Precision Medicine an Interprofessional Science

Pamela Z. Cacchione, PhD, CRNP, BC, FGSA, FAAN[1]

Precision medicine is the science community's movement to address differences in individual treatment responses. Precision medicine has been defined as the development of prevention and treatment strategies that take into account individual variability (Collins & Varmus, 2015). Precision medicine entails using large-scale biological databases, powerful methods of categorizing individual data, including, but not limited to, proteomics, metabolomics, genomics, and diverse cellular assays and mobile health technology. In addition, computational tools will be required for analyzing these large data sets (Collins & Varmus, 2015). No one discipline can support all these required scientific methods. This movement is designed to ultimately use precision medicine to build the evidence-base needed to guide clinical practice and will require significant resources from the nursing, medicine, and the biological sciences (Collins & Varmus, 2015).

President Obama has committed more than 215 billion dollars to a Precision Medicine Initiative. He describes this initiative as a new model of patient-powered research that promises to accelerate biomedical discoveries and provide clinicians with new tools, knowledge, and therapies to select which treatments work best for a given individual (White House, 2015). There are two components to this initiative. The first component is a near-term focus specifically on cancer, and the second component, a more long-term goal, is to focus on generating knowledge that is applicable to the whole range of health and disease (Collins & Varmus, 2015). The potential benefits of the Precision Medicine Initiative include the development of the following:

[1]University of Pennsylvania, Philadelphia, USA

Corresponding Author:
Pamela Z. Cacchione, University of Pennsylvania School of Nursing, 418 Curie Blvd, Philadelphia, PA 19104-4217, USA.
Email: pamelaca@nursing.upenn.edu

- New approaches for protecting research participants, particularly patient privacy and confidentiality of their data
- New tools for building, analyzing, and sharing large sets of data
- Improved FDA oversight of tests, drugs, and other technologies to support innovation while ensuring these products are safe and effective.
- New partnerships of scientists in a wide range of specialties, as well as people from the patient advocacy community, universities, pharmaceutical companies, and others.
- Opportunities for a million people to contribute to the advancement of scientific research. (Department of Health & Human Services, 2016, p. 7)

Nursing science fits well with this initiative. Nursing has always focused on human responses to health and illness, which is well within the realm of precision medicine. The National Institute of Nursing Research (NINR) is supporting this Precision Medicine Initiative with a focus on symptom science (NINR, 2015). NINR supports interprofessional research that integrates the biological and behavioral sciences with patient outcomes rather than specific disease outcomes (NINR, n.d.). NINR through an emphasis on symptom science supports nursing scientists with interprofessional teams who are contributing research findings that can predict individual's most at-risk for adverse symptoms and conditions, monitor treatment efficacy, and guide interventions to improve health and symptom outcomes (NINR, 2015).

Nurse experts in ethics, informatics, bench research, big data, and clinical research all fit within the opportunities and challenges of this new Precision Medicine Initiative. The synergy created by interprofessional research teams is well engrained in nursing research and NINR. Nursing research has a large role to play in the Precision Medicine Initiative. For example, NINR's intramural research program developed the National Institute of Health (NIH) symptom science model.

The NIH NINR intramural research program developed the National Institutes of Health Symptom Science Model to guide research (Cashion & Grady, 2015). Nurse researchers can use this model to guide biobehavioral research to address complex symptoms and develop targeted interventions. This model is also used as a training framework and career development to enhance patient outcomes including health related quality of life (Cashion & Grady, 2015). This model guides scientists through the process of identifying symptoms clusters, standardizing how syndromes are measured across groups or conditions, and identifying biomarkers associated with symptoms and symptoms experiences and finally developing treatments and interventions that prevent or reduce symptoms (NINR, 2015). This aligns very well with

precision medicine and should be integrated into nursing research proposals as appropriate.

Nursing science can greatly benefit by this latest Precision Medicine Initiative by identifying their strengths and partnering with interprofessional colleagues to build a research team that can take full advantage of the emerging human data sets available that will include extensive characterization of biological specimens, behavioral data all linked to their electronic health records (Collins & Varmus, 2015).

For more information about the Precision Medicine Initiative, please see The NIH white paper titled "The Precision Medicine Initiative Cohort Program—Building a Research Foundation for the 21st Century Medicine." It can be accessed at https://www.nih.gov/precision-medicine-initiative-cohort-program. For more information about Precision Medicine in cancer research, please visit the National Cancer Institute's web site, http://www.cancer.gov/research/key-initiatives/precision-medicine.

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