Precision Medicine

Accelerating the science to revolutionize cancer care

Jeannine M. Brant, PhD, APRN, AOCN®, FAAN, and Deborah K. Mayer, PhD, ANP-BC, AOCN®, FAAN

BACKGROUND: Precision medicine in cancer care uses specific information about a person’s tumor to help diagnose, plan treatment, prognosticate, and surveil throughout the cancer trajectory. Applications exist for cancer prevention, early detection, cancer treatment, and supportive care. Several national initiatives (e.g., National Cancer Moonshot Initiative) support these efforts to accelerate this science forward.

OBJECTIVES: This article presents an overview of the way in which precision medicine is revolutionizing cancer care.

METHODS: Definitions, historic perspectives, and specific examples are provided, which illustrate the use of precision medicine in cancer care.

FINDINGS: Oncology nurses and other healthcare professionals have a responsibility to learn about the science and national initiatives supporting precision medicine, provide clear patient education messages for optimal understanding, and address challenges.

KEYWORDS
precision medicine; cancer care; National Cancer Moonshot Initiative; oncology nurses

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Evolution of Precision Medicine

Traditionally, cancers were treated by site of origin, tumor histology, and extent of disease. As knowledge about the makeup of cancers and their growth mechanisms has been refined, this approach has changed. One early example is the ability to measure estrogen receptors on breast cancer cells and use those results to predict response to endocrine therapy. This became standard clinical practice in the 1970s and is still an important indicator, but the methods for testing have changed with time (McGuire, 1973). Another example is the ability to measure the expression of the human epidermal growth factor receptor 2 of the ERBB2 gene in breast cancer. Overexpression of