
NURSING IMPLICATIONS OF PERSONALIZED AND PRECISION MEDICINE

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OBJECTIVES: *Identify and discuss the nursing implications of personalized and precision oncology care.*

DATA SOURCES: *PubMed, CINAHL.*

CONCLUSION: *The implications in personalized and precision cancer nursing care include interpretation and clinical use of novel and personalized information including genetic testing; patient advocacy and support throughout testing, anticipation of results and treatment; ongoing chronic monitoring; and support for patient decision-making. Attention must also be given to the family and ethical implications of a personalized approach to care.*

IMPLICATIONS FOR NURSING PRACTICE: *Nurses face increasing challenges and opportunities in communication, support, and advocacy for patients given the availability of advanced testing, care and treatment in personalized and precision medicine. Nursing education and continuing education, clinical decision support, and health systems changes will be necessary to provide personalized multidisciplinary care to patients, in which nurses play a key role.*

KEY WORDS: *Personalized medicine, nursing, genomics, oncology*

ONCOLOGY care has shifted toward personalized and targeted approaches with the scientific and technologic advances of the past decade.¹⁻⁷ Many personalized and precision advances are focused on 'omics'-based platforms to calculate risks,

contribute to diagnosis, classify tumor types, identify likely response to treatments, and predict recurrence, metastasis, remission, morbidity, and mortality.⁷⁻⁹ Precision treatment based on individual tumor genetic markers is currently a reality in cancer care and the landscape of clinical

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practice continues to evolve with new scientific advances. The implementation of personalized and precision medicine requires major health systems changes, including the incorporation of information technology to handle the data and introduce support tools for clinical use of the information.¹⁰ However, it also brings important implications for nursing to the forefront as nurses must have adequate preparation and knowledge of the ongoing evidence to care for patients using personalized strategies. As patient advocates, educators, and providers of direct care, nurses will be on the front lines of implementation of state of the science care.

A major driver for the need to discuss implications related to personalized and precision medicine are the rapid advancements in genome science and technology, particularly over the last decade, and ongoing discoveries.^{6-9,11-13} Layered on to those advancements are health care systems and policy initiatives such as the 'patient centered medical home' (ie, comprehensive coordination of patient-centered care)¹⁴ and patient-centered care that have also influenced aspects of the implementation of personalized approaches to health care. Specific to oncology, there is an ever-increasing complexity to and utilization of genetic (somatic and germline) testing in clinical care. Nurses in oncology have witnessed increased utility of genomic analysis for individualized tumor analysis and the evolution of targeted drugs for blocking more specific biochemical pathways.^{5-7,11,12,15} Congruent with this, the fields of pharmacogenetics and pharmacogenomics target individualized drug metabolism and gene therapy for exacting patient responses.¹⁶ These aspects of scientific research have really allowed for 'precision' care to be implemented. However, these advancements are also changing the scope of nursing care and practice as nurses address patient implications of personalized and precision medicine.¹⁷

Given the amount and types of data that will be collected in electronic health records with personalized medicine strategies, there is also a great need for evidence-based means of synthesizing biomarker, clinical and patient-reported data, and a standardized means of utilizing and communicating the information to providers and patients. For example, in oncology, family history or genetic testing algorithms may trigger results with treatment or screening recommendations to providers and patients. Or, results of pathology and tumor genetic

markers may direct providers and patients to appropriate or targeted treatment or even clinical trials based on this information. Patients need education and information as to what this type of testing entails; the results they should anticipate receiving; and how it may potentially help them and their providers decide on treatment steps. With the increasing amounts and types of 'omics' profiles and additional clinical data, nurses will also be looking at ways to optimize the use of personal patient data of multiple types in patient care.¹⁸

Nurses need to be at the forefront of patient care with a multidisciplinary team to truly deliver personalized and precision care. In terms of risk testing for patients and their families, advances aimed at personalized and precision care provide patients with earlier and increased information about cancer risk. Nurses need to be prepared to assist patients in interpreting the results of clinical genetic testing, as well as commercially available consumer-based testing, and/or referring to genetic specialists as needed. It is likely that these activities will be in concert with a genetic counselor; however, nurses are anticipated to fill the increasing gap in services related to genetic counseling that are consistent with the scope of nursing practice.^{17,19} Nurses need to assess other clinical risk factors; discuss and clarify patient values and priorities; provide information to enhance decision making around screenings or risk-reducing treatments; and provide support for family notification and testing as indicated.²⁰ When nurses anticipate these needs and coordinate efforts with other members of the health care team, the likelihood of patients benefiting from personalized and precision care increases.

PATIENT ASSESSMENT AND MANAGEMENT

The first step in providing personalized care is to assess the patient's current understanding of their risk or disease status, as well as their personal health concerns or priorities. As demonstrated in one study regarding patient attitudes about personalized medicine in cancer care, most patients were not aware of or able to define 'personalized medicine.'²¹ However, many identified the relevant benefits of approaches such as somatic testing and were willing to undergo targeted somatic and germline testing. Nurses play a key role in personalized medicine as they interact with and provide information and anticipatory guidance to patients before undergoing genetic or

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