genetics care being provided by primary care providers with the assistance of genetics professionals. There will also be a shift from “diagnosis and treatment” to “prediction and prevention.” Thus with time, genetic medicine and genetic optometry will play a larger and larger role in the practice of future medical and optometric physicians. Genetics and the larger field of genomics cut across all areas of medical and optometric practice. This provides a challenge and an opportunity for the profession and for the schools and colleges of optometry. The challenge is to offer the educational foundations for understanding and applying genetics/genomics to optometric students and practicing optometrists. The opportunity is for integrating learning across the many disciplines that make up optometric education. The ability to apply the tremendous amount of information already generated by the genomics revolution to optometric practice is only beginning to materialize. Currently, there are relatively few examples of clinical application. Eventually, the revolution will affect how optometrists understand, classify, diagnose, treat, and manage diseases.

## **Overview**

Many groups have worked on creating core educational guidelines and competencies for their constituencies. These groups include the Association of Professors of Human and Medical Genetics<sup>i</sup>, the American Association of Family Practitioners<sup>ii</sup>, the Association of American Medical Colleges<sup>iii</sup>, the Internal Medicine Residency Training Program Genetics Curriculum Committee<sup>iv</sup>, the American Society of Human Genetics<sup>v</sup>, the American Academy of Nursing<sup>vi</sup>, and the International Society of Nurses in Genetics<sup>vii</sup>. One group has published core competencies for all health care providers: the National Coalition for Health Professional Education in Genetics (NCHPEG)<sup>viii</sup>. In 2003, Optometry recognized its own need to evaluate the implications of genomics, and began a two-year process designed to raise awareness and motivate the generation of curricula appropriate for students and practitioners. A consortium including the Association of Schools & Colleges of Optometry (ASCO), the American Optometric Association (AOA), the American Academy of Optometry (AAO), and industry partners Alcon, Ciba/Novartis, Essilor, and Vistakon/Johnson & Johnson, came together to develop a plan for establishing a set of core competencies deemed appropriate for Optometry. Core competencies are intended to serve as a common foundation for groups involved in designing curricula and presenting educational programs.

## Process

Three ASCO/AOA/AAO genomics working groups were established in December 2004. Utilizing the NCHPEG document “Core Competencies in Genetics Essential for All Health-Care Professionals” as a starting point, they generated core competencies for the education of optometric students and practicing optometrists. The curricular guidelines and core competencies created by other health professions were also extensively consulted. The three working groups addressed competencies in the areas of “Attitudes,” “Knowledge,” and “Skills.” This document is a result of their work and the work of the participants in the Genomics Summit meeting of April 28-29, 2005. It is being distributed for review and consideration by key stakeholders committed to optometric education. Organizations including ASCO, the AOA, the AAO, the Association of Regulatory Boards of Optometry (ARBO), the Council on Optometric Practitioner Education (COPE), the National Board of Examiners in Optometry (NBEO), as well as regional and state associations, and local societies, are encouraged to assess the document’s relevance to their own missions and purpose. It is not intended to be prescriptive, but rather to guide and inform planning.

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<sup>i</sup> Association of Professors of Human and Medical Genetics. Clinical objectives in medical genetics for undergraduate medical students. *Genet Med* 1998;1:54-55.

<sup>ii</sup> AAFP Core Educational Guidelines. Medical genetics. Recommended core educational guidelines for family practice residents. *Am Fam Physician* 1999;60:305-307.

<sup>iii</sup> Association of American Medical Colleges (AAMC). Contemporary Issues in Medicine: Genetics Education (Report issued June, 2004). Available at:

<http://www.aamc.org/meded/msop/msop6.pdf>. Accessibility verified April 25, 2005.

<sup>iv</sup> Riegert-Johnson DL, Korf BR, Alford RL, et al. Outline of a medical genetics curriculum for internal medicine residency training programs. *Genet Med* 2004;6:543-7.

<sup>v</sup> American Society of Human Genetics Information and Education Committee. Report from the ASHG Information and Education Committee: medical school core curriculum in genetics. *Am J Hum Genet* 1995;56:535-537.

<sup>vi</sup> Lea DH. American Academy of Nursing Position Statement: Integrating genetics competencies into baccalaureate and advanced nursing education. *Nursing Outlook* 2002;50:167-8.

<sup>vii</sup> International Society of Nurses in Genetics, Inc. Statement on the scope and standards of genetics clinical nursing practice. Washington, D.C.: American Nursing Association, 1998.

<sup>viii</sup> Core Competency Working Group of the National Coalition for Health Professional Education in Genetics. Recommendations of core competencies in genetics essential for all health professionals. This document is accessible at:

<http://www.nchpeg.org/eduresources/core/Corecomps2005.pdf>. Accessibility verified April 25, 2005.

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# Recommended Core Competencies in Genetics for Doctors of Optometry

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## ATTITUDES

All Doctors of Optometry should appreciate the:

1. cultural, philosophical, theological, and ethical perspectives influencing utilization of genetic information and services
2. sensitivity of genetic information and the need to maintain privacy and confidentiality.
3. importance of providing genetic education, counseling and recommendations, accurately and fairly, without coercion and/or personal bias.
4. importance of sensitivity in tailoring information and services to the patient's culture, knowledge, and language level.
5. indications for multidisciplinary coordination and collaboration with other health professionals.
6. responsibility to address issues that undermine patients' rights to informed decision-making and autonomy.
7. limitations of their genetics expertise and the need to update genetics knowledge and skills at frequent intervals.
8. the responsibility to support patient-focused policies.

## KNOWLEDGE

All Doctors of Optometry should understand:

1. basic human genetics terminology
2. the basic patterns and implications of biological inheritance and variation, both within families and within populations
3. the role of genetic factors in maintaining health and preventing disease
4. how identification of disease-associated genetic variations may facilitate development of prevention, diagnosis, treatment, and management options
5. the expanding range of genetic approaches to management of disease and human health
6. the difference between identification of a genetic predisposition and an actual manifestation of a condition
7. the role of behavioral, social, and environmental factors in influencing genetic predisposition to disease
8. the indications for genetic testing and/or gene-based interventions
9. the resources available to assist patients seeking genetic information or services
10. the components of the genetic counseling process and the indications for referral to genetic specialists
11. the potential physical and/or psychosocial benefits, limitations, and risks of genetic information for individuals, family members, and communities.

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**SKILLS**

All Doctors of Optometry should be able to:

1. take a multi-generational history; construct a minimum of a three-generation pedigree; recognize patterns of inheritance; and do basic genetic risk calculations
2. construct an expanded case history to include environmental/social/behavioral risk factors for targeted populations as they impact on genetic disease
3. perform an ophthalmic examination with special attention to signs and symptoms of genetic disorders
4. identify patients who could benefit from genetic screening, testing, counseling, and support services
5. seek assistance from and refer to appropriate genetics experts and support resources
6. interpret results of genetic tests and explain them to patients and family members
7. explain to patients the basic concepts of probability and disease susceptibility, and the influence of genetic factors in maintenance of health and development of disease
8. obtain informed consent for genetic testing
9. effectively use information technologies to obtain current information about genetics
10. critically assess appropriate literature and other genetics information resources
11. participate in professional and public education programs about genetics to maintain currency of one's own knowledge and to transmit information to others
12. safeguard privacy and confidentiality of patients' genetic information to the greatest extent possible.

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**Contributing Consortium:** *American Academy of Optometry, American Optometric Association and Association of Schools & Colleges of Optometry*

**Industry Supporters:** *Alcon Laboratories, CIBA Vision/Novartis, Essilor Lenses/Varilux and Vistakon/Johnson & Johnson Vision Care, Inc.*

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