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What Will I Bring: Nurse Scientists' Contributions to Interdisciplinary Collaboration

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“What will I bring?” The question arose during a seminar involving PhD students and the editor (RP) who was the course faculty. Our guest, a National Institutes of Health (NIH) funded nurse scientist doing exciting biobehavioral work on prematurity prevention in women of diverse racial backgrounds had just “reminded” students that they would not need to “know everything” to conduct research. Rather, she emphasized in her remarks that students should build their research teams with experts where needed including scientists with a background in immunology, genetics, statistics, and other fields as appropriate. Good advice, often repeated. And then, a student raised her hand and when called on, she said, “We are often told to build an interdisciplinary team. But with all those experts, what will I bring to that team?”

There was a moment of stunned quiet. Our guest fell silent. The student and her classmates, who nodded in agreement, looked expectantly in the direction of the course faculty. Fortunately, there was an answer to the question, provided eloquently by the guest faculty. Before our guest had mentioned the interdisciplinary contributions of her team members and their collaborative work, she had told the story of how she had started as a staff nurse in obstetric nursing. She had talked about her clinical experiences and about the people (aka as patients) she had met when she started her career and how their stories, their concerns, their hopes, their needs, inspired her to help them. She discovered she needed to learn more in order to help. She returned to school to learn more about how to provide clinical care and was encouraged to pursue a PhD in order to be able to systematically solve the clinical problems she was observing. She had explained that even with this advanced educational preparation, she always knew she would need greater expertise about biological and behavioral aspects of her research questions than she possessed or even wished to obtain. Thus, she started building a team, which continues to work together after many years.

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And there was the answer. What our guest, the student asking the question, her classmates in the seminar, and each of us who are nurse scientists bring to that exquisite research team, is our nursing perspective. It is our perspectives on the human condition, health and illness, prevention and healing, and understanding and care that help us see the person holistically (McBride, 2010). That holistic perspective is concerned with the hopes and needs of those for whom we provide care. What we bring to the team is that perspective on person who, at the end of the day, we hope to help in our research. The immunologist may be best able to help us understand the interactions among various biological markers. However, the reason we seek understanding of those interactions is the one *we* articulate; we want to understand so we can help save a life or make a life better. We bring this nursing perspective, this holistic view, to every team of which we are a member. That perspective is critical to research on human health and it is the most important reason nurse scientists are so desperately needed on interdisciplinary research teams.

Interdisciplinary Collaboration in Action

A week following this classroom exchange, the open session of the National Advisory Council for Nursing Research (NACNR) at the National Institute of Nursing Research (NINR) included presentations by NINR intramural scientists, led by the Scientific Director of the NINR (AC). Notable in the excellent presentations was the message that, among the many talents and skills the nurse scientists were taking to the interdisciplinary research table, chief among them was the patient perspective and the ability to interpret research findings through a clinical lens.

The NINR intramural program, located in Bethesda MD on the National Institutes of Health (NIH) campus, is comprised of nurse scientists whose research is organized around symptom science and housed in an environment that provides training for the next generation of nurse scientists (<https://www.ninr.nih.gov/researchandfunding/dir>). Specifically, the NINR intramural program is dedicated to conducting research on the molecular and biobehavioral mechanisms underlying symptoms. The NIH-Symptom Science Model provides a framework for integrating basic science, clinical research, and biobehavioral knowledge into the development of interventions and it is foundational to NINR intramural science. Work in symptom science begins with the presentation of a symptom or cluster of symptoms. The symptom undergoes phenotypic characterization followed by biologic or omic research that ultimately leads to clinical applications resulting in symptom reduction and improvement (Cashion & Grady, 2015).

In the NINR intramural program, nurse scientists lead interdisciplinary teams composed of a wide range of scientists from other disciplines such as bioinformatics, biomedical engineers, neuropsychologists, dietitians, and physicians to further understand symptoms and to develop interventions for their management. For example, Dr. Leorey Saligan has led his research team to specify the clinically-relevant phenotypic characterization of cancer related fatigue (CRF). The team then uses this knowledge to guide the identification of CRF-related biomarkers providing a foundation for testing applications in clinical trials. Ultimately, the team's work will be translated into clinical interventions that alleviate the

complex and debilitating symptoms of CRF experienced by many current and former patients with cancer.

Another example of how nurse scientists at NINR contribute to the interdisciplinary team comes from the work of Dr. Wendy Henderson, who focuses on symptoms associated with digestive disorders to improve diagnosis and treatment. Recently, Dr. Henderson and her team co-invented a new patent-pending methodology to test stool rapidly at the point-of-care for infectious pathogens. This first-of-a-kind test is done without a laboratory, allowing clinicians to treat patients immediately since the test results are provided within minutes as opposed to days. In addition to providing fast results, the paper-based test has the potential to improve outcomes, especially in resource-limited settings in the developing world where 500,000 children a year die from diarrheal diseases. Clinical validation of the tool is now occurring in her lab.

A final example of the interdisciplinary, nurse-scientist led work at NINR comes from Dr. Jessica Gill, who leads a global network of research collaborators in studies focused on complex symptoms of neurological trauma in cohorts of athletes, civilians, and military personnel. Recent findings from Dr. Gill and her colleagues include the identification of elevations of tau within six hours of a concussion as a predictor of return-to-play in athletes. In another study, Dr. Gill's team found gene-activity in immune cells during the sub-acute period following concussion in athletes related to recovery, including balance and cognition. These symptoms and deficits were also linked to reductions in sleep quality, providing fundamental insights into the role of sleep and inflammation in recovery from traumatic brain injury and concussion.

Together, the interdisciplinary, nurse-scientist led programs of research at NINR provide evidence of the significant contributions to basic and clinical research around symptoms such as fatigue, gastric dysfunction, and sleep disorders that affect millions of individuals on a daily basis. Moreover, the examples of these scientists provide a model for nursing's youngest nurse scientists to follow. Chief among the lessons exemplified by the NINR intramural scientists are the need to have and the power of confidence in scientific knowledge and skill in leading interdisciplinary teams. PhD prepared nurses have this knowledge and skill. It is taught in our PhD programs and it is role-modeled daily by the many nurse faculty across the country who have committed their significant talents to preparing future generations of scientists who will carry on our disciplinary traditions while at the same time encouraging the expansion of interdisciplinary research. It is evident as well in the many PhD prepared nurse scientists whose work takes place in clinical settings across the globe.

To our readers who are just starting their research careers, we ask you to remember that whether you are conducting a clinical study within a hospital setting, using an animal model in a laboratory, exploring health experiences in the community, examining predictors of health and illness using a large dataset, or testing a new intervention in a multi-site trial, the most important thing you bring to the table is your focus on providing a clear and distinct link to improving patient outcomes. Yes, you will know much about science, about research methods, and about disease and wellness. But it is the focus on improving patient outcomes

and that critical patient perspective that is so greatly needed in health care research. And that, is what you, and we, bring to the table.

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