	NCHPEG/Jackson Lab Competencies	"entrustable professional activities" EPA Label	ISCC Competencies
Baseline	**all health professionals should be able to**		
Baseline	a. examine one's competence of practice on a regular basis, identifying areas of strength and areas where professional development related to genetics and genomics would be beneficial.	1. Family History	1H2. Maintain continuing medical education on matters of medical genetics
		2. Genomic Testing	2C2. Have a method for periodic review of 'new' genomic interpretation for clinical applications.
		2. Genomic Testing	2H1. Engage in continuing education regarding advances in genomic medicine and changing indications for and interpretation of genomic testing
		3. Patient Treatment Based on Genomic Results	3C3. Incorporate a realistic assessment of personal genomic knowledge and skill in the selection and use of consultants and improve competencies in the wake of these interactions
		3. Patient Treatment Based on Genomic Results	3H1. Maintain the medical knowledge and clinical competence in genomics required for the provision of therapy
		5. Microbial Genomic Information	5C2. Be aware of new genomic testing methods and their clinical applications and apply when appropriate
		5. Microbial Genomic Information	5H1. Maintain up-to-date knowledge on genomic approaches to care for patients with microbial infection
		4. Somatic Genomics	4C1. Maintain an awareness of and follow evidence-based guidelines and other professional resources regarding somatic genetic disorders appropriate to the physician's scope of practice
		4. Somatic Genomics	4H1. Keep up-to-date with progress in the diagnosis and treatment of cancer and other tissue-based disorders
Baseline	b. understand that health-related genetic information can have important social and psychological implications for individuals and families.		
Baseline	c. know how and when to make a referral to a genetics professional.	1. Family History	1G1. Make appropriate referrals for specialty evaluation based on results of family history
		2. Genomic Testing	2A7. Provide referral to an appropriate specialist for genomic testing of a condition outside the physician's scope of practice
		5. Microbial Genomic Information	5G1. Identify appropriate specialists and public health officials who need to be included in the care of the patient with infectious disease and function as a member of the care team
		4. Somatic Genomics	4G1. Make appropriate referrals to specialists and other health providers and support the patient in ongoing care
Knowledge	**All health professionals should understand:**		
Knowledge	1.1 Understand basic human genetics terminology.	2. Genomic Testing	2B1. Describe the major forms of genomic variability
		2. Genomic Testing	2B4. Explain the concepts of analytic validity, clinical validity, clinical utility as they relate to genomic testing
		4. Somatic Genomics	4B1. Explain the concept of somatic genetic change
Knowledge	1.2 Understand the basic patterns of biological inheritance and variation, both within families and within populations.	1. Family History	1A3. Recognize patterns of Mendelian inheritance and calculate simple Mendelian risks; provide this information to patients and family members as appropriate
		1. Family History	1A4. Use empirical risk figures to provide appropriate information for complex (multifactorial) medical conditions
		1. Family History	1A5. Recognize that traits may cluster in families due to multifactorial rather than Mendelian patterns of inheritance
		1. Family History	1B1. Describe the basic patterns of Mendelian inheritance
		1. Family History	1B2. Explain the difference between Mendelian and multifactorial inheritance
		2. Genomic Testing	2B2. Explain how different genomic changes may result in different phenotypes
		3. Patient Treatment Based on Genomic Results	3B1. Appreciate the importance of genetic diversity of humans and the abundance of genetic variants in each individual genome
		5. Microbial Genomic Information	5C3. Maintain awareness of patterns of infection in your patient population and use genomic tests appropriate to these patterns
Knowledge	1.3 Understand how identification of disease-associated genetic variations facilitates development of prevention, diagnosis and treatment options.		
		3. Patient Treatment Based on Genomic Results	3A3. Discern the potential clinical impact of genetic variation on risk stratification and individualized treatment
		3. Patient Treatment Based on Genomic Results	3B2. Identify single-gene disorders that may be amenable to targeted pharmacological therapy
		3. Patient Treatment Based on Genomic Results	3B3. Recognize that genomic test results may guide choice of therapy for multifactorial disorders
		3. Patient Treatment Based on Genomic Results	3B4. Recognize that there is variability in the phenotypic expression of genetic variants and in response to therapy
		3. Patient Treatment Based on Genomic Results	3B5. Recognize that the effects of some medications are strongly influenced by inherited or somatically acquired genetic variation
		4. Somatic Genomics	4B3. Explain how genomic testing can be used to guide choice of therapy and adjust drug dosage in patients with cancer

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Knowledge	1.4 Understand the importance of family history (minimum three generations) in assessing predisposition to disease.	1. Family History	1A6. Formulate an action plan to address relevant family history information
Knowledge	1.5 Understand the interaction of genetic, environmental and behavioral factors in predisposition to disease, onset of disease, response to treatment and maintenance of health.	1. Family History	1D1. Explain and document findings from family history to patient, including implications for other family members
		5. Microbial Genomic Information	5C1. Monitor ongoing testing results and their implications for treatment and prognosis in chronic infection
		4. Somatic Genomics	4B2. Describe the role of genomic changes in the pathophysiology and treatment of cancer
Knowledge	1.6 Understand the difference between clinical diagnosis of disease and identification of genetic predisposition to disease (genetic variation is not strictly correlated with disease manifestation).	2. Genomic Testing	2B3. Recognize that genomic tests require interpretation with respect to the patient's clinical status (e.g., pathogenic, likely pathogenic, benign)
Knowledge	1.7 Understand the various factors that influence the client's ability to use genetic information and services, for example, ethnicity, culture, related health beliefs, ability to pay and health literacy.	2. Genomic Testing	2A5. Explain to the patient issues of costs and financial coverage of genomic testing
		2. Genomic Testing	2F2. Recognize the effects of the costs and coverage of genomic testing on utilization by patients
		3. Patient Treatment Based on Genomic Results	3F1. "Treat the patient who has the disease", i.e., be aware of the patient's needs as an individual who also has a genetic disease or pharmacogenomic variation
Knowledge	1.8 Understand the potential physical and/or psychosocial benefits, limitations and risks of genetic information for individuals, family members and communities.	1. Family History	1E3. Recognize the potential of family history information to reveal unexpected family relationships such as consanguinity or misattributed paternity
		2. Genomic Testing	2B5. Recognize that medically "non-actionable" genomic results can be useful to the patient and family (i.e., personal utility)
		2. Genomic Testing	2D4. Address the needs of the patient as an individual as well as the needs of family members
		3. Patient Treatment Based on Genomic Results	3A2. Recognize that variants affecting drug responses found in a patient may also have implications for other family members
		5. Microbial Genomic Information	5E2. Appreciate the importance of genomic tests for public health and responsibilities of primary-care physicians in reporting results to the appropriate public health authorities
		4. Somatic Genomics	4D4. Communicate to patients potential implications for his/her family
Knowledge	1.9 Understand the resources available to assist clients seeking genetic information or services, including the types of genetic professionals available and their diverse responsibilities.	2. Genomic Testing	2D3. Facilitate access to resources to enhance patient learning about the results of genomic testing
Knowledge	1.10 Understand the ethical, legal and social issues related to genetic testing and recording of genetic information (e.g., privacy and the potential for genetic discrimination in health insurance and employment).	1. Family History	1E2. Explain to patient relevant social and legal risks related to family history as well as relevant legal protections
		2. Genomic Testing	2A1. Discuss the indications for genomic testing – specifically the benefits, risks, and alternatives
		2. Genomic Testing	2A3. Discuss the possibility of incidental findings and how they will be handled
		2. Genomic Testing	2A4. Discuss risks of having genomic testing done, e.g., psychological implications for the individual as well as the family; the potential for discrimination; and the potential effect on insurance coverage
		2. Genomic Testing	2E1. Be aware of and comply with local and federal laws and regulations regarding use of genomic tests
		2. Genomic Testing	2E2. Be aware of and responsive to patients' concerns about genetic discrimination
Knowledge	1.11 Understand one's professional role in the referral to or provision of genetics services, and in follow-up for those services.	1. Family History	1F2. Facilitate patient's desire to communicate relevant family history information among health providers and family members
		2. Genomic Testing	2G3. Maintain a dialog with the clinical laboratory to ensure that the appropriate test(s) are ordered and interpreted in the context of the patient's clinical status
		5. Microbial Genomic Information	5D1. Explain the results of microbial genomic testing to patients
		5. Microbial Genomic Information	5G2. Maintain a dialog with the clinical laboratory to ensure that the appropriate test(s) are ordered and interpreted in the context of the patient's clinical status
		4. Somatic Genomics	4F1. Maintain a dialog with the clinical laboratory to ensure that the appropriate test(s) are ordered and interpreted in the context of the patient's clinical status

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Skills	**All health professionals should be able to:**		
Skills	2.1 Gather genetic family history information, including at minimum a three-generation history.	1. Family History	1A1. Conduct patient interview to assemble family history
		1. Family History	1A2. Use standard pedigree symbols in assembling family history
		1. Family History	1F1. Focus family history on problems relevant to the individual patient's health
Skills	2.2 Identify and refer clients who might benefit from genetic services or from consultation with other professionals for management of issues related to a genetic diagnosis.	3. Patient Treatment Based on Genomic Results	3A.Identify medical conditions and drug responses that have a strong genetic component
		4. Somatic Genomics	4A1. Identify or facilitate identification of patients who may benefit from genomic testing of tissue
Skills	2.3 Explain effectively the reasons for and benefits of genetic services.	3. Patient Treatment Based on Genomic Results	3D1. Discuss benefits, risks, and alternatives of various preventive and therapeutic approaches driven by genomic findings
		5. Microbial Genomic Information	5B1.Explain the core strategies for genomic testing for microbial disease
		5. Microbial Genomic Information	5B2. Describe how DNA or RNA sequence variations in the microbiome may predict response to therapy and clinical outcomes
		4. Somatic Genomics	4A2. Explain the benefits and limitations of somatic genomic testing to the patient, including implications regarding treatment of the condition and clarification of his/her prognosis
		4. Somatic Genomics	4D2. Address any concerns the patient may have about test results
Skills	2.4 Use information technology to obtain credible, current information about genetics.	1. Family History	1H1. Identify sources of information on genetic disorders, such as OMIM (online Mendelian Inheritance in Man), and GeneReviews
		3. Patient Treatment Based on Genomic Results	3C1.Use evidence-based recommendations of professional organizations and others in implementing knowledge gained from genetic discoveries to improve therapeutics
		3. Patient Treatment Based on Genomic Results	3H2. Be familiar with the available databases and resources relevant to genetic variation, including ongoing clinical trials involving patients with genetic disorders, pharmacogenomics, and patient-oriented Internet resources from reliable organizations
Skills	2.5 Ensure that the informed-consent process for genetic testing includes appropriate information about the potential risks, benefits and limitations of the test in question.	2. Genomic Testing	2A2. Explain the implications of placing genomic test results in the patient's medical record
		2. Genomic Testing	2B4. Explain the concepts of analytic validity, clinical validity, clinical utility as they relate to genomic testing
		2. Genomic Testing	2D1. Ensure that undergoing genomic testing is a joint decision of the patient and the physician
		2. Genomic Testing	2F1. Explain who could have access to a patient's genomic information
		5. Microbial Genomic Information	5B3. Explain the potential reasons for false-positive and false-negative microbial genomic-based tests
		4. Somatic Genomics	4A2. Explain the benefits and limitations of somatic genomic testing to the patient, including implications regarding treatment of the condition and clarification of his/her prognosis
		4. Somatic Genomics	4D1. Communicate to the patient the importance of genomic testing of his/her tissue sample, including potential implications for treatment and prognosis, and the limitations of genomic testing
Attitudes	**All health professionals should:**		
Attitudes	3.1 Appreciate the sensitivity of genetic information and the need for privacy and confidentiality.	1. Family History	1E1. Respect privacy of patient and family members in assembling and documenting family history
		2. Genomic Testing	2E3. Respect patient's privacy and need to maintain confidentiality of genomic information
		3. Patient Treatment Based on Genomic Results	3E1. Respect and guard privacy of the patient and the family members
		4. Somatic Genomics	4E1. Ensure that the patient is aware of what will happen with any tissue samples obtained
Attitudes	3.2 Seek coordination and collaboration with an interdisciplinary team of health professionals	2. Genomic Testing	2G1. Initiate responsible referrals to specialists or other health professionals
		2. Genomic Testing	2G2. Provide support to patients based on recommendations of specialists
		3. Patient Treatment Based on Genomic Results	3D2. Communicate clearly with other medical professionals involved in the care of the patient about the therapeutic implications of the genetic information garnered about the patient
		3. Patient Treatment Based on Genomic Results	3G1. Recognize potential involvement of multiple organ systems in genetic disorders and therefore appreciate the need to seek appropriate consultation with experts in the field
		3. Patient Treatment Based on Genomic Results	3G2. Make medical and genetic information available to other health-care professionals, upon obtaining proper consent, while keeping the patients' interests as the primary priority
		5. Microbial Genomic Information	5F1. Work with other health-care professionals to apply infection-control measures when appropriate in both inpatient and outpatient settings
		5. Microbial Genomic Information	5G3. Consult with infectious disease specialists as needed (e.g., to manage unusual or unexpected infection or infection that is highly resistant to treatment)
		4. Somatic Genomics	4D3. Ensure that specialists involved in a patient's care are communicating with one another and with the patient

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	Not associated		
		2. Genomic Testing	2A6. Order, interpret, and communicate the results of appropriate genomic tests, within the physician's scope of practice
		2. Genomic Testing	2A8. Respond to the results of an abnormal genetic screening test, such as newborn screening, including immediate management and appropriate referral
		2. Genomic Testing	2C1. Incorporate genomic findings into the health record and patient-care plan
		2. Genomic Testing	2D2. Explain and document findings from genomic testing to patient, including implications for other family members
		2. Genomic Testing	2F3. Facilitate access of patients to relevant clinical studies or trials based on genomic testing
		5. Microbial Genomic Information	5A1. Use genomic-based tests for infectious disease instead of classical strategies where appropriate (e.g., based on clinical validity and turn-around time)
		5. Microbial Genomic Information	5A2. Appreciate the sensitivity and specificity of genomics-based tests for diagnosis of infectious disease based on the clinical presentation, suspected pathogen type, and testing method
		3. Patient Treatment Based on Genomic Results	3C2. Document and periodically reassess therapeutic decision making in the medical record of patients
		3. Patient Treatment Based on Genomic Results	3D3. Discuss pharmacogenomics implications for future health
		5. Microbial Genomic Information	5A3. Interpret genomics-based tests for diagnosis, monitoring, and treatment of infectious disease
		5. Microbial Genomic Information	5B4. Explain the importance of "normal" microbiome to health and disease
		5. Microbial Genomic Information	5D2. Explain to patients and families results that signal a risk for contagion and take appropriate containment steps
		5. Microbial Genomic Information	5E1. Provide guidance to patients on how to avoid transmission of microbial agents in the community
		5. Microbial Genomic Information	5F2. Reassure patients and health-care workers in those situations in which "infection control" is not indicated
		4. Somatic Genomics	4A3. Ensure that tissue biopsy procedures are coordinated to make certain that appropriate and sufficient material is obtained for testing
		4. Somatic Genomics	4A4. Integrate genomic testing results into the patient-care plan
		4. Somatic Genomics	4F2. Be prepared to refer patients to clinical trials designed to evaluate new approaches to cancer therapy
	Categories missing?		
	Incorporating genetic information into charts or reading genetic information in patient records		
	Facilitating interdisciplinary and interprofessional communication		
	Responding to patient inquiries regarding genetic information		
	Connecting patients to clinical trials and research opportunities		