Genetics and Genomics in Oncology Nursing

What Does Every Nurse Need to Know?

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KEYWORDS

• Genetics and genomics • Clinical practice • Nurses • Hereditary cancer syndromes • Cancer risk assessment • Cancer genetics

KEY POINTS

- Research shows nurses, including oncology nurses, need more education about genetic information that includes how to assess risk in an inherited cancer family history.
- Red flags for other genetic disorders, not just inherited cancers, need to be identified because they can be intensified with cancer treatments.
- Enhancing the skill of taking a 3-generation family history and creating a pedigree more easily identify a family pattern of cancers that can be transmitted to the next generation.
- Oncology nurses should update their knowledge of the central dogma of molecular biology (DNA to RNA to protein) to include the smaller RNA molecules and epigenetics.
- Oncology nurses are essential to the fight against many diseases of cancer. Embracing the knowledge of genetics/genomics enables providers at all levels to provide individualized quality care to patients and families with a cancer diagnosis.

INTRODUCTION

The need for the application of genetics in nursing education and practice was noted decades before the 2003 announcement of the sequencing and mapping of the entire human genome.[1] As early as 1962, Brantl and Esslinger[2] wrote about the implications for including genetics in nursing curricula. In 1984, Felissa Cohen[3] authored a book about genetics for nurses. This created a paradigm shift and offered traditional information about genetics in an easier to understand language that could be applied to nurses' clinical practice.

Conflict of Interest: None.

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Nurs Clin N Am 52 (2017) 1–25
http://dx.doi.org/10.1016/j.cnur.2016.11.001
nursing.theclinics.com

Background

Since 2003, there has been the development of publications describing core genetic and genomics competencies required of registered nurses.[4–7] Nursing faculty and new graduates of baccalaureate programs learned that *genetics* refers to the study of genes and their roles in inheritance. Genomics describes the complex study of all genes belonging to an individual, including how genes connect with other genes and interact with a person's environment (American Association of Colleges of Nursing [AACN], National Coalition for Health Professional Education in Genetics [NCHPEG], American Nurses Association [ANA], International Society of Nurses in Genetics [ISONG], and National Council of State Boards in Nursing). The support of and interest in these publications led to a movement for inclusion of more genetics and genomics undergraduate and graduate levels education and identified an overall lack of knowledge for registered nurses, including faculty in academia and those nurses practicing in the oncology specialty.

As a specialty, oncology nurses led the translation of genetics and genomics into clinical nursing practice. Several publications written by oncology nurses identify and describe core competencies for oncology nurses, including the *Statement on the Scope and Standards of Oncology Nursing Practice*,[8,9] with Jenkins'[10,11] publication using case studies to describe how oncology nurses can apply genetic/genomic competencies. These documents were important building materials for the practice model of genetics and genomics in oncology nursing depicted in **Fig. 1**.

In the practice model, the multiple levels of oncology nursing practice incorporating genetics and genomics are depicted as a structure built on deep and shallow foundations. The deep and solid structural foundation represents The ANA Nursing: Scope and Standards of Practice, the basis of nursing practice.[12] Like the structural foundation of a building, Nursing is built in the "strong soil" of research based evidence for effective clinical interventions.

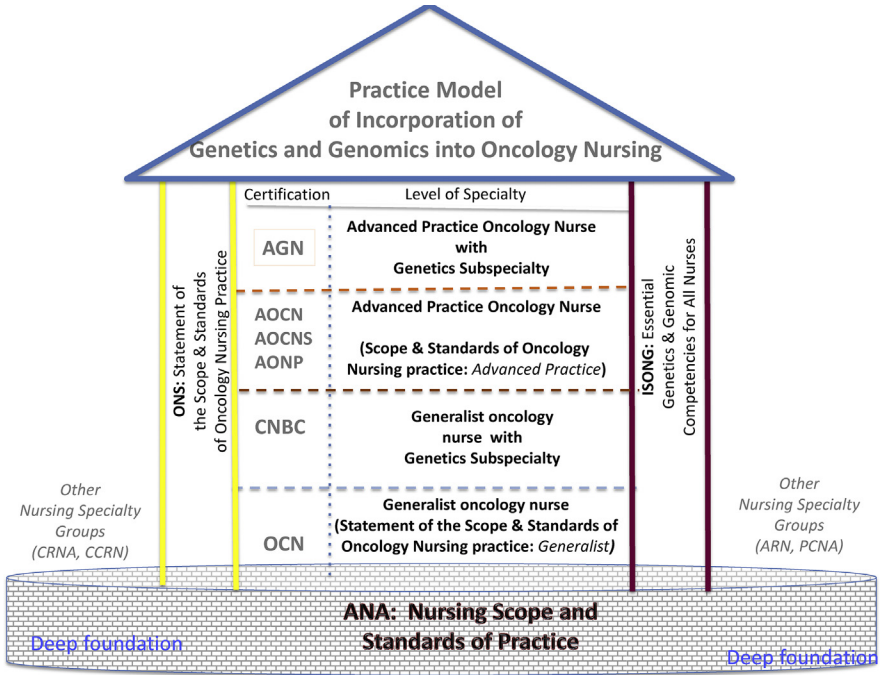

Fig. 1. Practice Model of Incorporation of Genetics and Genomics into Oncology Nursing.