As the national voice for America's university and four-year college nursing education programs, the American Association of Colleges of Nursing (AACN) is dedicated to the improvement of the public's health by furthering nursing education, research, and clinical practice. Via its membership, AACN facilitates the conduct of research as well as the utilization of research findings through the education of professional nurses and nurse scientists.

This statement focuses on the research mission of schools of nursing and outlines AACN's position on the focus, culture, and infrastructure required to meet the research mission of the academic nursing community.

Nursing Research: Vital to the Health of the Public

The United States provides unprecedented global leadership in biotechnology, science, and research. Over the past few decades, the record of biomedical discovery, technologic innovation, and medical therapeutics has been spectacular. The nation also commands research leadership in the humanities, social sciences, communications, and educational methods. Moreover, the manner by which individuals and populations learn, live, develop, adapt, and measure the quality of life has been advanced. Research conducted by nurses and research about nurses and nursing has been a part of these major advances in the past few decades; and there has been a dramatic increase in the quantity and quality of nursing research.

The essence of a discipline is its body of scientific knowledge, its system of values and ethics, and its societal worth. In a practice discipline such as nursing, there is the added dimension of the thoughtful and discriminating application of knowledge from many fields of human endeavor. It is this complex relationship between the building of a body of science, the utilization of knowledge from other disciplines, and the application to practice that poses opportunities and challenges for scholarship within the academic nursing community.

Nursing Research: A Vital Partner in the Development of the Health-Related Research Spectrum

Although many nurses conduct autonomous biomedical research in a variety of fields and work collaboratively as part of interdisciplinary research teams, nurse researchers make unique, independent contributions to the public's health. Nursing takes an expanded view of health by emphasizing health promotion, restoration, and rehabilitation, as well as a commitment to caring and comfort. Nursing research, for example, frequently focuses on fostering healthy lifestyles and improving health outcomes for individuals, families, and communities. Particular attention is given to vulnerable groups such as the elderly and their caregivers, preterm and low-birthweight infants, abused children, rural and urban youth, pregnant teenagers, victims of violence, the depressed, and the critically ill. Nurse researchers study how to assist individuals and groups as they respond to health and illness experiences (e.g., reducing side effects of illness and treatment); and address social and behavioral aspects of illness and quality of life components.

Nursing research also focuses on health systems and outcomes in order to identify ways in which the organization and delivery of health care influences quality, cost, and the experience of patients and their families. While research on such topics is not exclusive to any single discipline, nurses have a particular focus that brings important balance to the health/biomedical research agenda for the nation. The nursing
research priorities identified by the American Nurses Association's position paper, Direction for Nursing Research: Toward the Twenty-First Century, illustrate the vital contributions of nurse scientists.(1)

The focus of biomedical science on the discovery of disease causation and cure is essential but not sufficient alone to improve health. Despite the dramatic successes of improved diagnostic and therapeutic modalities, the overall impact on the health of the public still requires more attention. Less dramatic strides have been made in disease prevention; the equitable, efficient and humane delivery of care; and improvements in societal indicators of health, such as infant mortality and life expectancy rates. Some diseases are better prevented than treated, others simply cannot be cured, and suffering and irreversible changes such as aging are part of the human experience. Indeed, health can be far better maintained when it is viewed in the broader context of lifestyle, culture, and socio-economics.

As an additional component of the broader continuum of health-related research, health services research is particularly concerned with issues of organization, delivery, financing, quality, patient and provider behavior, effectiveness, cost, and outcomes. It evaluates both clinical services and systematic structures in which those services are delivered. Both basic and applied research questions are addressed. Biomedical and health services research comprise the health-related research continuum and have overlapping boundaries that reduce the risk of gaps and support the relationship between the different areas of research focus.(2)

As the health care environment continues to change rapidly, the consolidation of health plans and the movement of patients and providers into managed care settings continues. The containment of costs, continued problems with access, and efforts to develop quality care have increased the demand for nurse researchers to broaden their understanding of the research continuum to include the development of knowledge and skills in health services research.

Scholarly environments require the integration of various approaches to inquiry. Faculty, in concert with the mission of their institution, need to approach their work as scientists with rigorous inquiry and reflective thought. Many faculty will concentrate on the advancement of the knowledge domain of the discipline, which will enhance the practice of nursing. Other faculty will focus on advancing knowledge of how students learn in the clinical discipline of nursing, which requires the systematic assessment of the teaching-learning process using rigorous research strategies. Collaborative inquiry into both domains can result not only in a better understanding of and coherence in the entire discipline, but also in an understanding of how knowledge from one conceptual area complements and extends learning in another. While research in both domains is important, the purpose of this paper is to describe the essential elements required to ensure that the contributions of nursing research to the health of the public are made.

Creating a Research Culture and Workforce for Nursing

Any research enterprise can thrive only when there are certain prerequisites, including a supportive culture, strong mentoring, educational programs to ensure a research workforce, and an infrastructure and funding mechanisms to support the research.

The culture for research generally develops within academic institutions, in which knowledge development, discourse, and debate are expected and encouraged. Schools of nursing that offer baccalaureate, master's, doctoral, or postdoctoral education build a knowledge base for the discipline and produce professionals who are able to use that knowledge in professional practice.

University and four-year-college-based schools of nursing prepare professional nurses capable of using scientific knowledge in their practice and contributing to new knowledge. Health-related research, whether biomedical, clinical, health care services, public health or health care policy, is an integral part of all nursing curricula. All baccalaureate nursing programs are committed to teaching and integrating nursing's research base into curricula. Teaching from such a research base results in professional graduates who
provide evidence-based practice. Master’s programs in nursing build on the baccalaureate base of critical thinking to advance the depth and competence of graduates. Doctoral and postdoctoral programs provide the strong research preparation required to generate knowledge relevant to nursing practice and advance the profession's contribution to enhancing the health and health care of individuals, families, and communities. The research expectations and outcomes of the graduates at each level of nursing education are described below:

- **Baccalaureate programs** prepare nurses with a basic understanding of the processes of research. The goal is that the graduate is able to review and use research findings from nursing and other disciplines that can be applied in their clinical practice. These graduates may be involved in teams with nurse scientists or other researchers to plan and implement changes in the organization or delivery of care based on research, or they may serve as data collectors and research assistants.

- **Master's programs** prepare nurses to critique research and to implement changes in practice based on research data. Their leadership skills enable them to form teams of professionals, and to initiate and evaluate new practice policies and programs within their agencies and professional groups. They identify practice and systems problems that need to be studied and collaborate with other scientists to generate new studies based on their expertise.

- **Doctoral programs** prepare nurse scientists for the beginning researcher role. These individuals are able to conduct nursing research independently, preferably with a senior researcher in the early years as they establish their funded research program(s). These nurse investigators also are able to facilitate teams of clinicians and researchers in planning and conducting studies.

- **Postdoctoral programs** provide nurse scientists not only with a period of time devoted fully to developing research skills, but also a research program with the mentorship of a senior investigator. Nurse scientists conduct the early phases of a research program and plan for ensuing phases. Postdoctoral fellows are generally expected to submit an initial application for funding for the next phase of their research program. Establishing nurse scientists in postdoctoral study ensures that research is firmly started before these individuals assume the multiple roles expected in an academic, clinical, or administrative position.

Formal academic programs are embedded in a long-term commitment to continuing scholarship and updating of knowledge and expertise required to conduct cutting-edge research. Future nurse researchers need to be in schools where the administration is strongly committed to research, faculty are active investigators with funded research, and the environment is rich in collaboration and inquisitive spirit. These are the types of schools that must take the lead in the preparation of nurse scientists. This research-intensive environment takes years to develop and must be protected to ensure a continued legacy of strong, relevant research.

The *Indicators of Quality in Doctoral Programs in Nursing*, adopted by AACN in 1993, outlines the major educational components required for nurse scientist preparation, including faculty with appropriate expertise, programs of study, resources, students, and research characteristics. (3) The quality of doctoral programs has been correlated to the future graduates’ productivity as nurse researchers. (4)

An effective research culture to prepare excellent nurse scientists is characterized by:

- faculty with long-term commitment and productivity as nurse scientists and educators, including the availability of senior investigators and mentors;
- opportunities for postdoctoral study;
- interdisciplinary research and educational experiences for nurse investigators; and
• a strong research environment.

Providing a Research Infrastructure and Funding

To generate the science base for nursing practice and educate future generations of nurse scientists, the requisite infrastructure must be strong. Support for research must be present within departments and schools, in the larger academic institution, and at the national level.

The importance placed on the research mission by the larger institution has a major impact on the nursing school's research environment. In research-intensive environments, support is evident in the hiring and retention packages provided for investigators, in the peer and administrative review mechanisms used for appointments and promotions, and in the availability of start-up research funds available to faculty. It is in this kind of university environment that nurse scientists participate and in which they lead interdisciplinary research activities. Interdisciplinary work provides the opportunity to understand the complex nature of many scientific problems and to exchange views and collaborate in teams of committed scientists. In this setting, research permeates the entire academic enterprise.

Schools of nursing must provide the training ground for the next generation of nurse scientists. The infrastructure may include an office or center for research, concentrated centers or areas of research excellence, formative and summative mock reviews of grant applications and manuscripts, informal or formal mentorship programs, visiting scholars, and external consultants. The research productivity of the faculty, including grants obtained and manuscripts published, the number of doctorally prepared graduate faculty, and the successes of graduates of doctoral programs are indicators that the environment is one in which faculty research will flourish.

Research infrastructure at the national level is also critical. Journals providing peer review of manuscripts and regional and national conferences in which peer-reviewed research presentations are included provide opportunity for nurse scientists to present their work for scrutiny and consideration by colleagues. The National Institute for Nursing Research (NINR) at the National Institutes of Health (NIH), as well as other NIH institutes, provide federal funding for nursing research as well as support for research training for pre- and post-doctoral students, new investigators, and mid-career researchers. The Agency for Health Care Policy and Research (AHCPR), the lead agency for research on the outcomes, effectiveness, and quality of health care focuses on the delivery of health care services in daily practice. AHCPR provides research funding conducted by all health professionals (including nursing). Professional, public, and private organizations also offer competitive research funding and training support.

Despite a documented need for more doctorally prepared research faculty and postdoctoral training, the quality of training will be compromised if the research environment is not supported adequately. Building the research infrastructure is vital to strengthening the impact that nursing research has on the public's health and health care outcomes; thus increasing the funding base is critical. Doctoral education must occur in schools of nursing that have sufficient numbers of research-productive faculty, and students must be exposed to researchers in a variety of related disciplines. In addition, access to statistical and technologic support are other components essential to the infrastructure for nurse scientists and students.

Challenges to the Research Mission

Nursing research faces a number of challenges stemming from rapid growth and diminishing resources. These challenges include:

1. Schools of nursing and affiliated health organizations are under major financial pressures to deliver educational and health services more competitively. This creates competing demands across academic institutions in general, and specifically, within the nursing education, research, and practice missions that require deliberate decisions on the value of research and maintaining the research infrastructure.
2. The management of large population-based data sets from multi-site and interdisciplinary studies mandates that nurse researchers are experienced in managing teams of researchers and collaborative projects. Many studies to date (in all disciplines, including nursing) have been conducted at single sites or with investigators of a single discipline.

3. Advancing nursing research requires more senior, experienced research team leaders who can develop centers of excellence in important fields of inquiry. This will require additional post-doctoral training opportunities, funding for research training, and enhanced research-intensive environments.

4. The growing opportunities for research partnerships with private and public industries create the need for schools of nursing to maintain vigilance over research integrity, conflicts of interest, and academic freedom.

5. Funding increases throughout the NIH, especially the NINR (the major source for nursing research support), have not kept pace with the growth of doctoral programs and the number of new doctorally prepared researchers, as well as the growth in senior nursing researchers who have major programs of research. Increased access to professional, public, and private funding sources also is needed.

6. Fostering evidence-based nursing practice and innovation will require a long-term commitment to developing more health services research studies to examine the impact of nursing processes and structures on the health care outcomes of patients and populations. Additionally, nursing education must develop nurses with basic and advanced degrees with the ability to use these research findings skillfully in their practice.

Nursing research has grown dramatically in the past few decades and has had a vital impact on the public's health and well-being. Given continued university and school support, as well as the necessary public support and funding, nursing schools and researchers will continue to make contributions to the health of people around the world. In order to ensure an effective research enterprise, four essential elements -- a research culture, quality education to prepare a workforce of nurse scientists, a sound research infrastructure, and sufficient funding -- must be supported vigorously and allowed to flourish.

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