

Quality Advancement in Nursing Education - Avancées en formation infirmière

Volume 1 | Issue 1

Article 8

Building the Research Enterprise in the Academic Environment:

Geraldine Polly Bednash

American Association of Colleges of Nursing, rosseter@aacn.nche.edu

Jane Kirschling

University of Maryland School of Nursing, kirschling@umaryland.edu

Eileen T. Breslin

University of Texas Health Science Center San Antonio School of Nursing, breslin@uthsca.edu

Robert Rosseter

American Association of Colleges of Nursing, rossete@aaqn.nche.edu

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Recommended Citation

Bednash, Geraldine Polly; Kirschling, Jane; Breslin, Eileen T.; and Rosseter, Robert (2014) "Building the Research Enterprise in the Academic Environment:," *Quality Advancement in Nursing Education - Avancées en formation infirmière*: Vol. 1: Iss. 1, Article 8.

DOI: <https://doi.org/10.17483/2368-6669.1006>

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Building the Research Enterprise in the Academic Environment:

Cover Page Footnote

The paper presents an introduction to nursing research in the U.S. with an emphasis on the educational and operational resources needed to maintain a robust research enterprise in schools of nursing. Key supports for this important work are profiled, including federal agencies and programs committed to advancing nursing science and the more widespread engagement of nurses in team-based research. The paper concludes with a look at efforts underway to enhance quality in research-focused doctoral programs and an assessment of critical roles nursing deans and faculty play in championing nursing research and preparing the next generation of nurse scientists.

Nursing research is a critical element in the delivery of effective, high quality, and safe nursing care. The preponderance of nursing research conducted in the United States occurs in schools of nursing. Accordingly, a major role for academic leaders in nursing education is the development of a resource base to support and expand the research mission of the nursing program. The intersection of research and practice is also an essential element for assuring the relevance of nursing research and advancing the application of the evidence generated by nursing scientists.

The following paper presents an introduction to nursing research in the U.S. with an emphasis on the educational and operational resources needed to maintain a robust research enterprise in schools of nursing. Key supports for this important work are profiled, including federal agencies and programs committed to advancing nursing science and the more widespread engagement of nurses in team-based research. The paper concludes with a look at efforts underway to enhance quality in research-focused doctoral programs and an assessment of critical roles that nursing deans and faculty play in championing nursing research and preparing the next generation of nurse scientists.

Evolution of Nursing Research

Florence Nightingale is widely acknowledged as the first individual to engage in nursing research, and the first to apply the evidence developed through her research to improve the quality, safety, and efficacy of the nursing care delivered. Her initial study of morbidity and mortality for soldiers in the Crimean War was a sophisticated effort to answer questions about the impact of the patient environment (e.g., cleanliness, hydration, and ventilation) on patient outcomes. Her work to improve the hygiene and hand washing practices of nurses and others caring for patients resulted in a dramatic decrease of mortality among wounded soldiers from 43% to 2% (Sarkis & Conners, 1986). Nightingale was the first nurse known to put research-based evidence into practice and initiate both nursing and outcome-focused health services research.

Although Nightingale's research was conducted in the 1850s, nurses did not engage widely in research until almost the middle of the next century. Nightingale was an unusual figure in nursing given her social standing, economic status, and advanced education. She was instrumental in the development of a structured educational program for nurses, known as the Nightingale Training School for Nurses. Though the school's curriculum put more emphasis on the scientific knowledge needed for safe practice, nurses were not formally educated to serve as researchers until many years later. The United Kingdom was again the source of an emerging nursing research effort in the late 1940s as a result of the creation of the National Health Service (Moule & Goodman, 2008).

In the early 20th century, noted nurse leaders in the United States, such as Mary Adelaide Nutting, called for nursing education to take place in the academic setting, rather than the hospital where the preponderance of nursing education programs were housed. Even so, growth in academic institution based nursing programs did not occur until the middle of the century. With the movement into the academy, nursing research began to flourish, and in 1952, the first issue of the premiere US journal *Nursing Research* was published under the leadership of Helen

Lathrop Bunge, chair of the editorial board. The publication's stated purpose was to stimulate nursing research and inform practitioners of the results of nursing science.

Early nursing research was conducted, to a great extent, by sociologists and psychologists who focused heavily on nurses, their characteristics, what led them to a nursing career, and what their education experiences were, rather than the practice of nursing. In fact, a literature base for nursing was almost nonexistent until the mid-20th century (Sarkis & Connors, 1986). Nursing practice was not the focus of the emerging work of either nurses or other researchers. In the 1970s, the release of the Briggs report in the United Kingdom made the recommendation that nursing research should serve as the foundation for nursing practice (Moule & Goldman, 2008). This report provided a strong stimulus to generating widespread interest in the development of nursing research and had an impact well beyond the borders of the UK.

The Academic Health Science Center Environment

As nursing education moved out of the hospital and into the academic setting, nurses began to seek preparation in graduate programs in nursing. The first doctoral programs in the United States emerged in the 1950s and were primarily located in academic health science centers. Academic health centers (AHCs) are defined as institutions that house a medical school and at least one other health professional education program. Among those institutions that were early providers of nursing doctoral degrees were Columbia University, the University of California, San Francisco, the University of Pittsburgh, and the University of Alabama, Birmingham. These institutions became, and remain, strong centers for nursing research.

Despite the emergence of programs designed to offer the terminal degree in nursing, academic leaders in higher education often opposed awarding the Doctor of Philosophy (PhD) degree to nurses, given their view that nursing programs did not have the stature or scientific rigor to grant this degree. Thus emerged the Doctor of Nursing Science degree, designated as the DNS or DNSc, as nursing education's solution to offering a terminal research degree for the profession. Over time, however, the PhD replaced the Doctor of Nursing Science as the degree designation for most graduates of research-focused nursing doctoral programs in the United States. In fact, a number of institutions that offered the DNS/DNSc degree have retroactively received approval for their alumni to be awarded the PhD. Of the 128 research-focused doctoral nursing programs in the US, only six still grant the DNS/DNSc degree. In 2013, an additional six institutions were in the process of developing new research-focused doctoral programs (AACN, 2013).

In the US today, there are 93 AHCs housing nursing programs; located across 41 states plus the District of Columbia and Puerto Rico. AHCs are major sites for doctoral education, which serve as centralized hubs for nursing research and interprofessional team-based research. AHCs play a major role in providing advanced levels of nursing education. Although only 13% of all US based nursing baccalaureate and graduate programs are in AHCs, these institutions graduate 50% of the individuals receiving research-focused degrees annually. However, despite the growth in the number of doctoral programs in nursing, less than 1% of the 3 million nurses in the United States hold the terminal degree (HRSA, 2010). Moreover, currently 53% of nurses with a doctorate have a doctoral degree in a field other than nursing, such as education, psychology, anthropology, or other disciplines (HRSA, 2010). Looking toward the future, the majority of

nurses with doctoral degrees in nursing in the US will likely hold the Doctor of Nursing Practice (DNP) degree, as advanced practice registered nursing transitions to the practice doctorate (AACN, 2004).

The National Institute of Nursing Research

Given the growing expansion of nursing doctoral education in the late 1970s (Grace, 1978) and the emergence of a strong base of nursing science, nurse scientists and clinicians engaged in a policy effort to develop a national center for nursing research that would be funded by the US government and housed in the premier research center for the US, the National Institutes of Health (NIH). This work was supported by the findings of two federal studies. A 1983 report by the Institute of Medicine recommended that nursing research be included in the mainstream of biomedical and behavioral science, and a 1984 NIH Task Force study found nursing research activities to be relevant to the NIH mission (DeLaune & Ladner, 2010). Nurses in the US were not uniformly supportive of policy efforts to pass a legislative mandate to fund nursing research. Early opponents to the creation of what would become the National Institute of Nursing Research were concerned that funds would be drained away from federal support for nursing education and framed this work as a zero sum effort that would harm nursing education.

However, the strong work of multiple constituents in nursing and in the US Congress were successful in passing legislation in November 1985 that mandated the creation of the National Center for Nursing Research (NCNR) at the NIH. The NCNR began with a budget of \$5.5 million for grants to support nursing research under the leadership of Doris H. Merritt, acting Director. In 1986, the Secretary of Department of Health and Human Services appointed the inaugural members of the NCNR Advisory Council. In 1987, Ada Sue Hinshaw became the first permanent Director of NCNR and held that post until 1994. Through continued work across multiple constituencies, the NCNR was renamed the National Institute of Nursing Research (NINR) in 1993, a more prestigious and autonomous designation in the NIH infrastructure. Patricia Grady has served as the Director of the NINR since 1995 (NINR & Cantelon, 2010).

Despite the progress that has been made since 1985, the NINR's budget (\$144,590,000 in fiscal year 2012) represents only .47% of NIH's overall budget. In fiscal year 2012, the majority of NINR's budget was committed to competitive research project grants, including small business grants (71%), followed by 10% for research management support, 6% for training, and 5% for the intramural program. It is important to note that nurse scientists are funded from an array of other institutes at NIH, and non-nurse scientists are also funded by NINR. NINR's current strategic plan – *Bringing Science to Life* – focuses on health promotion and disease prevention, advancing quality of life, symptom management, palliative and end-of-life care, promoting innovation, and investing in nurse scientists. Unfortunately, the US is currently faced with sequestration, which requires that NIH cut 5% of its fiscal year 2013 and 2014 budgets, with additional funding cuts possible. It is not likely that NINR, nor NIH, will see increased levels of funding, and there is growing concern about the impact that the cuts will have on the research programs of the next generation of scientists.

A New Funding Opportunity – PCORI

In addition to NINR, support for nursing research in the US has emerged through some newly funded federal initiatives. The Patient Centered Outcomes Research Institute (PCORI) was authorized by the US Congress as part of the 2010 Patient Protection and Affordable Care Act (ACA). PCORI's mission is to help people “make informed healthcare decisions, and [improve] healthcare delivery and outcomes, by producing and promoting high integrity, evidence-based information that comes from research guided by patients, caregivers and the broader health care community” (see <http://www.pcori.org/about-us/mission-and-vision>). PCORI's research priorities include the assessment of options for diagnosis and treatment, improving healthcare systems, communication and dissemination of research, addressing healthcare disparities, and accelerating patient centered outcomes research and methodological research. As of October 2013, PCORI had funded 197 research projects, in 36 states, for a total of \$273.5 million. Examples of nurse scientists who have been funded are provided in Table 1.

Table 1. A Sampling of Nurse Scientists funded by PCORI

Scientist	Project Title	Affiliation
Kathleen Delaney	CARE: Patient-Centered Quality Assessment of Psychiatric Inpatient Environments	Rush University College of Nursing
Susan McMillan	Patient Outcomes of a Self-Care Management Approach to Cancer Symptoms: A Clinical Trial	University of South Florida College of Nursing
Debra Kay Moser	Reducing Health Disparities in Appalachians with Multiple Cardiovascular Disease Risk Factors	University of Kentucky College of Nursing
Helena Temkin-Greener	Improving Palliative and End-of-Life Care in Nursing Homes	University of Rochester
Beverly Thorn	Reducing Disparities with Literacy-Adapted Psychosocial Treatments for Chronic Pain: A Comparative Trial	University of Alabama, Tuscaloosa

National Center for Advancing Translational Science (NCATS)

Another opportunity for nurse researchers to engage in scientific work has recently emerged with the creation of the National Center for Advancing Translational Science (www.ncats.nih.gov) in December 2011. The mission of the center is to catalyze the generation of innovative technologies that will enhance the development, testing, and implementation of diagnostics and therapeutics across a wide range of human diseases and conditions. A primary focus of NCATS' work is to decrease the amount of time it takes for bench discoveries to impact bedside care. Multiple challenges exist in conducting clinical and translational research, including increasing research costs and complexity, a shortage of robust information systems, increased regulatory burdens, low patient recruitment and retention in clinical research studies, as well as difficulties in recruiting, mentoring, and retaining a critical mass of qualified clinical and translational

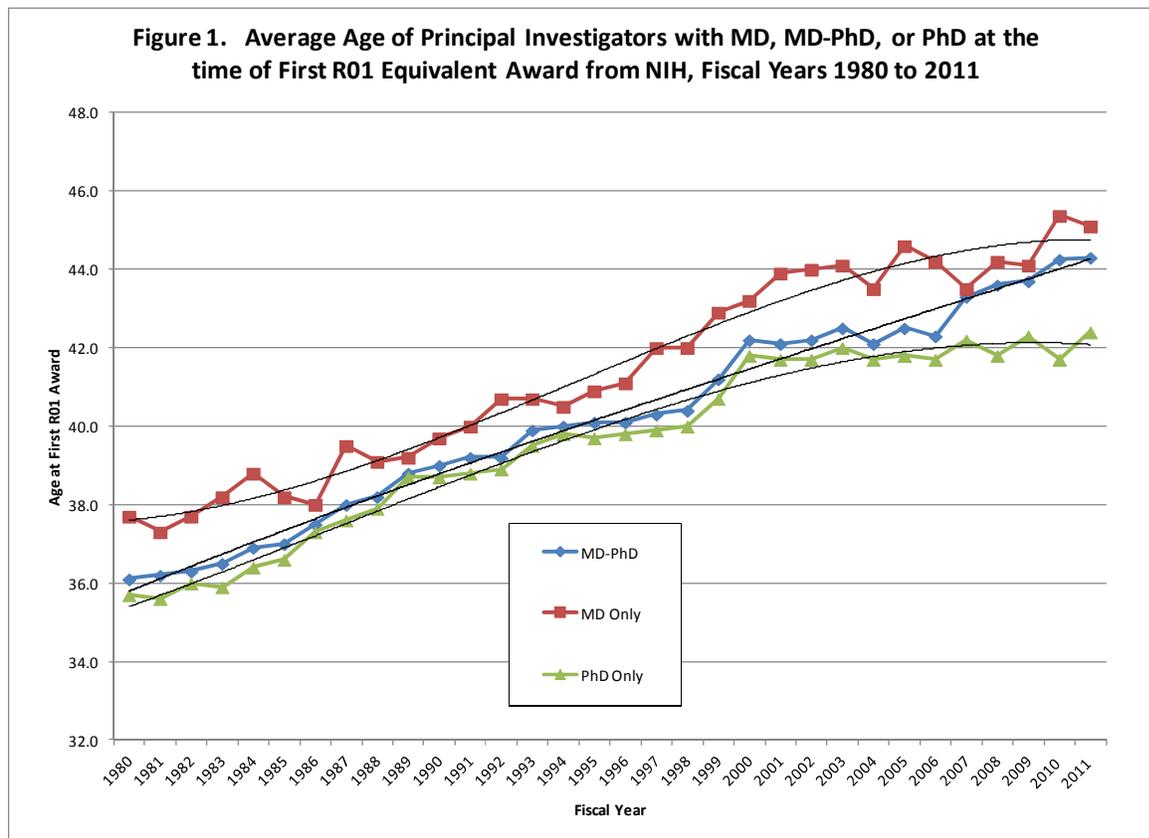
investigators. By addressing these concerns and accelerating “bedside to curbside” innovations, NCATS is working to mobilize health researchers in teams with the goal of taking best practices to the people living in the community. Nurses, as the healthcare provider who spends the most time with patients, play a pivotal role in this translational research activity. In fact, 50 nursing schools are currently serving as partners in the 60 research sites currently funded through Clinical and Translation Science Awards administered by NCATS (Sampselle, Knafl, Jacob, & McClosky, 2013).

Setting Expectations for the Research Degree

The American Association of Colleges of Nursing (AACN) is the premier nursing organization representing academic institutions that house baccalaureate and graduate degree nursing programs in the US. AACN represents 742 academic institutions with professional nursing education programs, including all academic institutions that grant research-focused doctoral degrees. AACN has a long history of setting standards and guidelines for nursing education programs offered at the baccalaureate, master’s, and doctoral levels. *The Research-Focused Doctoral Program in Nursing: Pathways to Excellence* position statement was adopted by the AACN membership in 2010 as a set of expectations for doctoral programs preparing nurse scientists. These guidelines focus on the academic resources and curricular elements that are critical to the education of nurse researchers. Essential academic resources including the faculty, facilities, and funding necessary to support doctoral level education also are identified.

In addition to acting as a guideline, the position statement features indicators of quality in research-focused doctoral programs. Among the core expectations are that graduates, having mastered the breadth of the discipline of nursing as well as the depth of a particular area of related science, will have the ability to generate new research, serve as a steward of the discipline, and educate and mentor the next generation of scientists. Quality programs are expected to have strong curriculum, qualified faculty, including seasoned researchers who represent a diversity of interests and intellectual perspectives, and qualified students whose research interests are congruent with those of the faculty. Given the focus on preparing scientists, the institution must have an array of resources that undergird the research-intensive environment. Finally, the program must have a systematic and ongoing evaluation plan that assesses the extent to which the graduates attain the desired program outcomes, as well as how the program meets the standards of the parent institution and national benchmarks for research-focused doctoral programs in nursing.

The document also focuses on the need to expand dramatically the number of nurse researchers and the need to support earlier transition by nurses to the terminal degree. While Figure 1 is not limited to nurse scientists, it’s clear that the age at which investigators receive their first NIH Research Project Grant (R01), or equivalent grant, has dramatically increased over the past 30 years (NIH, 2013). The R01 is the original and historically oldest NIH grant mechanism that supports health-related research consistent with the NIH’s mission.



Source: National Institutes of Health Office of Extramural Research, 2013

With a long history of advocating for quality nursing research and setting standards for research-focused doctoral degrees, AACN held the nation's first PhD Summit in September 2013 to bring stakeholders together to assess the changing nature of research and shape the development of academic programs that prepare nurse scientists. Titled *A National Dialogue on the Future of Nursing Science and the Research-Focused Doctorate*, nursing deans, associate deans, and faculty came together with practice and policy leaders to consider how maintaining a robust nursing research agenda is critical to the evolution of nursing practice and how nurses are educated to provide optimal, evidence-based care. Among the many questions addressed at the PhD Summit were the following:

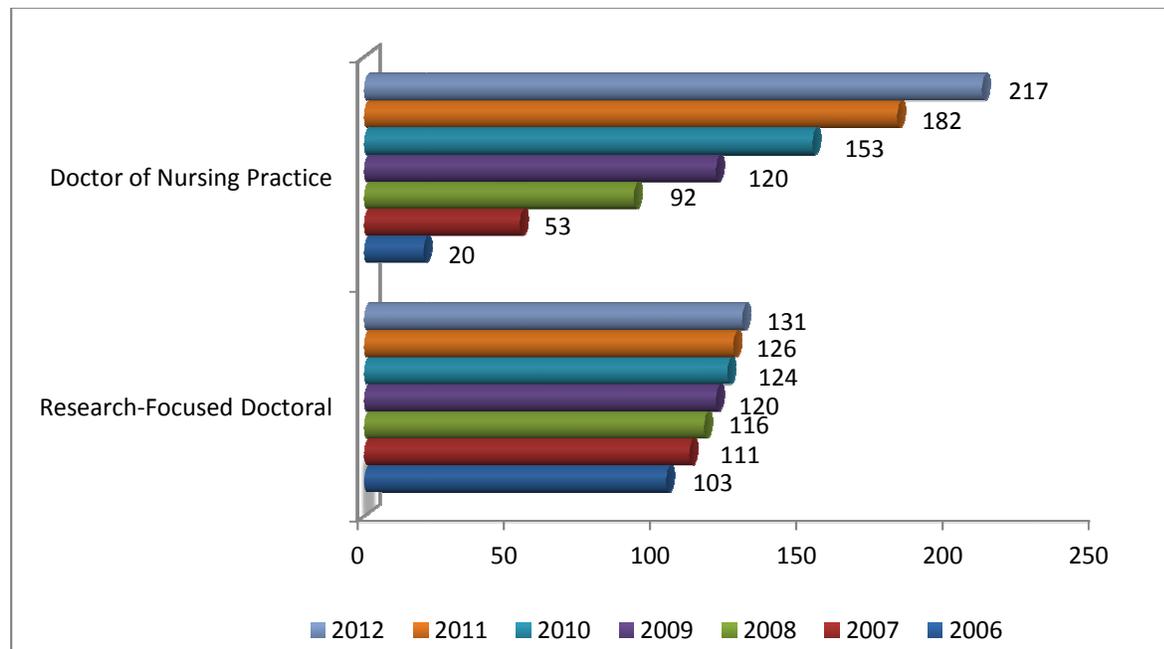
- How will the changing nature of research – including interprofessional teams and translational science – impact the preparation of nurse scientists?
- How can faculty best educate and manage a different generation of PhD students?
- What opportunities and challenges exist with post-baccalaureate and online programs leading to the PhD?
- What supports are needed to ensure PhD graduates engage in meaningful research?
- How do PhD programs prepare students to identify and address complex healthcare questions?
- What research areas need further exploration by nurse scientists?
- What resources are needed to sustain a successful research enterprise?

Findings from the summit are helping to shape AACN's strategic priorities related to doctoral level nursing education and will impact the development of future educational programming and faculty resources.

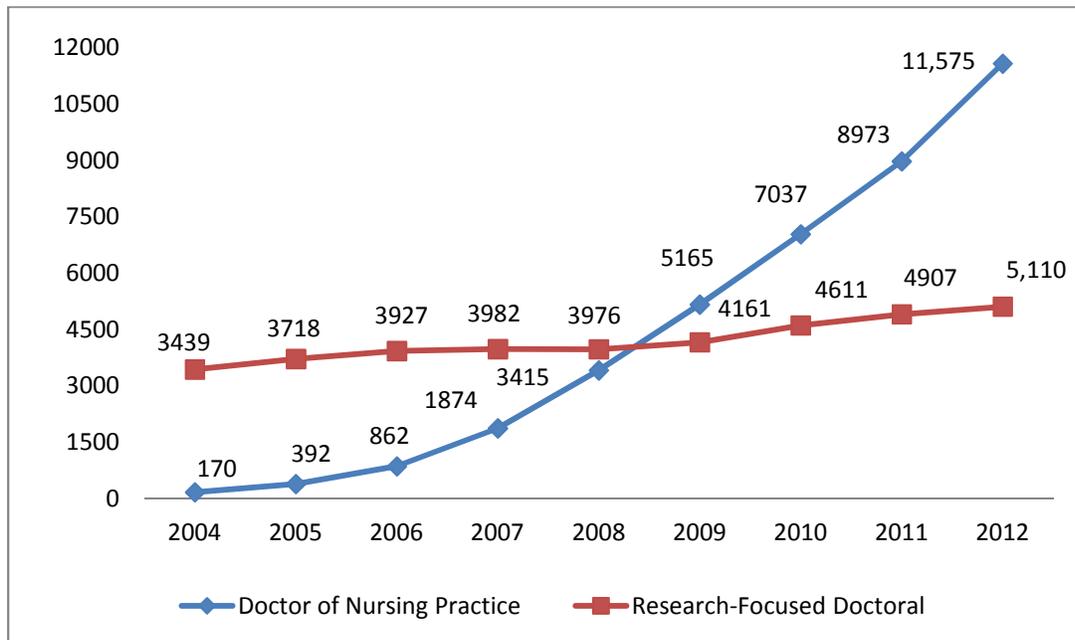
Expanding Interest in Doctoral Nursing Education

While research-intensive doctoral programs have been in existence for over 30 years in the United States, practice doctorates in nursing have been few in number until the last decade. In 2004, AACN's membership endorsed a position statement in support of the Doctor of Nursing Practice (DNP) degree as the appropriate level of education for clinicians working at the highest level of nursing practice (AACN, 2004). This decision provides nurses in the US with two pathways to the terminal degree in nursing: the research-focused degree as the source of new evidence for practice (PhD or DNS) and the practice doctorate (DNP). While moving to the DNP raised some initial concerns that this would erode enrollments in research-intensive doctoral programs, having two options has actually generated strong interest among nurses seeking careers in both research and practice. Growth in the number of doctoral programs and student enrollment in the two types of terminal degrees is depicted in Figures 2 and 3.

Figure 2. Growth in Doctoral Nursing Programs in the US: 2006-2012



Source: American Association of Colleges of Nursing Institutional Data Service.

Figure 3. Enrollments in Both DNP and PhD Programs 2004-2012

Source: American Association of Colleges of Nursing Institutional Data Service.

Currently there are 217 DNP programs enrolling students nationwide and 131 PhD/DNS programs. In 2004 there were only 170 DNP students in the US; in 2012, a total of 11,575 DNP students were enrolled. During this same time period, enrollments in research-focused programs increased from 3,439 to 5,110 students. The growth in doctoral enrollments is helping to keep nursing education on target to accomplish the Institute of Medicine's *The Future of Nursing* 2010 recommendation to double the number of doctorally prepared nurses in the US by 2020 (IOM, 2010). More importantly, the synergistic relationships between nurses who create evidence and those who embed it into practice is transforming patient care and enhancing healthcare delivery. AACN expects to increasingly see DNP prepared nurses working with nurse scientists to improve practice and discover evidence gaps.

Strategies for Building the Research Enterprise

Post-doctoral programs.

While post-doctoral study is common in other biomedical disciplines, nurses completing their research-intensive doctoral programs have not routinely availed themselves of this opportunity. In 2012 there were only 29 nurses in post-doctoral programs, which reflected an increase of 5 new students enrolled at this level over the previous year (AACN, 2013). The post-doctoral experience has to be an area of focus within the discipline as we strive to increase the number of doctorally prepared nurses, ideally earlier in their nursing career, who can successfully launch a focused program of research. Post-doctoral programs serve as a bridge for new scientists as they become independent, productive researchers. In addition, these programs provide the new scientist with a venue to build his or her national network to engage in team science, a growing expectation within the US. Building on their doctoral study and research, post-doctoral fellows

are expected to develop more depth in an area of science and further enhance their expertise and skills for communicating within the scientific community, including through peer-reviewed venues, and securing external funding for their program of research.

NINR offers a mechanism for funding institution-based post-doctoral fellowships (i.e., T32). In addition, individuals can apply under the F31, F32, or F33 mechanisms (NINR, 2013). Known as the Ruth L. Kirschstein National Research Service Award (NRSA), the post-doctoral stipend in fiscal year 2012 ranged from \$39,264 (0 years of experience) to \$54,180 (7 or more years of experience). NRSA support is available for 3 years for postdoctoral fellows. NIH also offers the Pathway to Independence Award (K99/R00), which includes 1 to 2 years of mentored support and up to 3 years of independent support. Post-doctoral experiences are also available through NIH's intramural program.

Dean's and Faculty Partnerships.

Creating the research enterprise requires a multiplicity of approaches in which both the dean and faculty have critical roles. Leadership by both the dean and faculty is crucial to creating a thriving program of research. By partnering together, the vision of a vibrant research enterprise can be achieved as each has specific roles to play.

The dean can facilitate a broad culture of scholarship by enhancing the research productivity of all faculty (Kulage et al., 2013; Travis & Anthony 2011). Deans recruit and identify faculty who are passionate about inquiry, set clear expectations of knowledge generation for all faculty - be it discovery or translation - and invest in the infrastructure to support faculty. For research-intensive/extensive institutions, no decision is more critical than assembling the right faculty, whose scientific interests complement and extend the institution's research mission. Each individual faculty member should be assessed for motivation, passion, knowledge, research abilities, and commitment. Candidates should be evaluated as to whether they have published their dissertation findings, completed post-doctoral training, and whether they have a clear vision for their research trajectory. Evidence of publications and obtaining grant funding is typically viewed positively. The hiring process itself is a time intensive process, engaging individuals within the nursing unit, the wider university, and the community to ensure the success of the individual. Hiring the faculty for success at the outset involves ensuring the potential recruit has a community of scholars who will be supportive and collaborative. The appointment, reappointment, promotion, and tenure process requires multiple reviews and frequent feedback to ensure that the faculty member is on track for a productive research career.

Deans may assist in the recruitment of research-intensive faculty by offering "recruitment packages". Most often these packages offer seed funding for research pilot projects, protected time to conduct research, equipment, space, staff, and a named endowment, for more senior faculty hires, which can provide additional fiscal support for students, travel, and other expenses related to research activities.

Sources for funding may come from a variety of areas such as return of indirect costs from the institution to the nursing unit, reallocation of unfunded faculty lines, clinical or translational science awards at the institutions, private philanthropic support, and system awards or discretionary accounts. Depending on the amount of intramural funding, the funding may start a research project or cover a faculty member's salary during the summer months if she or he is

appointed on a 9- or 10-month contract. It is not uncommon for pilot and/or research start-up funding and protected time for research to extend over a period of a few years, dependent on the individual.

Deans also must engage in selecting administrative faculty leaders who are responsible for the research mission both from a faculty and education perspective. Ensuring excellent research faculty leadership in positions such as Associate Dean for Research and PhD program director can influence a culture of scholarship. Individuals who can plan and direct programs of research within schools, while being savvy as to how to inspire and motivate the next generation, are necessary. Minnick and colleagues (2010a) have documented that there is variability in the background and experience of those who hold such positions and indicate there is clear need for succession planning.

Faculty also play a pivotal leadership role in fostering and providing a culture of scholarship and preparing the next generation of scientists. Faculty, ideally through a focused strategic planning process, set the research agenda based on the individual strengths of each faculty member, develop a conceptual model defining phenomena of interest unique to the school, engage in collaboration within and outside respective institutions and communities, and mentor emerging nursing scholars. Nolan and colleagues (2008) outline a clear path for orchestrating a program of research for a new faculty member. Faculty determine promotion and tenure criteria, which are essential for defining scholarship within the nursing unit and university. Faculty researchers are integral in shaping the experience of students, both undergraduate and graduate students. Engaging undergraduate students in mentored experiences is essential to creating a pipeline for the future, and the benefits are mutual (Klemm, 2012).

Faculty researchers can provide students with positive pre-doctoral experiences to assist in developing the next generation of scholars. Evidence by the National Research Council (2005) support the fact that pre-doctoral trainees funded by NINR were more likely to have future success with career development or research awards. Further, faculty are responsible for ensuring the quality of the PhD program, its development, and ongoing evaluation benchmarking to recommendations set by AACN. Matching student and faculty research interests while also aligning mentoring and research experiences can help to ensure quality programs (Minnick, Norman, Donaghey, Fisher, & McKirgan, 2010b).

Additionally, faculty are responsible for other important elements of creating a successful research enterprise, including establishing formal policies and procedures for mock reviews. Faculty often develop both formal and informal mentoring programs, which are critical to the formation of future nurse scientists. Faculty are also uniquely qualified to create opportunities to engage with communities to solve health issues in meaningful ways, an essential component of the new patient-centered research initiatives (Duke & Moss, 2009).

Creating an Office of Research.

Supporting an office to provide the critical infrastructure for research can make a difference, not just for nursing, but for other disciplines as well (Heitkemper et al., 2008). The Roadmap initiatives for the NIH encourage this competition and collaboration. There are a variety of ways to construct such an environment, but essential elements include providing space, a convener

function, and a “matchmaker” to help multiple schools or disciplines come together to create new opportunities.

Personnel within an office for nursing research and scholarship may have varying roles and responsibilities depending on resources and the institution mission. Typically led by an Associate Dean for Research, who may or may not be a nurse scientist, the staff may include statisticians, grant writers, research project coordinators, lab managers and /or technicians, post grant managers, editors, writing coaches, librarians, and administrative assistants; all of whom are dedicated to advancing the research mission. Functions typically assumed by such an office include conducting grant writing workshops, identifying prospective grant opportunities that match faculty interest at the local, state, and federal levels, facilitating grant submissions, and working with the development office to create listings of local, regional, and state foundations which match faculty interest. Specific services to assist researchers might include arranging the logistics of external consultants for grant reviews, setting up mock grant reviews, convening meetings on behalf of faculty, and providing time saving administrative support.

A major role of such an office is to be the disseminator of all the research activities of faculty and students. Offices may formally organize annual research symposiums highlighting new breakthrough discoveries and new research methodologies. These offices may also host visiting scholars and sponsor monthly journal clubs focused on facilitating translational research and dissemination of findings.

Conclusion

Nursing continues to evolve to meet the healthcare needs of patients. The generation of new knowledge as well as the need to optimize the use of evidence in practice has never been more important, especially as health care in the United States is undergoing reform. Despite federal constraints on research funding, nursing must stay focused on the generation of new knowledge and the preparation of the next generation of scientists. We must continue to accelerate nurses pursuing research-intensive doctoral education at an earlier age to optimize the contributions over the course of their careers. As a discipline, it is important that we consider what the big challenges are that only nursing can answer (Gillis, 2010), and we must leverage all funding opportunities.

Deans of Schools of Nursing must continue to invest in supporting doctoral students, post-doctoral fellows, and faculty to be successful in their endeavors across all the missions of their home institutions (Chaudhry & Prelock, 2012). Truly fostering ongoing programs of research and the preparation of new nurse scientists is more likely to occur in academic health centers, which have multiple health profession disciplines and a broader base of expertise that supports team-based science. Nursing faculty affiliated with research-intensive doctoral programs must also engage in ongoing curriculum work that assures that our graduates and post-doctoral fellows are prepared to actively contribute to team-based science and have the needed knowledge and skills to compete for limited grant funds.

References

- American Association of Colleges of Nursing. (2001). Indicators of quality in research-focused doctoral programs in nursing. (Position statement). Accessed online at <http://www.aacn.nche.edu/publications/position-statements>.
- American Association of Colleges of Nursing (2004). Position statement on the practice doctorate in nursing. Accessed online at <http://www.aacn.nche.edu/publications/position/DNPpositionstatement.pdf>.
- American Association of Colleges of Nursing (2010). The research-focused doctoral program in nursing: Pathways to excellence. (Position statement). Accessed online at <http://www.aacn.nche.edu/education-resources/PhDPosition.pdf>.
- American Association of Colleges of Nursing (2013). *2012-2013 Enrollment and graduations in baccalaureate and graduate programs in nursing*. Washington, DC: Author.
- Chaudhry, C. A. & Prelock, P. A., (2012). Enhancing the Research and Scholarship Enterprise. *Nurse Educator*, 37(2), 54-55.
- DeLaune, S.C & Ladner, P.K. (2010). *The fundamentals of nursing: Standards and practices* (4th ed.). Cengage Learning: Stamford, CT.
- Duke, J. & Moss, C. (2009). Re-visiting Scholarly Community Engagement in the Contemporary Research Assessment Environments of Australasian Universities. *Contemporary Nurse*, 32(1-2), 30-41.
- Health Resources and Services Administration. (2010). *The registered nurse population: Findings from the 2008 National Sample Survey of Registered Nurses*. U.S. Department of Health and Human Services: Rockville, MD.
- Gilliss, C. (2010). The Grand Challenges and Nursing. *Nursing Outlook*, 58(2), 66-67.
- Grace, H. (1978). The Development of Doctoral Education in Nursing: In Historical Perspective. *Journal of Nursing Education*, 17(4), 17-27.
- Heitkemper, M., McGrath, B., Killien, M., Jarrett, M., Landis, C., Lentz, M., . . . Hayward, K. (2008). The Role of Centers in Fostering Interdisciplinary Research. *Nursing Outlook*, 56(3), 115-122.
- Institute of Medicine. (2010). *The Future of Nursing: Leading Change, Advancing Health*. Washington, DC: National Academies Press.
- Klemm, P. (2012). Conducting Nursing Research with Undergraduate Students: A Collaborative, Participatory Approach. *Nurse Educator*, 37(1), 10-11.
- Kulage, K. M., Ardizzone, L., Enlow, W., Hickey, K., Jeon, C., Kearney, J., . . . Larson, E. L. (2013). Refocusing Research Priorities in Schools of Nursing. *Journal of Professional Nursing*, 29(4), 191-196.
- Minnick, A. F., Norman, L. D., Donaghey, B., Fisher, L. W., & McKirgan, I. M. (2010a). Leadership in Doctoral Nursing Research Programs. *Journal of Nursing Education*, 49(9), 504-510.

- Minnick, A. F., Norman, L. D., Donaghey, B., Fisher, L. W., & McKirgan, I. M., (2010b). Defining and describing capacity issues in US doctoral nursing research programs. *Nursing Outlook*, 58(1), 36-43.
- Moule, P. & Goodman, M. (2009). Research in nursing. In: *Nursing Research: An Introduction*. Sage Publications: London.
- National Institutes of Health. (2013). New and early stage investigators policies. Accessed at http://grants.nih.gov/grants/new_investigators/new_investigator_data_1980_to_2011.ppt.
- National Institute of Nursing Research. (2013). Training opportunities (extramural). Accessed online at <http://www.ninr.nih.gov/training/trainingopportunitiesextramural#.UqdQAr53uA4>.
- National Institute of Nursing Research & Cantelon, P. (2010). *NINR: Bringing science to life*. NINR: Rockville, MD.
- National Research Council. (2005). *Advancing the nation's health needs*. National Academies Press: Washington, DC.
- Nolan, M. T., Wenzel, J., Han, H., Allen, J. K., Paez, K. A., & Mock, V. (2008). Advancing a Program of Research within a Nursing Faculty Role. *Journal of Professional Nursing*, 24(6), 364-370.
- Sarkis, J. M. & Conners, V. L. (1986). Nursing Research: Historical Background and Teaching Information Strategies. *Bulletin of the Medical Library Association*, 74(2), 121-125.
- Sampselle, C.M., Knafl, K.A., Jacob, J.D., & McCloskey, D.J. (2013). Nurse engagement and contributions to the clinical and translational science awards initiative. *Clinical and Translational Science*, 6(3), 191-195.
- Travis, L. & Anthony, M. K. (2011). Energizing the Research Enterprise at Non-academic Health Center Schools of Nursing. *Journal of Professional Nursing*, 27(4), 215-220.
- Webb, J. J. (2011). Nursing research and evidence-based practice. In: *Contemporary nursing: issues, trends, and management*. Elsevier: St. Louis.
- Wheeler, E., Hardie, T., Schell, K., & Plowfield, L. (2008). Symbiosis-Undergraduate Research Mentoring and Faculty Scholarship in Nursing. *Nursing Outlook*, 56(1), 9-15.