Integration of Physician Assistant Genomic Competencies into the Curriculum

CONSTANCE GOLDGAR, MS, PA-C
UNIVERSITY OF UTAH PHYSICIAN ASSISTANT PROGRAM
DEPARTMENT OF FAMILY AND PREVENTIVE MEDICINE

Objectives

- Discuss competency-based genetics/genomics medical education framework and its application to the continuum of health professional training
- Outline possible approaches to designing curricula and training activities that assess genetics/genomics competence for physician assistants (PA)
- Provide resources relevant to PA competence in genetics/genomics

New Language of Medical Education

World of transforming medical education

- CBME, competencies, competency-based education
- Continuum of health professional/practitioner education
- Overlap of competencies will and should be occurring within healthcare team members
- EPAs = entrustable professional activities
  - EPAs are descriptors of work
  - Help to translate competencies into clinical practice
  - Observable during training and in practice
  - Many competencies may be integrated within an EPA

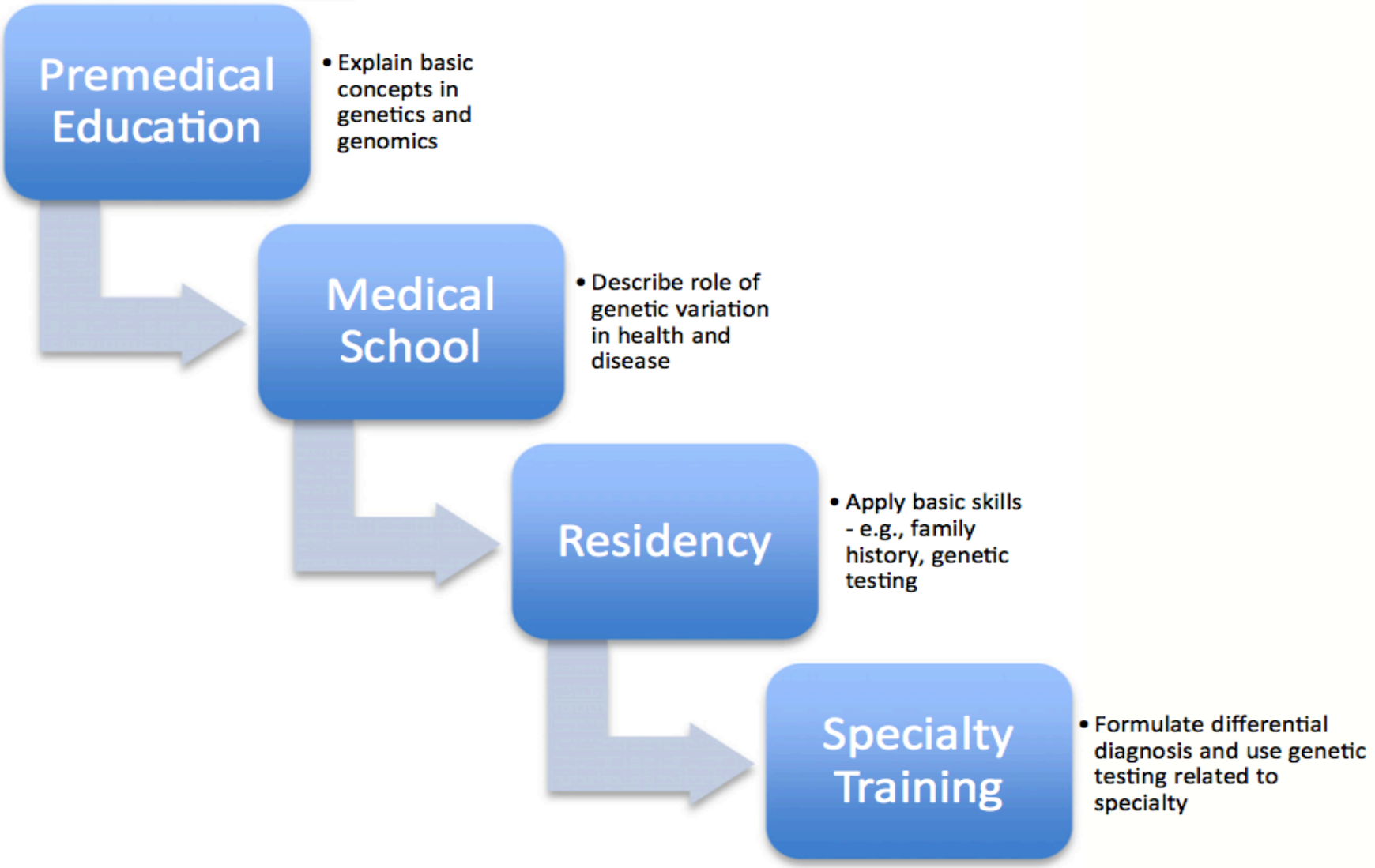


Figure. Progression of competency in genetics/genomics from premedical education through specialty training.

From Korf B: Molecular Genetics & Genomic Medicine, 2013.

Newly Proposed PA Genomic Competencies (2016)

- Based on the 8 ACGME Domains:
  - Patient Care
  - Medical Knowledge for Practice
  - Interpersonal and Communication Skills
  - Practice-Based Learning and Improvement
  - Professionalism
  - Interprofessional Collaboration
  - Systems Based Practice
  - Personal and Professional Development

Newly Proposed PA Genomic Competencies (2016)

Patient Care

1. Gather family history information and construct a multigenerational pedigree.
2. Identify patients who would benefit from referral to genetics professionals.
3. Distinguish between genetic screening and genetic testing.
4. Incorporate genetic tests into patient management.
5. Discuss the range of genetic and genomic-based approaches to the treatment of disease.

Medical Knowledge for Practice

1. Describe the cellular and molecular mechanisms underlying human inheritance.
2. Define the role of genetic variation in health and disease.

Professionalism

1. Examine on a regular basis one's competence in genomics pertinent to one's practice setting.

Interpersonal and Communication Skills

1. When communicating genetic information to patients, consider personal factors that may influence their understanding and response.
2. Explain the role of genetics professionals in the patient-care plan.
3. Promote informed decision making for patients, and provide nondirective counseling.
4. Offer appropriate psychological and social support to patients and families affected by a genetic condition.

Practice Based Learning & Improvement

1. Use information technology to obtain current and credible information about genetics for self, patients, and colleagues.

Interprofessional Collaboration

1. Seek coordination and collaboration with an interprofessional team of health care providers.

Systems-Based Practice

1. Identify key aspects of health care systems as they apply to clinical genetics.

What might "genomic" EPAs look like?

From: Competencies Working Group of the Inter-Society Coordinating Committee for Physician Education in Genomics identified 5 EPAs that comprise a basic set of genomic skills

1. Family History: elicit, document, and act on relevant family history pertinent to the patient's clinical status;
1. Genomic Testing: use genomic testing to guide patient management;
2. Treatment Based on Genomic Results: use genomic information to make treatment decisions;
1. Somatic Genomics: use genomic information to guide the diagnosis and management of cancer and other disorders involving somatic genetic changes;
1. Microbial Genomic Information: use genomic tests that identify microbial contributors to human health and disease, as well as genomic tests that guide therapeutics in infectious diseases.

From: Korf B et al. *Genetics in Medicine 2014;16 (11): 805-809.*

EPA 1—Family History: elicit, document, act on relevant family history pertinent to the patient's clinical status

SUB-COMPETENCIES

1. Gather family history information and construct a multigenerational pedigree.
2. Identify patients who would benefit from referral to genetics professionals.
3. Incorporate genetic tests into patient management.
4. Discuss the range of genetic and genomic-based approaches to the treatment of disease.
5. When communicating genetic information to patients, consider personal factors that may influence their understanding and response.
6. Explain the role of genetics professionals in the patient-care plan.
7. Promote informed decision making for patients, and provide nondirective counseling.
8. Offer appropriate psychological and social support to patients and families affected by a genetic condition.
9. Use information technology to obtain current and credible information about genetics for self, patients, and colleagues.

DOMAIN

Patient Care

Interpersonal and Communication Skills

Practice Based Learning & Improvement

EPA 2—Genomic Testing: use genomic testing to guide patient management

SUB-COMPETENCIES

1. Incorporate genetic tests into patient management.
2. Identify patients who would benefit from referral to genetics professionals.
3. Distinguish between genetic screening and genetic testing.
4. When communicating genetic information to patients, consider personal factors that may influence their understanding and response.
5. Promote informed decision making for patients, and provide nondirective counseling.
6. Seek coordination and collaboration with an interprofessional team of health care providers.
7. Use information technology to obtain current and credible information about genetics for self, patients, and colleagues.

.

DOMAIN

Patient Care

Interpersonal and Communication Skills

Practice Based Learning & Improvement

EPA 3—Treatment Based on Genomic Results: use genomic information to make treatment decisions

SUB-COMPETENCIES	DOMAIN
1. Discuss the range of genetic and genomic-based approaches to the treatment of disease.	Patient Care
2. Explain the role of genetics professionals in the patient-care plan.	
3. When communicating genetic information to patients, consider personal factors that may influence their understanding and response.	Interpersonal & Communication Skills
4. Promote informed decision making for patients, and provide nondirective counseling.	
5. Offer appropriate psychological and social support to patients and families affected by a genetic condition.	
6. Use information technology to obtain current and credible information about genetics for self, patients, and colleagues.	Practice Based Learning & Improvement
7. Examine on a regular basis one's competence in genomics pertinent to one's practice setting.	Professionalism

What about these proposed EPAs?

EPA 4. Somatic Genomics: use genomic information to guide the diagnosis and management of cancer and other disorders involving somatic genetic changes

EPA 5. Microbial Genomic Information: use genomic tests that identify microbial contributors to human health and disease, as well as genomic tests that guide therapeutics in infectious diseases

How can we use competencies to guide curriculum development?

AND WHAT MIGHT A COMPETENCY-BASED MEDICAL GENOMICS CURRICULUM LOOK LIKE?

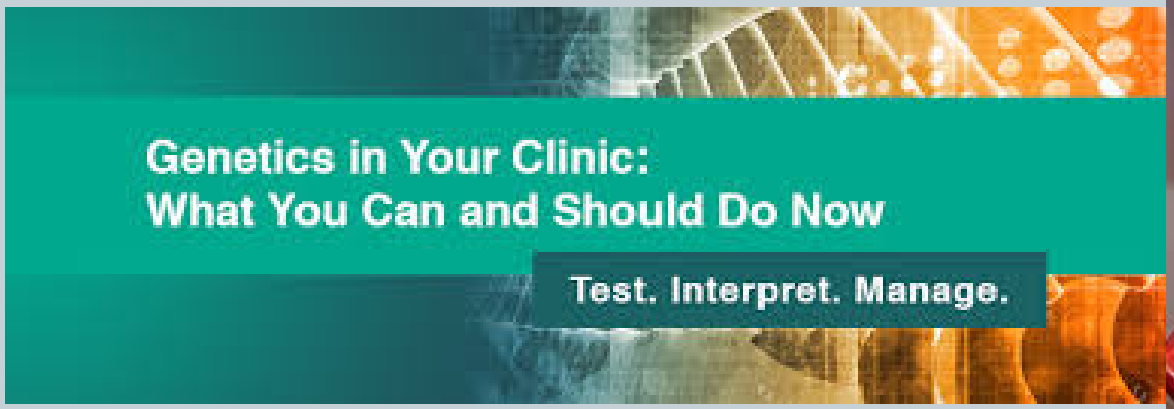
Before EPAs can be assessed, what foundation do PA students need?

Competency: Knowledge for Practice

- Genomic terminology/nomenclature
  - e.g., genetics, genomics, modes of inheritance (Mendelian/non-Mendelian), complex multifactorial inheritance, phenotype/genotype…
- Cellular and molecular mechanisms underlying human inheritance
  - e.g., genes, alleles, somatic vs. germline mutations, penetrance, polymorphism, SNPs…
- Role of genetic variation in health and disease
  - e.g., pharmacogenetics, "precision medicine," personalized preventive medicine, common disease risk prediction…

Korf on genetics in the curriculum

- "If there is a deficiency it is more likely that concepts are taught with no mention of their clinical relevance. No basic scientific discipline lends itself better to melding of fundamental principles and clinical applications than genetics…"



Practice-relevant competencies

birth defects
blood disorders

diabetes
depression

Alzheimer's disease
osteoporosis

infants | children | adolescents | adults | older adults

asthma
autism

cancer
heart disease

Competency: Patient care

- Gather family history to create a pedigree
- Assess the pedigree for risk
- Differentiate genetic screening from testing
- Incorporate genetic tests appropriate to setting into patient care

- Curriculum
  - Role play taking a family history, while students construct a pedigree
  - Students take a family history, constructing their own standardized family pedigree
  - Students take a family history from a patient in clinic, constructing a pedigree and working through risk interpretation

Competency: Patient care (cont)

- Differentiate genetic screening from testing
- Incorporate genetic tests appropriate to setting into patient care

- Curriculum
  - Remind students in courses that many tests that they order can reveal familial/genetic information (e.g., cholesterol testing)—use in MCQ exams or case-based learning
  - Patient cases in small group learning and/or OSCEs that include differential dx of a genetic condition requiring consideration of genetic testing (e.g., Fragile X for developmental delay, familial hypercholesterolemia)

Competency: Interpersonal & communication skills

- Communicating genetic information to patients
- Role of genetic professionals in care plan
- Informed decision-making, non-directive counseling
- Offer psych and social support to families

- Curriculum
  - Have students work through real-life scenarios that involve communicating genetic information patients in small groups
    - Discuss the unique nature and added complexity of communicating genetic information
    - Role play and/or OSCEs involving educating patients about referral to genetic professionals, or support resources for those with diagnoses

Competency: Practice-based learning & improvement

- Use information technology to obtain current and credible information about genetics for self, patients, and colleagues
- Curriculum
  - For pedigree risk interpretation, have students locate valid resources for genetic information, including anticipatory, primary-care oriented management, where they can find genetic counselors and genetic testing labs
  - Assessment can be combined with activities in Interpersonal & Communication skills (e.g., cases, OSCEs)

Competency: Professionalism

- Examine on a regular basis one's competence in genetics/genomics as pertinent to one's practice setting.
- Discuss financial, ethical, legal, and social issues related to genetic testing and recording of genetic information.

- Curriculum
  - Integrate with Interpersonal & Communication Skills activities
  - Use patient cases to:
    - Demonstrate ethical principles—discuss confidentiality, privacy, informed consent in small groups
    - Discuss: 1) "Genetic exceptionalism" and use/misuse of information; ask how arguments can extend to racial, ethnic, and other groups; 2) "Duty to Warn"—how to communicate to patients and their families, when are breaches of confidentiality warranted?

Competency: Interprofessional Collaboration

- Seek coordination and collaboration with an interprofessional team of health care professionals
- Curriculum
  - Integrate with Interpersonal & Communication Skills activities—e.g., role play in small group case-based scenarios and/or OSCEs
  - Have genetic counselors discuss their roles (in their varied expertise) and what happens during a counseling session with patients
    - Genetic counselors sometimes have patients who are willing to discuss their journey through the medical system with Q&A with students

Competency: Systems-based practice

- Identify key aspects of health care systems as they apply to clinical genetics.

- Curriculum
  - Case-based or clinic-based reflections on scenarios:
    - e.g., a patient with a new genetic diagnosis—have students research & discuss who could have access to a patient's genomic information (e.g., 1st degree family members, insurance companies, employers)
    - Students research the costs and insurance coverage of BRCA1 testing
    - In primary care rotation, students report a population(s) that could benefit from genetic screening; discuss the education needed, the availability, and the impact of health disparities and/or access for patients.

Various permutations of genomic curricula at the University of Utah PA program…

- Attempt to integrate genomics into organ system courses plus a Medical Genomics Course—*too difficult to ask adjunct instructors to integrate*
- Straight Medical Genetics/Genomics Course without integration *per se* into organ systems—*makes genomics look like an "add-on"*
- Medical Genomics Course mapping to competencies plus integration into courses (current) and clinical year—*just right?*

Current Curriculum—"Foundational"

- Medical Genetics Course
  - Basics with online modules and quizzes
  - Family history
    - Gathering a family history and constructing a pedigree (and assignments)
    - Risk interpretation of family history and pedigree gathered from a patient in the clinical year
  - ELFSI & genetic testing with discussions
    - Interactive class with case scenarios
    - Genetic counselor panel and/or patient with genetic condition
  - Cases in small groups and/or OSCEs
    - Bring genetic conditions into differential diagnoses of cases
    - Role plays of various competencies—e.g., ICS, PBLI

Current Curriculum—Integration into Courses

- Cardiovascular
- Endocrinology
- ENT
- Gastroenterology
- Geriatrics
- Hematology
- Musculoskeletal
- Nephrology
- Neurology
- OB/GYN
- Oncology
- Ophthalmology
- Pediatrics
- Psychiatry
- Pulmonology
- Therapeutics
- Urology

Integration into courses (examples)

Cardiovascular learning objectives:

1. Explain the genetics and inheritance of familial arrhythmias, cardiomyopathies, and aortopathies
2. Describe the genetic complexity and clinical utility of genetic testing for familial cardiovascular conditions
3. Identify key clues of a personal or family history that would warrant an appropriate referral to a genetics clinic/genetic counselor

Pediatric learning objectives:

1. Recognize and describe characteristic features and inheritance patterns of more common pediatric genetic syndromes
2. Assess when referral for genetic evaluation is warranted based on phenotype and/or family history
3. Understand and apply medical management recommendations for long-term patient and family care

Integration into Courses (examples)

Cardiovascular

- Genetic red flags in family hx alerting possible CV genetic issues; what to ask
- CV-specific conditions:
  - Cardiomyopathies
  - Long QT syndrome
  - Brugada syndrome
  - Syndromic familial aneurysms
  - Familial hypercholesterolemia

Pediatrics

- Pediatric genetic evaluation
- Specific pediatric issues:
  - Chromosomal abnormalities
  - Congenital anomalies
  - Syndromes (common)
  - Sequence/Association
  - Newborn screening
  - Inborn errors of metabolism
  - Birth defects

Bring genetic thinking to clinical training!

- Competencies can be assessed developmentally throughout the curriculum
  - Assignments—e.g., pedigree construction and interpretation
  - Exams
    - MCQ exams for foundational knowledge for practice
    - OSCEs can examine knowledge, patient care proficiencies, interpersonal and communication skills, professionalism
  - Genetics is a perfect opportunity to explore discussions and reflections demonstrating ethical reasoning and systems
- More difficult to assess EPAs for genetics in PA training during clinical preceptorships

Questions?