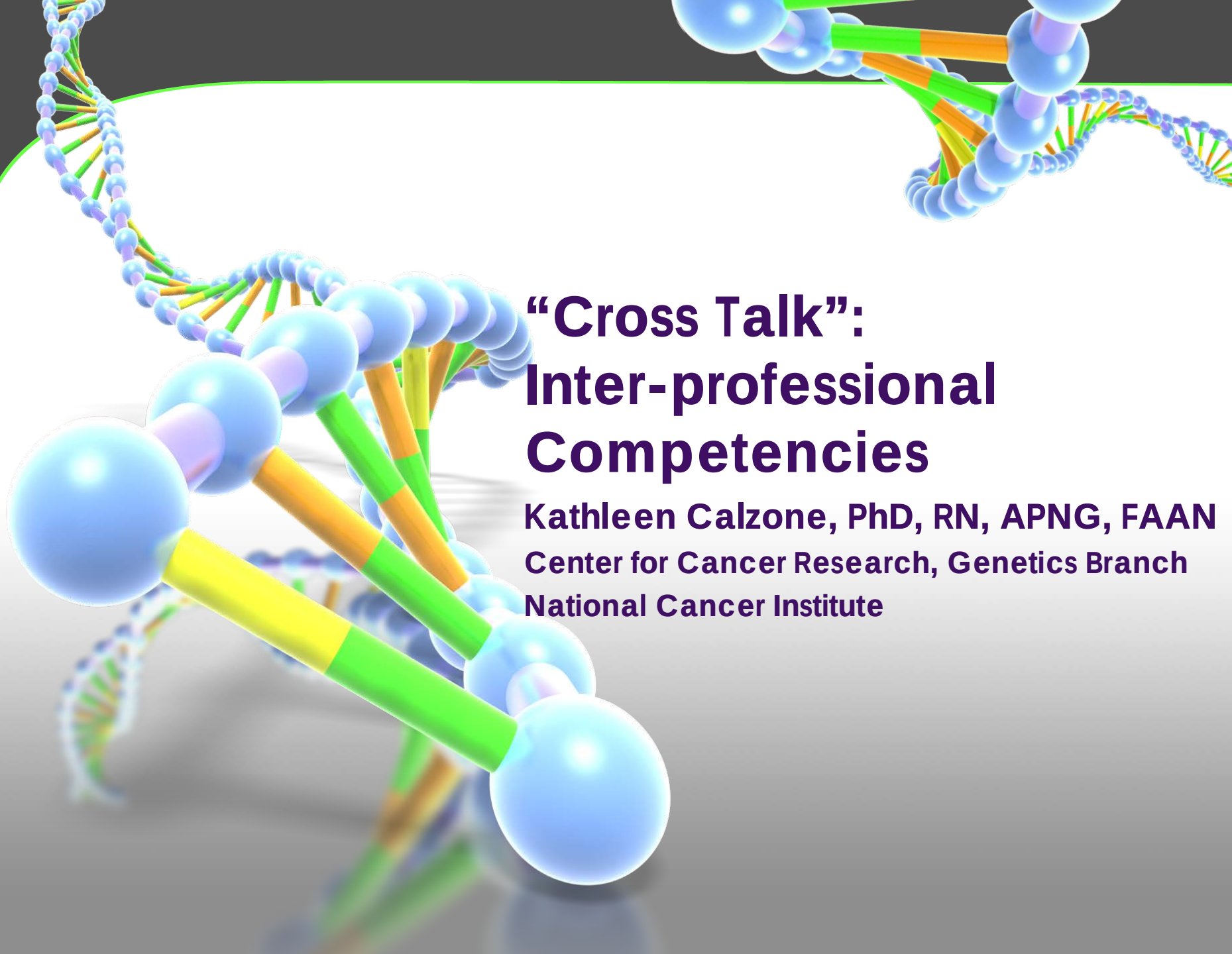

“Cross Talk”: Inter-professional Competencies

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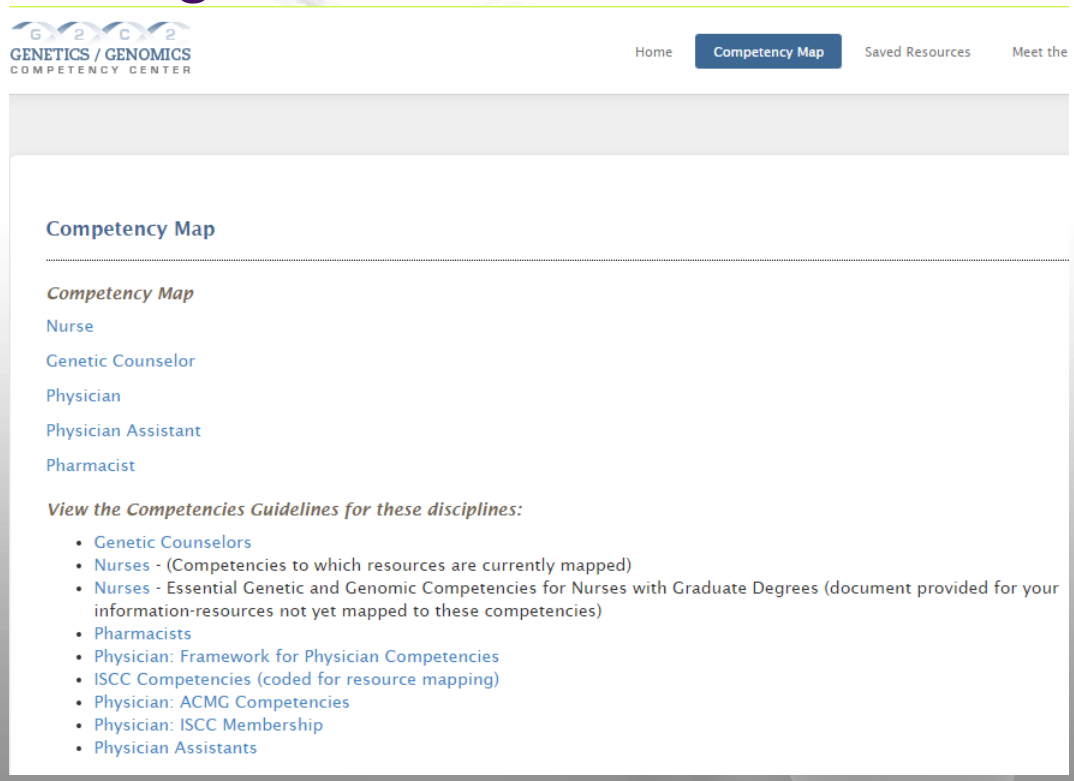
Competency

- An observable, measurable, performance-based outcome that indicates the achievement of a particular knowledge component, application, or demonstration of a psychomotor behavior or skill

Greco, K.E., et al. *Essential genetic and genomic competencies for nurses with graduate degrees*. 2012 [cited 2012 5/22/2012]; Available from: http://www.nursingworld.org/MainMenuCategories/EthicsStandards/Genetics-1/Essential-Genetic-and-Genomic-Competencies-for-Nurses-With-Graduate-Degrees.pdf

Genomic Competencies for Non-Genetic Specialist Healthcare Providers

- Nurses
- Nurses with Graduate Degrees
- Genetic Counselors
- Physician Assistants
- Pharmacists
- Physicians



http://g-2-c-2.org/competency

Other Health Professionals Establishing Genomic Competencies

- Pathologists
  - Working group formed by College of American Pathologists
    - Developed initial list of knowledge and skills needed by practicing pathologists
    - Genomic expert review and rating of importance
    - Workgroup subset defined final competency subtopics and tasks
      - Appropriate delivery methods for educational material were suggested

Laudadio et al. (2015). Design of a genomic curriculum: Competencies for Practicing Pathologists. APLM, 139, 894-900.

Competency Based Learning

- Health problems to be addressed
- Requisite competencies required for health system performance
- Assess achievements and shortfalls

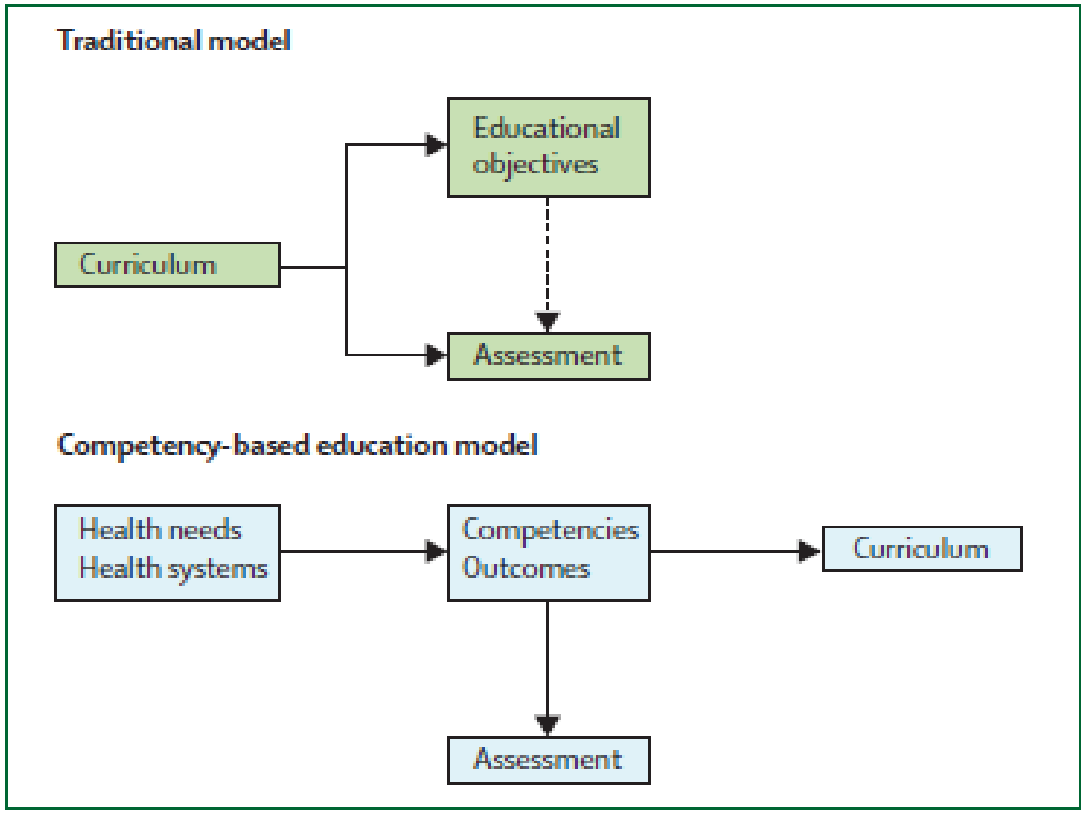


Figure 9: Competency-based education

Frenk, J., et al. (2010). Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. Lancet, 376, 1923-1958.

Consensus Statement on a Framework for Professional Competence

- Mastery of the competencies is developmental
  - Academic preparation onwards
- Performance may improve with practice
  - Training and clinical practice
- Competence may decline over time
- Pace of growth will vary between individuals and vary based on the specific competency

Coalition for Physician Accountability. Consensus statement on a framework for professional competence http://www.physicianaccountability.org/pdf/Coalition_Competencies_Consensus_Statement.pdf

Consensus Statement on a Framework for Professional Competence

- Six Domains of Competence
  - Professionalism
  - Medical Knowledge
  - Patient Care and Procedural Skills
  - Interpersonal and Communication Skills
  - Practice-based Learning
  - Improvement, and System-based Practice
- Provide a framework for the continuous improvement of physician competence relevant to scope of practice and patient needs

Coalition for Physician Accountability. Consensus statement on a framework for professional competence http://www.physicianaccountability.org/pdf/Coalition_Competencies_Consensus_Statement.pdf

Domain Cross Talk

Physician	Physician Assistant	Nurse	Pharmacists
Practice Based Learning and Improvement, Interpersonal and Communication Skills, Professionalism, Inter-professional Collaboration, Personal and Professional Development	Knowledge, Attitudes	Professional Responsibilities	Knowledge: Basic Genetic Concepts, Genetics And Disease, Pharmacogenomics/ Pharmacogenetics, Ethical, Legal and Social Implications
Patient Care, Systems Based Practice	Skills	Professional Practice: Assessment Identification Referral Activities Provision of Education Care and Support	

Basic Genetic/Genomic Concepts

	Competency
Nurses	Demonstrates an understanding of G/G to health, prevention, screening, diagnostics, prognostics, selection of treatment and monitoring of treatment effectiveness.
Nurses with Graduate Degrees	Integrate best G/G evidence into practice that incorporates values and clinical judgment.
Physician Assistants	Recognize the genetic and environmental contribution to multi-faceted conditions (e.g. congenital heart disease, cancer, hypertension, diabetes, psychiatric illness)/.
Pharmacists	To identify drug and disease associated genetic variations that facilitate development of prevention, diagnostic, and treatment strategies and appreciate there are differences in testing methodologies and are aware of the need to explore these differences in drug literature evaluation.
Physicians	Discern the potential clinical impact of genetic variation on risk stratification and individualized treatment.

Referrals

	Competency
Nurses	Identifies clients who may benefit from specific genetic and genomic information and/or services based on assessment data. Facilitates referrals for specialized genetic and genomic services for clients as needed.
Nurses with Graduate Degrees	Refer at-risk family members for assessment of inherited predisposition to disease. Make appropriate referrals to genetic professionals or other health care resources.
Physician Assistants	Identify and appropriately determine referral of patients who would benefit from genetic services, e.g. recognition of dysmorphic features, genetic “red flags” in family histories.
Pharmacists	To identify the need to refer a patient to a genetic specialist or genetic counselor.
Physicians	Make appropriate referrals for specialty evaluation based on results of family history.

Ethical, Legal, and Social Issues

	Competency
Nurses	Identifies ethical, ethnic/ancestral, cultural, religious, legal, fiscal, and societal issues related to genetic and genomic information and technologies.
Nurses with Graduate Degrees	Implement effective strategies to resolve ethical, legal, and social issues related to genetic/genomics.
Physician Assistants	Consider the influence of ethnicity, culture, related health beliefs, economics, and health literacy in the patient's ability to use genetic information and services.
Pharmacists	To adopt a culturally sensitive and ethical approach to patient counseling regarding genomic/pharmacogenomic test results.
Physicians	Explain to patient relevant social and legal risks related to family history as well as relevant legal protections.

Competency Considerations

- Limited healthcare workforce genomic knowledgebase
  - Novel strategies for education given the current fiscal climate
- Infrastructure needed to integrate genomics into healthcare delivery systems
  - Policies
  - Electronic health record (EHR)
  - Point of care decision support
- Business/financial plan
  - Return on investment

Genomics and Interprofessional Education

FIGURE 4: Barr's (1998) three types of professional competencies

Core Competencies for Interprofessional Collaborative Practice. https://ipecollaborative.org/uploads/IPEC-Core-Competencies.pdf

Competency Based Learning

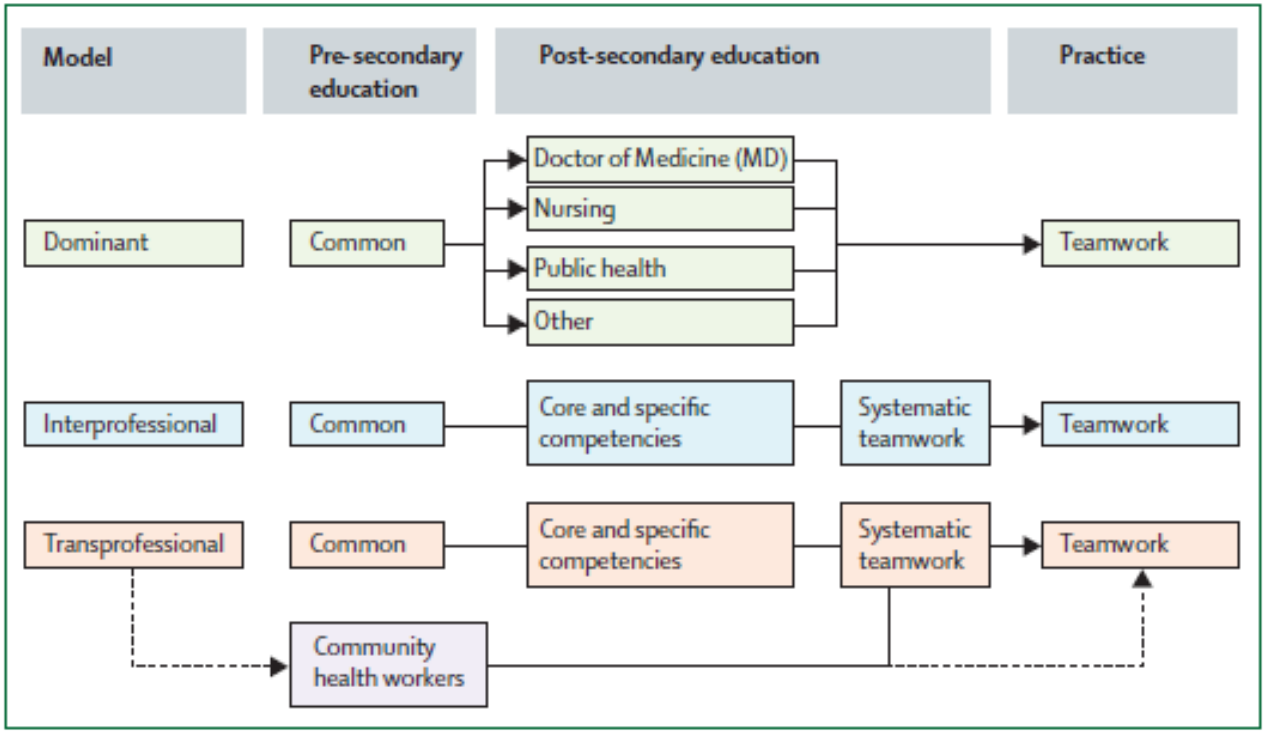


Figure 10: Models of interprofessional and transprofessional education

- Interprofessional: ≥ 2 professions learning together
- Transprofessional : non health professional workers i.e. policy makers, administrators, ancillary staff, payors, community leaders

Frenk, J., et al. (2010). Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. Lancet, 376, 1923-1958.

Genomics and the Nursing Workforce

Study	N
National Nursing Workforce Study in collaboration with ANA (NNWF)	619
ANA House of Delegates (HOD)	244
National Coalition of Ethnic Minority Nurses (NCEMNA)	389
Expanding RN Scope of Practice: A Method for Introducing a New Competency into Nursing Practice (MINC)	7798

Calzone, K. et al. (2013). National Nursing Workforce Survey of Nursing Attitudes, Knowledge and Practice in Genomics. Personalized Medicine, 10, 719-728.

Badzek et al. (2013). National Nursing Leadership Survey of Attitudes, Knowledge, and Competency in Genomics. American Nurse Today, 8.

Coleman, B., et al. (2014). Multi-Ethnic Minority Nurses' Knowledge and Practice of Genetics and Genomics. Journal of Nursing Scholarship. 46, 235-44.

Calzone, K., et al. (2014). Expanding RN Scope of Practice: A methods for introducing a new competency into nursing practice. Journal of Nursing Regulation

Family History

Question	NNWFS	NCEMNA	MINC
Not at all or only a little confident in deciding what family history information is needed to identify genetic susceptibility to common diseases.	41% (n=227/551)	NA	52% (n=3313/6000)
Not at all or only a little confident in deciding which patients would benefit from a referral for genetic counseling and possible testing.	54% (n=298/553)	NA	64% (n=3837/5962)
Always Collect:			
Relationship to the patient	83% (n=403/483)	91% (n=330/364)	72% (n=4010/5591)
Age of diagnosis	41% (n=200/483)	64% (n=231/361)	29% (n=1617/5566)
Maternal and paternal lineages	66% (n=320/484)	77% (n=278/359)	53% (n=2953/5551)
Race or ethnic background	49% (n=233/477)	77% (n=242/315)	33% (n=1819/5533)

Family History

	In the prior three months nurses seeing patients who RARELY OR NEVER assessed a family history	AGREED OR STRONGLY AGREED that family history taking should be a key component of nursing care
NNWFS	67%, (n=288/510)	84% (n=369/442)
HOD	58% (n=59/102)	91% (n=219/242)
MINC	65% (n=3193/4923)	71% (n=4204/5942)

Physician Healthcare Provider Knowledge

Stanek et al. 10,303 US physicians

- 98% agreed that genetic variation may influence drug response
- 10% felt adequately informed about pharmacogenomic (PGx) testing
- 85% had no PGx education in medical school
- 77% had no PGx in post grad training
- 29% had received PGx education

Stanek, EJ et al. Adoption of pharmacogenomic testing by US physicians: results of a nationwide survey. CPT, 91, 450-8.

Physician Healthcare Provider Knowledge

Stanek et al. 10,303 US physicians

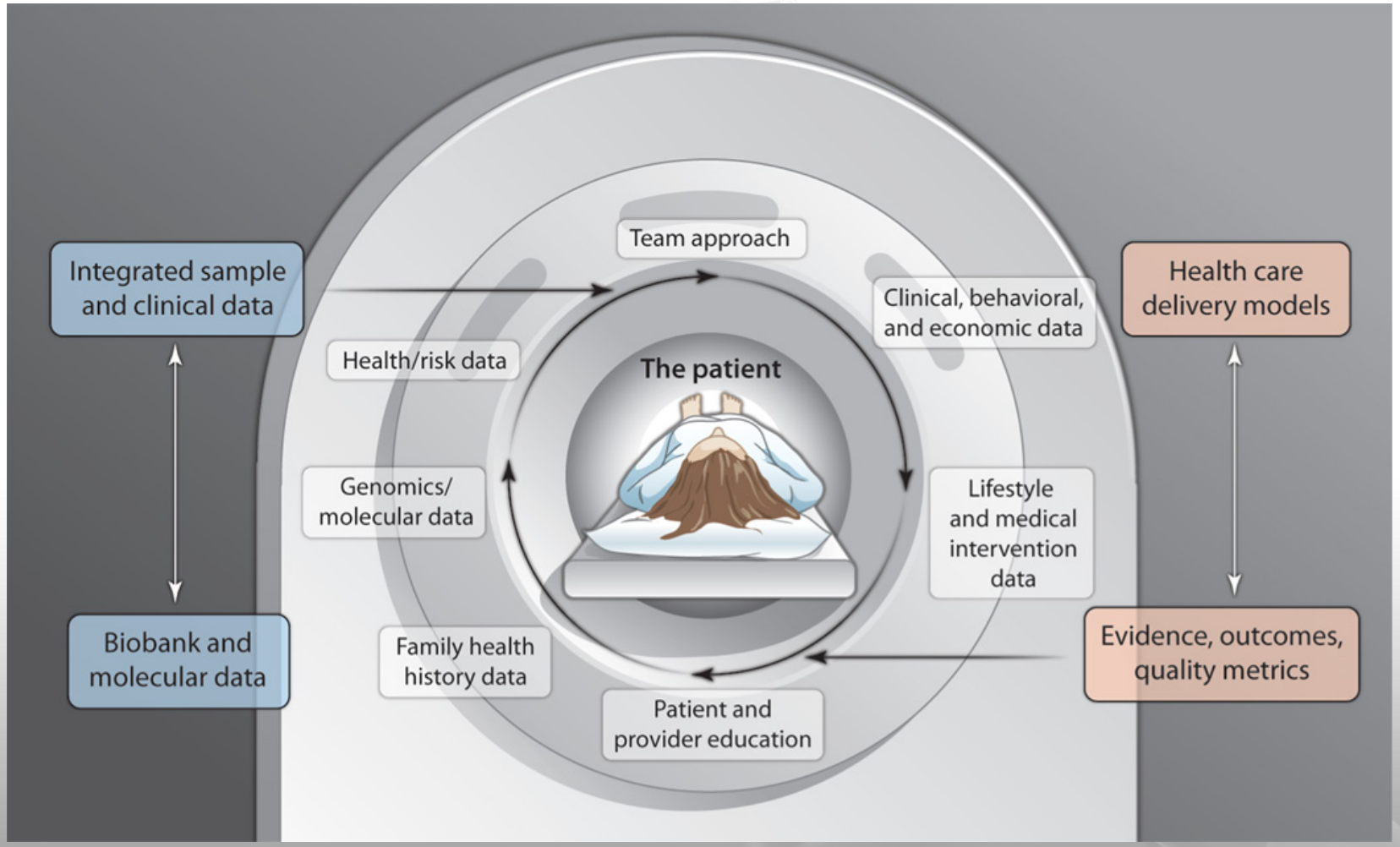
- MDs with prior PGx education were more likely to have ordered PGx tests (OR1.63, 95% CI 1.34–1.97, $P < 0.001$)
- MDs who felt well informed about the availability and applications of PGx were more likely more likely to order PGx testing (OR 1.92, 95% CI 1.51–2.45, $P < 0.001$)

Stanek, EJ et al. Adoption of pharmacogenomic testing by US physicians: results of a nationwide survey. CPT, 91, 450-8.

The Inter-Society Coordinating Committee for Practitioner Education in Genomics (ISCC)

- Coalition of 58 interprofessional organizations
  - Competencies in Genomic Medicine
  - Case Studies
    - Mitochondrial DNA mutation A1555G and aminoglycoside-induced hearing loss and deafness
    - Utilizing family history to identify Lynch Syndrome
  - Insurer Staff Education
    - Identify areas of greatest need for genomics knowledge in the clinical context among the staff and medical directors of health insurers' claims and preauthorization processing pipelines
    - Execute a pilot webinar series to educate insurer staff, and gather effectiveness data iteratively

Personalized Health Care Requirements



Ginsburg G S et al. Sci Transl Med 2011;3:101cm27-101cm27

Science Translational Medicine
AAAS

Questions/Discussion

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301-435-0538