

## Fostering Interdisciplinary Research

Margaret M. Heitkemper, RN, PhD, FAAN<sup>1)2)</sup>

Interdisciplinary collaboration on research is identified as a key component of the United States National Institutes of Health (NIH) research agenda. This is evident in the growing number of research initiatives, opportunities, and program announcements which emphasize the importance of cross discipline collaboration. There is an inherent advantage to interdisciplinary research. As Dr. Jeanne Benoliel pointed out in her keynote address to the Western Interstate Commission on Higher Education in Nursing in 1975 ‘In essence the development of scientific knowledge in any field evolves by means of competition and collaboration in the realm of ideas and in the practice of research.’ (Benoliel, 1973)

In the 3 decades since Dr. Benoliel’s remarks, nursing scientists have demonstrated increasing competence in both competing and collaborating with colleagues across a variety of disciplines as evidenced by leadership roles in recent federal grant funding initiatives and dissemination in interdisciplinary journals and venues. As the generation of scientific knowledge produced by nursing scientists has increased so has the need to further intensify our engagement and leadership in research that cuts across disciplines. The growing focus on the need for interdisciplinary research has made it imperative that nursing scientists collaborate with colleagues in other health-related fields including medicine, dentistry, public health, physical and occupational therapy, and social work. This article addresses the work of the Center for Women’s Health and Gender Research (CWHGR) in facilitating interdisciplinary research by nursing scientists at the University of Washington.

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1) Professor, Chairperson and Elizabeth [Sterling Soule](#) Endowed Chair  
School of Nursing, BNHS, University of Washington  
1959 Pacific Street NE, T-601, Box 357266  
Seattle, WA 98195  
Bus Phone: 206-543-1091;  
Home Phone: 206-525-0643  
Fax: 206-543-4771 [heit@u.washington.edu](mailto:heit@u.washington.edu)

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### Review

In 1989 the Center for Women’s Health Research (forerunner to the Center for Women’s Health and Gender Research) was established

within the University of Washington School of Nursing (UW-SON) through funding from the National Institutes of Nursing Research, National Institutes of Health. Dr. Nancy Woods, a well known expert in women's health, was the lead investigator for the center. An ecological, biopsychosocial framework, as proposed by Dr. Joan Shaver in the early 1980s (Shaver, 1985), was used as the theoretical foundation for the Center. The specific focus on women's health evolved from shared interests among faculty both in the UW-SON and other university schools and departments. The early years of the Center are detailed in a paper by Woods and Shaver. (1992)

In the first 5 years of the Center, investigators developed a data base that included women transitioning to and through the menopause as well as a series of studies related to stress reactivity in midlife women. At that time, most of the Center's activities focused on building the infrastructure to support collaborative research within the UW-SON. This was accomplished in part by the small grant awards as well as the provision of core support services. The latter included the creation of the Biobehavioral Laboratory Core and the Sociocultural Core.

In 2004, the Center renamed itself as the Center for Women's Health and Gender Research (CWHGR). This occurred as a result of the growing need to examine women's health within the broader context of sex and gender differences. For example, Center investigators began to study sex- and gender-related differences in biological functions and health risks. With a broadening of the focus to include issues related to men's health, opportunities for interdisciplinary collaboration were enhanced.

Currently, the mission of the CWGHR is to support research efforts related to promoting health and understanding health care problems with a special emphases on: 1) interface of biological, behavioral and experiential responses within the context of sex- and gender-based differences, 2) the role of reproductive and stress-related hormones and autonomic nervous system balance on diverse physiological functions and symptom experiences, 3) individual (e.g., age, developmental stage) and sociocultural factors (e.g., ethnicity, income adequacy, rural or urban environments) that interact with gender and that result in health disparities; 4) the development of gender-tailored and sensitive therapeutic interventions to promote health, enhance function and reduce symptom distress; and 5) enhance community partnerships to the point of engaging communities in generating a research agenda relevant to their needs and partnering in the research process from identification of the topic through the analysis and dissemination of the research findings within the community. In addition, CWHGR investigators collaborate with nursing scientists across academic institutions via the development of collaborative relationships between the UW-SON and research-developing institutions (West Virginia University, Washington State University, University of Hawaii-Manoa, University of Alaska-Anchorage). These collaborations are being accomplished through small grant funding, intensive research institutes, and mentorship activities at the individual and organizational levels. Interdisciplinary research is stressed throughout these activities. (Heitkemper, et al., In press)

□ Strategies to Enhance Interdisciplinary Collaboration

To meet the evolving and challenging goals of the CWHGR it is imperative that nursing scientists solidify their interdisciplinary collaborations. One important strategy to accomplish this is the continuation of CWHGR core research support services. Over the almost 20 years of the CWHGR, the Biobehavioral Laboratory Core has grown to include biological measures of immune function (e.g., cytokines, natural killer cell activity), stress hormones (e.g., cortisol, catecholamines), mood state (e.g., serotonin), sleep (e.g., polysomnography, actigraphy), and reproductive hormones (e.g., estrogen, progesterone, testosterone). Most recently, the CWHGR Laboratory Core developed techniques to collect and examine genetic markers (e.g., serotonin reuptake transporter protein alleles). The selection of measures for development is based on requests from individual faculty as well as research teams. For example, investigators who wish to examine biological markers are counseled on potential options based on current state of the science and availability of services both within the UW-SON as well as the Schools of Medicine and Public Health. Laboratory services are provided on a fee basis to interdisciplinary colleagues in other parts of the university.

The creation of core services within the center provides opportunities for faculty from other disciplines to initiate and sustain research collaborations with SON faculty. In particular, the need to examine disease risk and therapeutic outcomes within a biobehavioral and sociocultural framework using state of the art biomarkers and data analytic strategies made the services of center attractive to scientists beyond the SON. The CWHGR has facilitated the identification of common areas of research interest and the inclusion of additional investigators who have incorporated center services into their study

applications and programs. This has created the opportunity for greater dialogue and ultimately collaboration on projects focused on conditions such as perimenopause symptomatology, irritable bowel syndrome, post stroke depression, fibromyalgia, and insomnia. These collaborations over time resulted in additional federal grant support.

The Sociocultural Core (now named the Gender Disparities Core) was developed to acknowledge the importance of context on women's lives and health. An example is the research related to premenstrual distress. To fully examine this common distressing condition, investigators examine symptoms in the context of fluctuating hormone levels and mood states as well as family relations and social support. Investigators who wish to examine biological markers are counseled on potential options based on current state of the science and availability of services both within the UW-SON as well as the Schools of Medicine and Public Health.

The strong emphasis of the CWHGR on interdisciplinary research is derived from several compelling needs and opportunities. Based on the original model of women's health, i.e., that women's health cannot be separated from women's lives, continued collaboration with experts representing a range of disciplines is needed. First, there is a need for interdisciplinary teams of scientists to examine sex- and gender-related differences in health risk, response to therapeutic interventions, behavioral management, and disease outcomes as a means to better understanding of conditions that account for health disparities across the lifespan. Second, nursing scientists are both needed and well-positioned to move science from the bench (sex-based differences) to health

promotion and disease management (translational research). Third, the work of center investigators makes this a natural paradigm shift as more center investigators begin to utilize designs and measures that required additional expertise. Fourth, partnering with various UW centers focused on genetics allows center investigators to incorporate genetic markers into studies of health risk. Fifth, developing interdisciplinary education and faculty development programs reduces barriers to additional collaborations(Heitkemper, [In press](#)).

Seeking out interdisciplinary research collaboration opportunities often rests with the investigator's willingness to be open and to share. To succeed at interdisciplinary collaboration one must consider the importance of the research question to be addressed, respect the unique perspective of each participant, and engage in open communication throughout the process. (Heitkemper, [In press](#)).

The Executive Committee of the Center includes faculty members with diverse educational and research experiences. While all members are nurses, their combined doctoral education includes the fields of nursing, physiology, anthropology, and psychology. Many of the Center investigators have adjunct appointments in other schools including medicine, anthropology, women studies, and epidemiology. As a direct result of these appointments, they present research findings at intradepartmental seminars, e.g., medical rounds, and participate in small research groups. In these roles they also engage in mentorship of non-nursing predoctoral fellows, medical students, and medical fellows.

The CWHGR also provides initial small funding for pilot projects. A number of studies

supported at least in part by pilot funding have evolved into larger interdisciplinary studies focused on a variety of topics including sleep problems in women within certain specific age or patient groups, cognitive behavioral therapies for irritable bowel syndrome, and longitudinal study of women across the menopause transition.

In addition to providing pilot data for a larger study, the small grants also allowed interdisciplinary investigators to have a trial period in which to build trust and assess each others strengths and weaknesses as well as willingness to share additional resources. Issues such as roles, authorship and possible leadership on follow-up applications are addressed early in the pilot project development. This was particularly important during the development of immune and genetic markers.

Nursing scientists affiliated with the CWHGR collaborate in interdisciplinary work beyond the UW. For example, investigators participate as members of interdisciplinary scientific advisory groups or boards in industry and the federal government. Examples include the National Academy of Sciences, Institute of Medicine, and the National Institutes of Health. Such positions provide opportunities to influence the agendas of interdisciplinary groups as well as to inform health policy decisions.

#### □ Barriers to Interdisciplinary Research

Unfortunately too many times there are often barriers to interdisciplinary research. Barriers can include both institutional characteristics as well as individual investigator characteristics that are not conducive to collaboration across disciplines. Individual investigator issues that can interfere

with collaborative efforts include inadequate communication and lack of trust.

The allocation of ‘indirect’ or institutional cost returns to the school or department in which the grant proposal originated can be problematic for some institutions. Universities that allow for equitable distribution of research recovery costs based on intellectual input and effort are more conducive to interdisciplinary research. New initiatives from the National Institutes of Health now allow for multiple principal investigators and thus, the sharing of the institutional allowances.

Another potential barrier to interdisciplinary collaboration is the institution’s policies related to faculty appointments, tenure, and promotion. In some institutions interdisciplinary activities may not be acknowledged or rewarded. Such policy disincentives may have long reaching effects on the ability of an institution to address the national research agenda. (The National Academies Press, 2004). It is clear that interdisciplinary research is more likely to occur in those institutions where there is a strong commitment to support interdisciplinary education and research.

At the individual investigator level it is the enthusiasm (or passion) that each investigator brings to the table that is the true ingredient for success in interdisciplinary research. Considering the importance of the research question to be addressed, respecting the unique perspective of each participant, and engaging in open communication throughout the process are critical to the success of interdisciplinary research.

## Summary

The future research agenda for nursing science development must include interdisciplinary collaboration. The merging of perspectives from a variety of disciplines as health care problems are identified and studied will enhance patient, family and community outcomes. Two strategies for enhancing interdisciplinary collaboration include 1) investment in the development of research centers that provide core services and consultation, and 2) enhancement of institutional support through the establishment of incentives and rewards for interdisciplinary collaborative efforts both in education and research.

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**Abstract**

## Fostering Interdisciplinary Research

**Margaret M. Heitkemper, RN, PhD, FAAN<sup>1)</sup>**

Today interdisciplinary collaboration is an important component of clinical research. This paper focuses on how the University of Washington School of Nursing (UW-SON) Center for Women's Health and Gender Research (CWHGR) facilitated and sustained interdisciplinary research. The CWHGR funded by National Institutes of Nursing Research has been an important resource for the UW-SON since its inception in 1989. The CWHGR encourages interdisciplinary collaborative research by providing small grant funds, mentoring faculty and pre- and postdoctoral fellows, providing consultation to researchers in other disciplines, and creating a model of biobehavioral and sociocultural research collaboration that facilitates interdisciplinary research. A brief overview of the UW-SON CWHGR is provided as well as identification of barriers to interdisciplinary research.

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1) Professor, Chairperson and Elizabeth [Sterling Soule](#) Endowed Chair  
School of Nursing, BNHS, University of Washington  
Seattle, U.S.A  
Email: [heit@u.washington.edu](mailto:heit@u.washington.edu)