



Resources to Increase Genetics and Genomics Capacity of Oncology Nurses

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Since the completion of the Human Genome Project (HGP) in 2003, the understanding of genetics and its influence on disease, particularly cancer, has increased dramatically. The initial focus after the completion of HGP was on identifying single-gene disorders, such as many hereditary cancer syndromes (e.g., *BRCA1*, *BRCA2*, HNPCC). As research continues, the major impact that genetics and genomics have across the healthcare continuum is only beginning to become clear (Pestka, Burbank, & Junglen, 2010; Thompson & Brooks, 2011). More specifically, genetics and genomics play a role in disease risk and prevention, carcinogenesis, diagnosis, prognosis, treatment selection, use of targeted agents, pain management, and end-of-life care. The implications of pharmacogenomics and cytochrome P450 (CYP) enzymes have yet to be fully understood. Oncology is one of the clinical specialties that has integrated genetics and genomics into clinical care. Therefore, oncology nurses must also include genetics and genomics into their nursing practice to provide competent, evidence-based care and to potentially improve patient outcomes (Jenkins, 2011).

Need for Knowledge

To provide competent, evidence-based care, oncology nurses need to have a baseline understanding of genetics. Competent care includes taking a family health history, constructing a pedigree, identifying red flags for those at increased risk, providing appropriate patient education and counseling, referring patients to a genetics professional when appropriate, supporting patients through the informed decision-making and consent processes, and advocating for competent genetics services for patients. However, current research has identified a continued lack of compe-

tence regarding genetics and genomics care among nurses at all levels of care (Calzone & Jenkins, 2011; Edwards, Maradiegue, Seibert, Macri, & Sitzler, 2006; Prows, Calzone, & Jenkins, 2006; Thompson & Brooks, 2011).

Policy initiatives have occurred to direct the genetics and genomics education of nurses. Nursing competencies pertaining to genetics and genomics were first published in 2006, providing the essential competencies required of all nurses; outcome indicators were added in 2008 (Consensus Panel on Genetic/Genomic Nursing Competencies, 2009). The American Association of Colleges of Nursing's [AACN's] *Essentials of Baccalaureate Education for Professional Nursing Practice* has also made genetics and genomics a requirement of baccalaureate nursing education.

Available Resources

Many resources are available to educate oncology nurses about genetics and genomics and their integration into practice, as well as to assist nursing faculty in the incorporation of genetics and genomics content into curricula (Tonkin, Calzone, Jenkins, Lea, & Prows, 2011) (see Table 1). Only a few of the numerous existing genetics and genomics resources are mentioned in this article, and they include the following web-based resources.

Genetics Education Program for Nurses: Developed by the Cincinnati Children's Hospital Medical Center, the Genetics Education Program for Nurses is a resource that provides continuing education for nurses, as well as faculty support for curriculum development. This resource offers independent, self-paced modules and web-based courses.

Genetics/Genomics Competency Center: Funded by the National Institutes of Health's National Human Genome Research Institute (NHGRI), the

Genetics/Genomics Competency Center is, in essence, a warehouse of educational materials that can be used for nurse education or self-directed learning. Resources specific to nursing practice can be identified, but transdisciplinary resources are also available. Resources are available by topic; among the available topics are basic genetics concepts, cancer genetics, risk assessment, and pharmacogenetics and pharmacogenomics.

Global Genetics and Genomics Community: The Global Genetics and Genomics Community provides web-based genomic healthcare simulations. The user has the opportunity to interview patients through the use of prerecorded interviews, interpret family histories, identify risks, and apply guidelines to patient care. This resource provides an opportunity for the user to assess his or her genomics competency, as well as to access supplemental educational materials and activities for continued learning. Case studies include patients with many diagnoses, including cystic fibrosis, post-traumatic stress disorder, and pharmacogenomics issues. Many case studies are specific to oncology and include patients and families with known mutations in the *BRCA2*, *EGFR*, and *MLH1* genes; a patient with multiple colon polyps; and a patient with a family history of breast cancer.

International Society of Nurses in Genetics: The International Society of Nurses in Genetics (ISONG) provides webinars on topics geared toward practicing nurses and nursing faculty. ISONG, in collaboration with the American Nurses Association, has published the scope and standards of practice for genetics and genomics nursing (ISONG, 2007).

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