

## **Chapter 2**

### **Basic Concepts in Genetics and Genomics: Part of Every Type of Nursing Practice**

#### **Objectives:**

1. Outline basic concepts of genetics and genomics in nursing practice.
2. Identify differences in the knowledge base and skills needed to incorporate basic concepts in genetics and genomics into every type of nursing.
3. Identify intervention strategies that promote health and/or prevent disease in genetically high-risk populations.

#### **I. ESSENTIAL GENETIC AND GENOMIC COMPETENCIES FOR ALL REGISTERED NURSES**

**A. Independent panel of nurse leaders from clinical, research and academic settings**

**B. Establish minimum basis of the nursing workforce to deliver competent genetic- and genomic-focused nursing care**

**C. All diseases and conditions have some genetic or genomic component**

**D. 27 competencies in 5 major categories**

- 1) Professional responsibilities
  - (a) Recognize when one's own attitudes and values related to genetic and genomic science may affect care provided to clients
  - (b) Advocate for clients' access to desired genetic/genomic services and/or resources, including support groups
  - (c) Examine competency of practice on a regular basis, identifying areas of strength, as well as areas in which professional development related to genetics and genomics would be beneficial
  - (d) Incorporate genetic and genomic technologies and information into registered nurse practice

- (e) Demonstrate in practice the importance of tailoring genetic and genomic information and services to clients based on their culture, religion, knowledge level, literacy, and preferred language
  - (f) Advocate for the rights of all clients for autonomous, informed genetic- and genomic-related decision-making and voluntary action
- 2) Nursing Assessment: Applying/Integrating Genetic and Genomic Knowledge
  - (a) Demonstrates an understanding of the relationship of genetics and genomics to health, prevention, screening, diagnostics, prognostics, selection of treatment, and monitoring of treatment effectiveness
  - (b) Demonstrates ability to elicit a minimum of three-generation family health history information
  - (c) Constructs a pedigree from collected family history information using standardized symbols and terminology
  - (d) Collects personal, health, and developmental histories that consider genetic, environmental, and genomic influences and risks
  - (e) Conducts comprehensive health and physical assessments that incorporate knowledge about genetic, environmental, and genomic influences and risk factors
  - (f) Critically analyzes the history and physical assessment findings for genetic, environmental, and genomic influences and risk factors
  - (g) Assesses clients' knowledge, perceptions, and responses to genetic and genomic information
  - (h) Develops a plan of care that incorporates genetic and genomic assessment information
- 3) Emerging Evidence
  - (a) Identifies clients who may benefit from specific genetic and genomic information and/or services based on assessment data
  - (b) Identifies credible, accurate, appropriate, and current genetic and genomic information, resources, services, and/or technologies specific to given clients
  - (c) Identifies ethical, ethnic/ancestral, cultural, religious, legal, fiscal, and societal issues related to genetic and genomic information and technologies
  - (d) Defines issues that undermine the rights of all clients for autonomous, informed genetic- and genomic-related decision making and voluntary action
- 4) Referral Activities
  - (a) Facilitates referrals for specialized genetic and genomic services for clients as needed

- 5) Provision of Education, Care, and Support
  - (a) Provides clients with interpretation of selective genetic and genomic information or services
  - (b) Provides clients with credible, accurate, appropriate, and genetic and genomic information, resources, services, and/or technologies that facilitate decision making
  - (c) Uses health promotion and disease prevention practices that
    - (i) Consider genetic and genomic influences on personal and environment risk factors
    - (ii) Incorporate knowledge of genetic and or genomic risk factors
  - (d) Uses genetic- and genomic-based interventions and information to improve clients' outcomes
  - (e) Collaborates with health care providers in providing genetic and genomic health care
  - (f) Collaborates with insurance providers/payers (and other financial resources) to facilitate reimbursement for genetic and genomic health care services
  - (g) Performs interventions/treatments appropriate to clients' genetic and genomic health care needs
  - (h) Evaluates impact and effectiveness of genetic and genomic technology, information, interventions, and treatments against clients' outcome

## **II. NURSING COMPETENCIES FOR COMMUNITY HEALTH (PCH)**

- A. Strong Leadership**
- B. Organizational and Management Skills**
- C. Solid Foundation of Knowledge – PCH CORE COMPETENCIES**
  - (1)** Cellular and molecular biology, genetic variation, and inheritance
  - (2)** Interactions among genes, environmental factors, and behavioral factors that contribute to health and disease
  - (3)** Epidemiological and statistical methods used to study genetic risk factors, diseases, and protective factors

- (4) Genetic/Genomic core functions and health care services
- (5) Factors, strategies, and programs that contribute to health promotion and disease prevention
- (6) Defining, assessing, and understanding the health status of individuals, families, and communities/populations
- (7) Primary, secondary, and tertiary prevention
- (8) Systems development/program planning, implementation, and evaluation
- (9) Financial planning and systems management team building, scheduling, and conflict resolution), and evaluating personnel
- (10) Cultural awareness, competence, and sensitivity regarding diversity in individuals and communities
- (11) Privacy, confidentiality, discrimination, bias, stigmatization, autonomy, beneficence, nonmaleficence, and equity
- (12) The structure and function of local, state, and national public and private health agencies and organizations
- (13) Issues and/or problems regarding access to accessible, available, high-quality, culturally competent, community-based, family-oriented, affordable, effective, and efficient services and education
- (14) Relevant technologies including, but not limited to, genetic testing, screening, and genetic/genomic bio-banking
- (15) Mobilizing community partnerships involving data collectors/analyzers, policy makers, health care providers, families, the general public, and others to identify and solve patient, family, and community-related problems and issues
- (16) Support for research and training that demonstrates new insights and innovative solutions to genetic/genomic health and health care problems/issues
- (17) Efforts that ensure a public and personal health care workforce that is competent in genetics and genomics health/health care.

### **III. CHAPTER 2: SUMMARY**

#### **A. Genetics/Genomics advances present many opportunities**

- (1) Understanding health and well-being

(2) Lowering morbidity and mortality

(3) Preventing diseases and disability

**B. Nurses roles**

(1) Creating new genetics/genomics knowledge

(2) Continuing education and training

**C.** Integrating genetics/genomics information into all aspects of the health care system

## Activities

### Classroom

Lead a classroom discussion using the following questions:

- What is a genetic nurse?
- What type of specialty unit or clinic could a genetic nurse practice (e.g., prenatal and reproduction, adult and pediatric cancer, neurology, primary care)?
- Is there a credential for a genetic nurse?
- What does GCN or APNG mean?
- How can baccalaureate-prepared, licensed nurses take a genetic credential exam?
- Are there prerequisites to take the exam?

### Small Group

Divide class into small groups and assign a Major Category under the Essential Genetic and Genomic Competencies for all registered nurses for discussion. Have each group write a case study involving one the competencies in their assigned category:

- Professional Responsibility
- Nursing Assessment
- Emerging Evidence
- Referral Activities
- Provision of Education, Care and Support

### Individual

Direct each student to read the position statement found on the International Society of Nurses in Genetics (ISONG) website→Professional Practice→Position Statements→Access to Genomic Healthcare: The role of the nurse.

[http://www.isong.org/ISONG\\_PS\\_access\\_genomic\\_healthcare.php](http://www.isong.org/ISONG_PS_access_genomic_healthcare.php)

Have each student post on the university's course discussion board or write a one-page submission paper on the impact of this statement on their nursing role in a chosen specialty area.