Nursing Science: Claiming the Future

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Abstract

Purpose: The National Institute of Nursing Research (NINR) is dedicated to improving health and health care through the funding of nursing science and research training. With a focus on guiding the nation’s nursing science research agenda and improving quality of life, the NINR is ideally positioned to meet current healthcare challenges and anticipate future challenges and priorities. In this article, coinciding with the NINR’s 30th anniversary, examples of NINR-supported research are described, along with its training activities designed to develop a strong cadre of 21st century nurse scientists. In addition, we discuss priorities and future directions for advancing cutting-edge nursing science to “claim the future” and improve the health of the nation over the next 30 years and beyond.

Clinical Relevance: The evidence base developed by nurse scientists informs clinical practice, promotes health, and improves the lives of individuals across the lifespan. NINR-supported research has had a profound impact on health over the past 30 years and is ideally positioned to continue to address the most important health challenges now and in the coming decades.

Throughout its 30-year history, the National Institute of Nursing Research (NINR) has been instrumental in establishing the scientific foundation for health and health care. The NINR stimulates innovation in nursing science by building bridges across basic, clinical, and community-based science. NINR-supported scientists conduct interdisciplinary research across traditional boundaries to better understand the experiences of individuals and families living with chronic health conditions and to develop personalized approaches that maximize the health and well-being for individuals at all stages of life and across diverse populations and settings.

As one of 27 institutes and centers of the National Institutes of Health (NIH), the NINR occupies a unique and significant place within the NIH community, with a focus on guiding the nation’s nursing science research agenda and improving quality of life, as reflected in its mission to promote and improve the health of individuals, families, and communities.

As the NINR marks its 30th anniversary, the current healthcare environment poses challenges and opportunities that are particularly relevant to the NINR’s research interests, including changing demographics linked to multicultural diversity and a population that is living longer with an increased likelihood of multiple chronic illnesses. In partnership with their healthcare providers, individuals with chronic and often complex conditions now play a key role in guiding their own care through self-management. As a consequence, family and friends have greater roles as caregivers and are an important source of support. Health disparities and a lack of access to health care continue to be a challenge to the health and well-being of some communities. Healthcare system reforms have led to new healthcare policies as the demand for improved and more accessible preventive and primary care services grows and policy-makers and other stakeholders require more value for their healthcare investment. Innovative approaches and tools, such as precision medicine that individualizes prevention and treatment, and data science, which has the potential to advance the understanding of human health, have emerged as promising opportunities to improve health outcomes and quality of life.
Implementing the NINR’s Strategic Plan to Address Health Care Challenges Through Nursing Science

While the current healthcare environment poses challenges, it also represents opportunities for the NINR and nursing science community to claim the future by addressing the challenges with thoughtful, innovative, and interdisciplinary approaches. The NINR Strategic Plan seeks to harness the strengths of nursing science to drive an ambitious research agenda that will meet current and future healthcare needs and anticipate future health challenges and priorities (NINR, 2011). Past scientific accomplishments help to inform the implementation of the Strategic Plan through four key themes: symptom science—promoting personalized health strategies; wellness—promoting health and preventing illness; self-management—improving quality of life for individuals with chronic illness; and end-of-life and palliative care (EOL PC)—the science of compassion. The NINR’s research activities continue to evolve to address these healthcare challenges. The following section provides examples of NINR-supported research findings and outreach initiatives for each of the themes.

Symptom Science—Promoting Personalized Health Strategies

The NINR’s symptom science portfolio covers the lifespan to promote personalized health strategies, and to provide a better understanding of chronic illness and improve quality of life. Symptom science focuses on understanding the biological and genetic basis of symptoms to improve the management of pain, fatigue, sleep disorders, and other symptoms. For instance, one study identified factors that influence care seeking for pain in young adults with sickle cell disease. These young adults often delay seeking clinical treatment of their pain, so understanding the barriers to care seeking is important to help them better manage their pain and know when to look for help. In this study, the majority of subjects waited to find help until their pain levels were quite high, and some noted that more intense and visible pain led to faster and better treatment. Because of past negative experiences, avoidance of treatment from the emergency department is common. These findings reveal that young adults with sickle cell disease need additional support from family and providers to make timely and appropriate decisions about health care (Jenerette, Brewer, & Ataga, 2014).

Another area of scientific focus is that of symptom clusters. Several research teams are characterizing symptom clusters—symptoms that occur together and are interrelated—with the idea that treatments designed for groups of symptoms may provide better outcomes than targeting individual symptoms themselves. A study of patients with breast cancer analyzed changes in a cluster of five symptoms (cognitive disturbance, fatigue, insomnia, pain, and depressed mood) over the course of chemotherapy and radiation treatment and found these symptoms varied in intensity across the treatment course (Kim, McDermott, & Barsevick, 2014). Understanding the mechanisms contributing to these symptom patterns can guide clinicians in the development of personalized interventions and can improve patient outcomes. Symptom clusters among heart failure patients have also been studied across various international cultures. Despite the diversity in cultures, the symptoms identified were found to cluster similarly among all the cultural groups (Moser et al., 2014). The identification of similar symptom clusters among heart failure patients may improve symptom recognition by both patients and healthcare providers.

Wellness—Promoting Health and Preventing Illness

Preventing illness is fundamental to addressing many of today’s healthcare challenges. Nursing science seeks to promote health and prevent illness. For example, recognizing an unmet need for high-quality early childcare programs that promote health in communities with high levels of poverty, an NINR-supported investigator designed, tested, and further refined the innovative Chicago Parent Program in partnership with parents of young children in low-income communities (Breitenstein et al., 2012). The program successfully promoted healthy behaviors and reduced risky behaviors among young children and their families. Today, the Chicago Parent Program has been adopted by Head Start and is being delivered in numerous states and in major metropolitan areas.

In other NINR-funded research, an investigator and her colleagues reduced human immunodeficiency virus and acquired immunodeficiency syndrome (HIV/AIDS) risk behaviors in diverse populations of adolescents through their “Be Proud! Be Responsible!” and “Sister to Sister” programs (Jemmott, Jemmott, & O’Leary, 2007). Partnering with community-based organizations, including churches, clinics, and schools, the research team effectively translated and disseminated the research into prevention programs. This research has changed public policy related to HIV risk reduction interventions in community settings. The program has also been adapted by other groups to address HIV/AIDS and pregnancy risk behaviors in adolescent mothers (Koniak-Griffin et al.,
Self-management—Improving Quality of Life for Individuals With Chronic Illness

Self-management is an important component of the NINR’s research agenda and is increasingly relevant given the increasing prevalence of chronic illness. Self-management helps individuals with chronic conditions and their caregivers better understand and manage their illness and improve their health behaviors by developing effective approaches to deal with their illness and associated conditions (Grady & Lucio Gough, 2014). Effective self-management can improve quality of life while reducing the burden for both caregivers and the healthcare system. Some of the most successful efforts have been working with individuals managing chronic problems, including diabetes and cancer. Self-management is an approach where providers, patients, and families enter into partnerships to manage care across all aspects of treatment (McCorkle et al., 2011). In living with diabetes, patients practicing self-management must integrate numerous new activities into their daily lives. The identification of obstacles to diabetes self-management, such as literacy, is vital, especially in diverse and vulnerable populations (Wallace, Carlson, & Malone, 2010). Internet intervention programs have been successfully tested to reach teens with diabetes, allowing them to manage their health more independently and improving outcomes (Grey et al., 2013). In addition, NINR-supported researchers are contributing to the science of self-management for other chronic conditions such as asthma (Horner & Brown, 2014), arthritis (Parker et al., 2012), inflammatory bowel syndrome (Deechakawan, Cain, Jarrett, Burr, & Heitkemper, 2013), and chronic obstructive pulmonary disease (Nguyen et al., 2013).

Self-management programs are also targeting healthy teens to prevent the onset of obesity, often a precursor to a number of adult chronic conditions. For example, the Creating Opportunities for Personal Empowerment Program (COPE) Healthy Lifestyles Thinking, Emotions, Exercise, Nutrition (TEEN) Program is an NINR-supported school-based program intervention targeting obesity, social skills, and mental health in adolescents. COPE TEEN participants showed improved health behaviors and social skills, less severe depression, and better academic performance. Because this program is presented by teachers as part of the health education curricula in high school settings, it is a model of a feasible, cost-effective, and sustainable self-management program (Melnyk et al., 2014). Today, COPE TEEN has been implemented in schools in several states, at minimal cost per student, and has been adapted into a freshman-level college course at the Ohio State University. A program for adults is currently under development.

End-of-Life and Palliative Care—The Science of Compassion

End-of-life and palliative care—the science of compassion—is the fourth NINR theme. As the lead NIH institute for EOL research, the NINR supports science to assist individuals, families, and healthcare professionals in managing the symptoms of life-limiting conditions and planning for EOL decisions. In 2013, the NINR published Building Momentum: The Science of End-of-Life and Palliative Care. A Review of Research Trends and Funding, 1997–2010 (NINR, 2013). The report examined the trends in EOL PC research publications over 14 years, including information on federal research awards, funding patterns, and the contributions of public and private investments in EOL PC science. The report’s focus addressed the 1997 Institute of Medicine (IOM) recommendations for the scientific community to strengthen the research landscape, foster new evidence, and define and implement priorities for increasing the knowledge base for EOL PC (IOM, 1997). In addition, the Building Momentum report identified gaps that future research efforts could address and informed the subsequent IOM report Dying in America: Improving Quality and Honoring Individual Preferences Near the End of Life (IOM, 2014).

The NINR’s EOL PC supported-research portfolio addresses issues such as relieving symptoms and suffering, and understanding decision making by patients, caregivers, and providers. For instance, improving communication between patients, family members, and healthcare professionals is a critical area of study. Investigators are developing interventions to improve communication between family members and healthcare professionals about EOL PC. One such study includes the use of a “communication facilitator” in the intensive care unit (ICU) to help clinicians meet families’ needs for communication. An educational skills-building program...
is also being tested to help clinicians improve their communication skills during sensitive EOL situations. These studies show that factors such as length of stay in the ICU affect family members’ satisfaction with care; that improving communication about EOL care reduces stress, anxiety, and depression in family members; and that better outcomes are associated with clinicians following standardized communication guidelines with family members (Curtis, 2004).

**Cross Cutting Areas—Promoting Innovation: Technology to Improve Health**

Innovative technology to improve health is a focus area that cuts across the NINR’s research portfolio. Technology plays a critical role in advancing health care, and nursing science can provide the foundation for developing novel interventions that deliver personalized care and real-time health information to patients, families, clinicians, and communities. Recognizing a major technology gap in community healthcare diagnostics, the NINR provided support for investigations into portable, point-of-care diagnostics. Through the NINR’s small business technology transfer program, an interdisciplinary team of investigators developed and tested a portable, point-of-care, “lab-on-a-chip” diagnostic device—the mChip. The mChip is designed to detect HIV and associated co-infections, such as syphilis and herpes, which significantly increase the transmission of HIV (Chin et al., 2011). Notably, the mChip requires less than 1 μL of blood to simultaneously detect HIV and syphilis and does not require user interpretation of the signal, making it possible to perform these tests with ease and accuracy in remote locations and with low cost (Chin et al., 2013).

Hospital readmission is a common and costly problem that has been a target of recent healthcare system reform. Innovative tools can help clinicians identify patients in greatest need of post-acute care and potentially lower readmission rates. Recently, a team of researchers created an evidence-based decision support tool that integrates seamlessly with hospital electronic health record systems to help identify high-risk patients admitted to the hospital, so their care can be tailored to prevent readmissions. With support from a Small Business Innovation Research (SBIR) award from the NINR, the research team installed the tool in a three-hospital academic health system and compared readmission outcomes before and after implementation. They found a 33% reduction in 30-day readmissions and a 37% reduction in 60-day readmissions after implementation, suggesting that this evidence-based decision support tool results in better outcomes after discharge (Bowles et al., 2015).

**NINR Intramural Research—NIH Symptom Science Model and Precision Medicine**

The NINR Division of Intramural Research (DIR) was created in 1992 to develop and conduct research programs relevant to nursing practice and health care. In the years since, the DIR has remained dedicated to conducting basic and clinical research and now has an emphasis on defining the clinical and biologic features of symptoms common to a broad variety of conditions, including the development of personalized treatments. Built on this perspective, the DIR developed the NIH Symptom Science Model to guide research related to symptoms of illnesses, injuries (including traumatic brain injury), and conditions through identifying complex symptoms or clusters, characterizing symptom phenotypes, identifying biomarkers associated with symptoms and phenotypes, and developing clinical applications to reduce adverse symptoms and sequelae (Cashon & Grady, 2015).

The NIH Symptom Science Model is an example of the “real world” application of clinical “omics” science to improve health outcomes as reflected in the President’s Precision Medicine Initiative (The White House, 2015). As described in the Initiative, precision medicine is a new enterprise to revolutionize health care that will generate the scientific evidence needed to move the concept of precision medicine into everyday clinical practice. The emphasis of the DIR program on enhancing patient outcomes for individuals is aligned with the emergence of precision medicine as an approach for disease prevention and treatment that takes into account individual variations in genes, environment, and lifestyles. To develop the scientific foundation for personalized prevention and treatment strategies across diverse populations and settings, scientists in the DIR undertake leading edge symptom science research to determine the underlying biologic and behavioral mechanisms associated with a variety of disorders. Findings from these research programs will inform the development of novel clinical interventions to alleviate symptoms.

Recent research findings in NINR-DIR symptom science include the identification of two micro-RNAs linked to pain and inflammation that are elevated in irritable bowel syndrome patients and may act as potential biomarkers and/or therapeutic treatment targets (Fourie et al., 2014); discovering differential gene expression in military personnel with a history of blast-related traumatic brain injury during deployment compared to matched controls (Heinzelmann et al., 2014); uncovering evidence that genes related to energy production in cells are differentially expressed and associated with worsening fatigue during radiation therapy in prostate cancer.
patients (Hsiao, Wang, Kaushal, Chen, & Saligan, 2014); and the identification of a set of molecular pathways that may provide insights into the mechanisms of weight gain in kidney transplant recipients (Cashion et al., 2013).

**NINR Research and Leadership Training—21st Century Nurse Scientist: Innovative Strategies for Research Careers**

The development of a strong cadre of nurse scientists has been a primary goal of the NINR for the past 30 years. To continue to support advancements in science and improvements in health, it is essential that the scientific workforce of the future be innovative, multidisciplinary, and diverse. The NINR supports a wide range of activities to foster excellence in the next generation of nurse scientists. These include both extramural and intramural training opportunities.

NINR extramural training opportunities include fellowships and career development awards. Fellowship training opportunities are funded by the NINR for trainees in the extramural community such as universities, medical centers, and hospitals. These include the National Research Service Awards that enable scientists to be trained to conduct independent nursing research and to collaborate in interdisciplinary research through individual and institutional predoctoral, postdoctoral, and senior fellowships. NINR Career Development Awards provide support for independent investigators during various early and transition stages of their careers.

The DIR supports efforts to provide scientific leadership and intensive research training for enhancing the biologic and physiologic research foundation of the nurse scientist workforce. Through the DIR, the NINR supports a research fellows training program and several summer training initiatives. In particular, the DIR’s Summer Genetics Institute provides training in molecular genetics to build the research capacity of the nursing science community and to expand the use of genomic data in clinical practice. The Symptom Research Methodologies Boot Camp, a 1-week summer research training course, provides a foundation in the latest research methodologies. The focus of the most recent Boot Camp was “Big Data in Symptoms Research” and featured lectures by distinguished guest speakers, classroom discussion, and hands-on training. Many graduates of the NINR’s intramural training programs subsequently return to the extramural community as university faculty in nursing programs across the country (Cimino, 2014). These leaders are increasing the research capacity of schools of nursing and serving as mentors to future nurse scientists.

The NINR Graduate Partnerships Program (GPP) is a doctoral fellowship training program that coordinates training and funding for graduate students attending a school of nursing. It provides an exceptional opportunity for students who are enrolled in nursing PhD programs to complete dissertation research on the NIH campus (Engler, Austin, & Grady, 2014). The goal of the GPP is to encourage and support the training of nursing doctoral students who are motivated to undertake careers in basic or clinical research. NINR GPP fellows are trained in basic and clinical symptom science research skills and focus their dissertation research on the mechanisms of symptoms and symptom management, health promotion, disease prevention, tissue injury, and genetics.

**Claiming the Future of Nursing Science**

As the NINR looks forward beyond its 30th anniversary, the expertise, innovation, and leadership skills of nurse scientists and clinicians will be called upon to guide and shape practices and policies. In developing a research agenda and addressing healthcare challenges, the NINR will continue building the scientific foundation for clinical practice by engaging the scientific community and public in shaping the future of nursing science through initiatives such as the recent NINR Innovative Questions (IQ) Initiative (Grady, 2014, 2015b) and by identifying priority areas that will advance nursing and health science in the years to come.

**Innovative Questions Initiative**

The NINR Strategic Planning IQ Initiative, launched in November 2013, was inspired by similar successful efforts at the NIH and other organizations. It consisted of a series of workshops, each centered on one of the NINR’s science focus areas, and a public website, with the goal of initiating a dialogue with NINR stakeholders to identify novel scientific questions. The NINR solicited thoughts and ideas that would encourage new thinking and creativity in nursing science, explore unanswered questions, promote results-oriented research, and guide the science over the next 5 to 10 years. The workshops convened leading scientists and interdisciplinary experts to identify and refine innovative research questions. On the IQ website, members of the scientific community, professional organizations, and the general public were given the opportunity to submit innovative research questions directly to the NINR, and to comment on questions submitted by others.

Questions that resulted from the IQ initiative have been posted to the NINR website at www.ninr.nih.gov. These questions will serve as a valuable resource to the
NINR and the nursing science community in considering future research directions. A sampling of the topics include questions surrounding biomarkers of symptoms, study designs for testing symptom management strategies, technologies to deliver affordable health-promoting interventions across populations and settings, and development of new models for community-based PC. All of the questions will inform assessment of the current NINR scientific efforts and the planning of future research initiatives.

**Priorities and Future Directions for Advancing Nursing Science**

In claiming the future of nursing science, the NINR’s research direction and new initiatives are defined in part by current and future health challenges and the innovative technologies that will help us meet the challenges. Together, these challenges and new technologies have helped identify priority areas, briefly outlined below, for advancing nursing research to meet existing and yet-to-be-defined health challenges.

**Biological systems and symptom science.** Understanding the underpinnings of biological systems and their impact on symptoms and conditions continues to be a promising area for nursing science. The “omics” sciences, including focal areas such as genomics, proteomics, metabolomics, and nutrigenomics, are changing health care and the nursing profession. The NINR has long recognized that both basic and applied research are essential to provide the basis for integrating “omics” science into practice. In addition, the use of genomic and other “omics” information and technology is no longer dependent on genetic and other specialists but has transitioned into nonspecialty health-care delivery (Genomic Nursing State of the Science Advisory Panel, 2013). Nurses, as the largest single group of healthcare professionals, are ideally positioned to generate the knowledge and facilitate the translation of “omics”-related knowledge into health care. Expanding the capacity of nurse scientists to conduct “omics” research will promote the application of research discoveries to benefit patients.

**Biobehavioral nursing science.** As part of its mission, the NINR works to enhance nursing science and health care by integrating biological and behavioral science to explore links between behavior and health. The NINR, as part of the broader NIH community, participates in trans-NIH initiatives through the NIH Office of Behavioral and Social Sciences Research (NIH, 2015a). Recent initiatives have focused on system science and health in the behavioral and social sciences, advancing interventions to improve medication adherence, behavioral interventions to address multiple chronic health conditions in primary care, understanding and promoting health literacy, and research on chronic overlapping pain conditions. “The Science of Behavior Change,” another trans-NIH effort, is a program that aims to improve understanding of behavior change across a broad range of health-related behaviors (NIH, 2015c). The program supports research that integrates basic science to implement mechanisms associated with behavior and the development of measures and techniques to support mechanistic approaches to behavioral change.

**Data science.** Understanding data science or “big data” methodologies and their application has the potential to advance understanding of human health and disease; however, a lack of appropriate tools, poor data accessibility, and insufficient training are impediments to rapid translation. For these reasons, data science has an important role in the future direction and research priorities for nursing science (NIH, 2015b). Along with the other NIH institutes and centers, the NINR contributes to the Big Data to Knowledge initiative, including the development of a massive open online data management system, curriculum development and training in data science, and open educational resources for sharing, annotating, and curating biomedical big data. The relevance of this area to nursing science is evident when considering topics such as privacy issues associated with electronic health records for research, applying big data approaches to obtain visual and real-time data for efficient use in interventions and tailored treatments, and working effectively as part of multidisciplinary research teams. As noted earlier, the NINR’s most recent Symptoms Methodologies Boot Camp focused on big data in symptom science, highlighting the Institute’s dedication to equip nurses with the informatics tools necessary for transforming health care.

One such tool, common data elements (CDEs), through their ability to consolidate multiple smaller data sets, is a potential solution to the problem of proper analysis of small sample sizes in individual studies. Combined data from several similar studies may increase the impact of the findings or expand the population to which findings may be generalized. Also, the sharing of standardized measures will further capitalize on the benefits of big data to enhance its scientific benefit (Cohen, Thompson, Yates, Zimmerman, & Pullen, 2015). Directors of NINR-funded centers are now working with the NINR to identify CDEs for symptom science and self-management research, and the NINR is working with the scientific community to further develop CDEs.
Innovative methodologies. Innovative methods for approaching research questions continue to be important to advancing nursing science. The NINR has issued funding announcements to study management and prevention of symptoms in chronic illness through innovative methods that include sequential multiple assignment randomization trials (SMARTs) and multiphase optimization strategies. SMARTs allow re-evaluation of treatment options based on an individual’s progress toward treatment goals, while multiphase optimization strategies identify the most effective interventions through an iterative process of empirical research and discovery. Pragmatic trials are another innovative method well suited for nursing science’s clinical focus. The NINR is part of the NIH Health Care System Collaboratory (NIH, 2014), which is a trans-NIH effort supporting large-scale and cost-effective clinical research on multiple chronic conditions in settings such as health maintenance organizations that serve large patient populations. As part of this effort, the NINR is partnering with the National Institute on Aging, to manage the Pragmatic Trial of Video Education in Nursing Homes (PROVEN) that is evaluating video education as a tool for patients, families, and healthcare teams in making decisions regarding advanced care planning in nursing homes.

Translation of effective and sustainable interventions. As new knowledge is generated and effective interventions are developed through nursing science, new avenues for implementation, dissemination, and sustainability must also be considered. The NINR-funded Palliative Care Research Cooperative (PCRC; NINR, 2014) provides an infrastructure and center for PC research and is one example of the Institute’s efforts to advance intervention, dissemination, and implementation. The PCRC conducts and translates studies of effective ways to minimize suffering and improve the quality of life for those with advanced and potentially life-threatening conditions (Palliative Care Research Cooperative Group, n.d.).

Nurse scientists also continue to work with the Clinical and Translational Science Awards community (Sampselle, Knafl, Jacob, & McCloskey, 2013) as it develops partnerships for enhancing community-based models of care and facilitates translation of basic and clinical research into clinical care research. The NINR is also a member of the trans-NIH Dissemination and Implementation Committee that plans an annual training institute (Training Institute for Dissemination and Implementation Research in Health, 2014) and research conference (AcademyHealth, 2014). The NIH and other federal agencies will continue to sponsor initiatives to encourage the translation of interventions from the research setting to clinical practices and communities for sustainable use.

Investing in nurse scientist training. To continue to support advancements in science and improvements in health, research training and career development must be emphasized to cultivate the next generation of nurse scientists at all stages of their careers. A recent Council for the Advancement of Nursing Science (CANS) Idea Festival (IF) generated important recommendations for nursing science education (Henly et al., 2015a, 2015b) that should be incorporated into research-focused doctoral programs. NINR supports the CANS IF recommendations and the premise that research training programs must stay in step with the global healthcare environment (Grady, 2015a).

NINR and NIH programs and initiatives are contributing to the growth and development of exceptional nursing scientists. This includes an improved understanding of the determinants of health that make interdisciplinary and transinstitutional approaches necessary for nurse investigators. The NINR utilizes a variety of training programs to support nurse scientists throughout their careers and to encourage earlier entry of nurses into research training programs, including trainees from underrepresented backgrounds or in the early stages of their research careers. Training mechanisms include individual and institutional pre- and post-doctoral fellowships, as well as career development awards for junior and mid-career investigators. Continued emphasis on training and education serves to increase the research intensity and capacity of current and future nurse scientists and the entire nursing profession enterprise.

In the coming decades, the NINR will continue to evolve in supporting scientific research, moving forward to face new health challenges and needs as they develop. Emerging needs and opportunities go hand in hand. Thus, the goal for next 30 years of the NINR is to identify proactive, innovative solutions to these challenges, which will allow the NINR to continue to advance cutting-edge science to improve the health of the nation.
- Palliative Care Research Cooperative Group: http://palliativecareresearch.org/
- Palliative Care: Conversations Matter® (NINR): www.ninr.nih.gov/newsandinformation/conversationsmatter/

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