Advancing the Science of Nursing

Research & Scholarship

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UNIVERSITY OF MARYLAND
SCHOOL OF NURSING
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Nurses impact people's lives every day in innumerable ways. As a practice profession, nursing relies on a continually evolving body of scientific knowledge to help individuals, families, and communities stay healthy and manage chronic illness and disease. Critical and relevant research that addresses the nation's pressing health problems through developing interventions and systems to improve health outcomes is the cornerstone of effective and innovative nursing education and practice. To this end, the University of Maryland School of Nursing boasts a strong research program that is shaped by a community of scholars dedicated to advancing the knowledge base for nursing education and practice and to making an impact on critical health and health care issues.
Nurses do very little research simply for knowledge sake. As the profiles on the pages that follow illustrate, nursing science concentrates on major health priorities and the development of systems and interventions that improve health outcomes. As the need for more evidence to substantiate nursing practice and education grows, the critical research being conducted by the School of Nursing faculty will no doubt play an increasingly important role in creating pioneering education and practice models that will help shape the future and enhance the quality of care.

Capitalizing on the scientific depth and expertise of our faculty, the School identifies and targets areas of greatest need—including Environmental and Occupational Health; Cancer Prevention and Symptom Management; Behavioral and Community Health; Cardiovascular Health; Gerontology/Aging; and Health Policy—and, with the support of our Office of Research, provides the infrastructure to facilitate the research and build collaborations with other health professionals. These research "centers of excellence" provide the framework for the scientific exploration of key health care issues on the nation’s agenda, and also play an important role in our recruitment of senior faculty and students pursuing advanced degrees.

Scholarship is central to the School of Nursing's mission. To prepare nurses as leaders, we must develop innovative models of teaching and practice that support scholarship and stimulate student interest in scholarly research. The School of Nursing, which garnered $4.3 million in funded research in FY '03, is a fertile training ground for mentoring opportunities for doctoral students as well as synergistic collaborations among researchers on this campus and beyond.

Nurses can be proud of their role in making a difference in the lives of individuals and families. In today’s climate of uncertainty, the contributions of our faculty and graduate students toward improving public health cannot be overstated. Through research that addresses such critical issues as reducing health disparities in vulnerable populations and improving access to care, our researchers are providing a vital link between nursing scholarship and the development of meaningful interventions and systems to promote and maintain health and reduce risk and disability.

Janet D. Allan
PhD, RN, CS, FAAN • Dean and Professor
The School of Nursing has earned its reputation as a premiere research institution by cultivating and expanding a comprehensive, multidisciplinary research program. The Office of Research plays a central role in facilitating the School’s research agenda by providing the resources needed to support our distinguished faculty in their scholarly pursuits. The office ensures quality and technical excellence in all grant proposals, allowing investigators to devote more time to developing the science of their grants.

The School has set a strategic vision that includes developing centers of excellence, which provide the framework for conducting timely and relevant research in today’s health care environment. The Office of Research, established in 1999 and recently restructured, has advanced the School’s research posture by providing a valuable infrastructure for supporting faculty in their pursuit of funded research. The office provides assistance to nurse-scientists in the most critical stages of grant preparation, encourages collaboration with colleagues throughout the University campus, and provides expert review and mentorship to both novice and established researchers. Last year, extramural funding at the School totaled $8,268,200.

By promoting and sustaining the research efforts of our faculty, the Office of Research is helping to create a community of science that breeds innovation and excellence in nursing research, education and practice. Through these efforts, we will continue to expand the quality and influence of the School’s research portfolio, while seeking solutions to some of the nation’s most important public health challenges.

Barbara A. Smith
PhD, RN, FACSM, FAAN
Associate Dean for Research
Occupational, Community, and Environmental Health Research

The School of Nursing is culling the expertise of senior researchers in occupational and community health to expand its research agenda in health care worker safety to better understand the complex issues that contribute to adverse affects on the physical and psychological well-being of health care employees. In addition, in response to increased concern among citizens about environmental health hazards and risks in their communities, the School is leading innovative education and outreach initiatives that integrate environmental health perspectives into health care delivery and identify opportunities for multidisciplinary collaboration between environmentalists and health care communities.
Having recently completed a three-year study of the effectiveness of the Occupational Safety and Health Administration (OSHA) violence prevention guidelines within the mental health industry, Jane Lipscomb, PhD, RN, FAAN, associate professor, is expanding her research to include violence prevention in both the social service and home health work environments. For the former, she is the principal investigator of a five-year, $2,506,354 grant funded by the Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (CDC/NIOSH) that involves a comprehensive assessment of risk factors for and occurrences of violence in a sample of New York social service workplaces.
The program will once again be developed in concert with federal OSHA guidelines and will lead to the development and implementation of an intervention for violence prevention in these workplaces. Lipscomb is collaborating on the study with School of Nursing colleagues Jeanne Geiger-Brown, PhD, RN; Kate McPhaul, MPH, RN; Carles Muntaner, MD, PhD; Jeffrey Johnson, PhD, and Karen Soeken, PhD.

According to Lipscomb, workplace violence is pervasive in the social service and health care settings. In Washington state, workers' compensation assault injury data for 1995-2000 ranks social services as the highest risk industry, with health services ranking second.

"In the mental health industry study, we evaluated the impact of the implementation of the OSHA guidelines and found a demonstrated reduction in risk factors for violence, as well as a reduction in the actual physical assaults in the facilities that received the intervention," explains Lipscomb. "We hope to replicate those results in the study on social service workers."

Lipscomb is leading a related study on workplace violence risk in home health care. The $222,750 investigation, also funded by CDC/NIOSH, will measure and evaluate risk factors for assault in the home health environment. The risks faced by home health care workers are in many ways a function of the organization of work, according to Lipscomb. The unpredictability, lack of control over the physical work environment, and differing social roles of caregiver and client when in the home put home health workers at increased risk of assault-related injury. The project will develop measures for risk factors, threats and assaults, and current violence prevention strategies in home health and their coherence with OSHA's violence prevention guidelines for home health care. Doctoral candidate Kate McPhaul, MPH, RN, is co-principal investigator on the grant. This work is the topic of her doctoral dissertation.

Lipscomb is also working with her colleagues at the School of Nursing on a study of work organization and health among home health care workers, as well as a project looking at extended work schedules and workplace injury in nurses.

"Organization of work is the umbrella concept upon which all of us build our research," says Lipscomb. "These initiatives provide us with important information regarding occupational hazards in the health care sector and strategies that will lead to the prevention of adverse health outcomes among health care workers."
Professor Carles Muntaner, MD, PhD, is a social epidemiologist in the areas of work organization, social class, and mental health. He is currently the principal investigator on a National Institute of Mental Health study examining the relationship between social inequalities and mental health at different levels of aggregation. Muntaner is conducting a population-based analysis in Baltimore neighborhoods to examine the association between residential socioeconomic context and the prevalence of depression and anxiety disorders in the United States. In addition to income inequality, the study also investigates the relationship between alternative socioeconomic context indicators such as absolute income, poverty, and social capital and psychiatric disorders. "Socioeconomic position is a key determinant of mental health," says Muntaner. "Depression and anxiety disorders inflict major social and economic burden not only on at-risk individuals and families, but entire communities, although welfare state and redistributive social policies go a long way to improve this problem," he adds.
Muntaner is also looking at social capital, particularly an individual's attachment to his or her community, and its impact on individual well-being. He has found that neighborhood ties do not necessarily have a positive impact on health. In low-income neighborhoods, parents who knew their neighbors well reported the presence of behavioral problems in their preschool children. However, the opposite was true in wealthy neighborhoods. “This counters the argument that connections to a community are always good for your health,” says Muntaner. “Further study is needed to learn more about community inequalities in mental health among children.”

In the area of occupational health, he is continuing his examination of work organization as an important determinant of the psychological and physical well-being of nurse assistants and home health care workers. As principal investigator of a $780,000, three-year grant from the Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health, Muntaner, in collaboration with School of Nursing colleagues Drs. Jeanne Geiger-Brown, Jane Lipscomb, and Alison Trinkoff, is evaluating adverse work organization factors, such as low wages, physical and emotional demands, and violence and their relation to depression and musculoskeletal disorders (MSDs) among home care workers. Results of the study will have implications for workplace policies in home health care agencies, with the goal of reducing depression and MSDs, as well as other psychological and physical impairments that contribute to worker turnover.

“Because of these work conditions, nurse aides are not able to provide the attention they believe their clients deserve, nor can they provide the quality of care needed,” explains Muntaner. “They have no autonomy, they feel the emotional toll, and this leads to depression.”

Muntaner's research in occupational health addresses the importance of the emotional and psychological demands of health care, and also focuses on the characteristics of work organization. He has found in related research, for instance, that workers in for-profit nursing homes have higher symptoms of depression than their counterparts working in nonprofit organizations.

“This would indicate an association between management style in for-profit nursing homes and worker depression,” says Muntaner, adding that health care workers in non-standard working arrangements, such as contract, temporary, or on-call, also have higher rates of reporting poor health.

“There is a divide among health care workers in standard and non-standard working arrangements, and the latter are clearly more exposed to workplace hazards leading to poor health.”

Depression and anxiety disorders inflict major social and economic burden not only on at-risk individuals and families, but entire communities.
Keith O. Plowden, PhD, RN, Assistant Professor

Examining Social Factors That Impact Health Behaviors Among African American Men

Keith O. Plowden, PhD, RN, assistant professor and vice chair, Department of Organizational Systems and Adult Health, is leading several research programs that examine the social factors that affect health behaviors, particularly among African American men. Much of his work focuses on HIV and cancer prevention, including a recent three-year, $400,000 grant from the Department of Defense that involves developing a faith-based prostate cancer prevention outreach program in Baltimore City. Building on his earlier research, Plowden is developing an intervention centered around communities of care by training church leaders and prostate cancer survivors as peer outreach workers to promote prostate cancer screening among urban African American males.
The study will examine the effect of the peer-led prostate cancer intervention and its effectiveness in building cancer knowledge and increasing cancer screening behavior among this population.

"Caring is an important component of health seeking behaviors," says Plowden, adding that preliminary data shows that faith leaders and peers are strong motivators for African American men. "You have to get the community involved. The key is having someone who really cares about you delivering the message."

In a separate study, Plowden is exploring factors that influence substance abuse and other HIV high-risk behavior among minority men. Partnering with the Black Educational AIDS Project, he is developing a comprehensive prevention project targeted at substance-abusing black men who have sex with men. The overall goal of the $120,000 study, which is being funded by the Substance Abuse and Mental Health Services Administration, is to create the infrastructure needed to build a sustainable prevention program that promotes consensus and awareness building and that address the health disparities in this population.

"By creating and facilitating community coalitions, we can develop effective strategies for the integration of HIV and substance abuse prevention interventions for at-risk minority men," says Plowden.
Barbara Sattler, DrPH, RN, FAAN, associate professor, is leading a team of investigators at the School of Nursing in projects designed to build environmental leadership within the nursing community and to identify opportunities to enhance the role of nurses as practitioners and advocates for environmental health. As director of the Environmental Health Education Center (EHEC), she is responsible for spearheading initiatives that promote community-based projects, training/education, and research in environmental health. The Center provides national leadership in building environmental health capacity in the nursing community by partnering with governmental agencies, other health professionals, and advocacy organizations to address environmental health challenges.
With a new grant from the Beldon Fund, a New York-based foundation, Sattler and her colleagues aim to move environmental health and nursing to the next level, and to advance the role of nurses as effective advocates for environmental health by identifying the “common ground” between the nursing community and the traditional environmentalist community and developing enhanced partnerships and strategies for national and state-level efforts.

“By working within the nursing community, we hope to foster nursing leadership, create a national vision, and develop a new voice for health environments to promulgate intelligent public health-oriented policies,” says Sattler.

The EHEC addresses environmental health challenges such as air quality, childhood asthma, pesticide use in schools and communities, and contaminated waste sites that may pose health risks to communities. These projects are supported by the Environmental Protection Agency, the National Institutes of Environmental Health Science, and other federal, state, and local sources.

With School of Nursing colleagues Debra Spunt and Brenda Afzal, Sattler is also involved in a project designed to improve environmental and occupational health at the School and to create a model for other schools of nursing to adopt.

“We must be self-critical and become more internally consistent,” Sattler says, pointing to the elimination of mercury-containing thermometers in the School as an important first step. “The mercury from one thermometer could contaminate a 25-acre lake, making the fish in it unsafe to eat. Additionally, we are always digging deeper to help reduce the carcinogen load in health care and other settings as well, by promoting the selection of environmentally safer cleaning agents, pest control methods, and other products and processes.”

Sattler and her colleagues are also actively engaged with Health Care Without Harm, an international coalition of hospitals, health care systems, health professionals, community groups, and environmental health organizations, who are promoting environmentally healthy and safe health care systems.

According to Sattler, “The work we do must be rigorously science-based. Nurses are one of the most trusted sources of information regarding environmental health. We must honor this covenant of trust by ensuring that we inform from a knowledge base, using our understanding of human health, pathology, and environmental sciences to promote health and environmental protection through our educational endeavors, in our practice settings, with our research, and in our advocacy work.”
For nearly a decade, Professor Alison Trinkoff, ScD, RN, FAAN, has studied working conditions for nurses and the relationship between work demands and physical injuries. As principal investigator of a new $1 million grant from the Centers for Disease Control and Prevention, National Institute of Occupational Safety and Health (CDC/NIOSH), Trinkoff is continuing her research, looking at extended work schedules and workplace injury in nurses. Her longitudinal study of more than 2,600 registered nurses will examine the relationship of long work hours and overtime to needle stick injuries and musculoskeletal disorders (MSDs) of the neck, shoulder, and back.
A recently completed study of 1,428 nurses revealed a positive correlation between the physical demands of nursing, as well as work schedule and changes in the workplace, including staffing decreases and increased patient acuity and workload, and MSDs. “We’re finding that each of these components is associated with the injury,” she explains.

Using a 12-item scale, Trinkoff and School of Nursing colleagues rated the physically exerting activities performed by nurses, including forceful movements, awkward postures (bending and twisting) and heavy lifting, and their association with MSDs. They found that nurses with moderate and high perceived physical demands were significantly more likely to report neck, shoulder, and back problems. In related studies, Trinkoff examined the impact of work organization on MSDs as well the functional consequences of MSDs in nurses. Findings from these studies suggested the need for system-level interventions, including modified scheduling for nurses, reduced exposure to demanding work conditions, and preventive strategies, such as mechanical devices and lifting teams, to reduce the odds of MSDs among nurses.

The goal of Trinkoff’s research is to better understand the cumulative effect of organizational work factors on health care worker safety, particularly in light of the current nursing workforce shortage. A report by the Institute of Medicine, Keeping Patients Safe: Transforming the Work Environment of Nurses, addresses these and related issues of “work design and organizational safety culture” in an effort to promote patient safety. The report contains findings from Trinkoff’s research that illuminate the impact of nursing conditions on patient care. In a $687,651 study funded by the Agency for Health Care Research and Quality, Trinkoff is examining the connection between health care organization work environments and patient and worker safety, thus forming the cornerstone for the next phase of her research.

“We have a good sense of the demands of nursing and how they are affecting their health,” says Trinkoff. “Now we need to look more closely at how the working conditions of nurses connect to the patient experience.”
Staffing shortages are acute and widespread among health care professionals and no less so among medical technologists and technicians. There are approximately 295,000 medical laboratory workers in the United States who are at risk for musculoskeletal and other disorders resulting from workplace demands. Jeanne Geiger-Brown, PhD, RN, assistant professor, is the principal investigator of a study on the effects of physical and psychological demands on the health of laboratory workers, an under-studied population of health care professionals. With a grant from the Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health, she is developing and testing the validity of self-report measures to assess work demands for medical technologists.

According to Geiger-Brown, medical technologists and technicians are at risk for a variety of back injuries and musculoskeletal disorders of the upper extremities because of repetitive motion. In addition to these physical impairments, psychological demands such as time pressure and devaluing, as well as health care changes that alter the organization of work, can have a cumulative negative impact on the health and well-being of lab workers.

“The overarching question in all occupational health studies is, ‘How does work make you sick?’” says Geiger-Brown, who is collaborating with School of Nursing colleagues Drs. Jane Lipscomb, Carles Muntaner, and Alison Trinkoff. “We need to find ways to make the work environment healthier.”
Interventions

Promoting or Restoring Health and Preventing Disease

Nurses play a central role in promoting health and preventing illness in people across their lifespan, and intervention is at the core of this endeavor. At the School of Nursing, researchers are investigating methods of intervention in cancer prevention, cardiovascular health, gerontology/aging, and HIV. Investigators are vigorously pursuing different areas of oncology research and making strides in early detection, prevention, and related cancer care issues. Research in cardiovascular health at the School highlights risk intervention, treatment, and rehabilitation for heart disease patients and those at risk for cardiovascular disease. Gerontological nurse scientists are pursuing research activities aimed at prolonging independence, good health, and quality of life for seniors, while other researchers are studying physical activity and nutrition in patients with HIV.
Over the last 20 years, Professor Deborah McGuire, PhD, RN, FAAN, has built a comprehensive research program centered on symptom assessment and management in cancer patients. In the area of supportive care, McGuire has conducted extensive research in cancer treatment-related pain; namely, the acute oral pain associated with oral mucositis, one of the most frequent and severe side effects of radiation and chemotherapy. Her earlier pilot studies involving bone marrow transplant and leukemia patients paved the way for subsequent intervention studies looking at ways to manage and improve the oral complications that arise from cancer treatment. Currently, McGuire is preparing a research grant looking at similar clinical problems in patients with head and neck cancer.
"This is an under-studied population for whom these complications are a real problem," says McGuire. "Oral mucositis and pain have a significant impact on the patient's quality of life and can even affect willingness to continue with potentially curative cancer treatment."

McGuire intends to look at the patterns and factors related to the incidence and severity of oral complications to develop targeted interventions that will help manage the painful side effects of treatment.

"This is an area that presents an enormous clinical challenge for patients, families, physicians, and nurses," says McGuire, adding that multi-therapy intervention packages must be developed to achieve effective symptom management.

In addition, McGuire is investigating how nurses and family members can assess and quantify pain in palliative care patients who cannot self-report for a variety of reasons. The study will incorporate the Multidimensional Objective Pain Assessment Tool (MOPAT), a pain assessment instrument tested by McGuire and colleagues in a previous study involving 30 non-communicative hospice patients. Although that study provided important data on the reliability, validity, and sensitivity of the MOPAT, it was tested only in the hospice setting. The new study will test the tool in different venues and with a variety of patients to determine its clinical feasibility.

"When patients are being cared for at home, family members need to know when certain behaviors indicate pain and what to do about it," said McGuire, who is collaborating on the study with School of Nursing colleague Karen Soeken, PhD, and others at the University of Maryland Medical System. "Once we teach family members how to use the tool, we can test its reliability and validity and determine whether it will be a helpful adjunct to home care."
According to Sandra McLeskey, PhD, RN, associate professor, a tumor’s ability to command new blood vessel formation, a process known as angiogenesis, may determine its ability to metastasize. Results from earlier cancer research using animal models have shown that inhibiting blood vessel formation can inhibit tumor growth and possibly result in shrinkage or destruction of the tumor. In an offshoot of her earlier research in gene expression in tumor-associated blood vessels, McLeskey is examining the role of molecules that dissolve blood clots to further explore the molecular mechanisms that play a role in tumor angiogenesis.
Results from earlier cancer research using animal models have shown that inhibiting blood vessel formation can inhibit tumor growth and possibly result in shrinkage or destruction of the tumor.

“Tumors have a lot of clots in the extracellular space around the tumor cells,” explains McLeskey, whose work is being supported by a grant from the U.S. Army Breast Cancer Program. “In order for a blood vessel to make a new sprout that will grow into a bigger vessel supplying the tumor, the sprout must invade the clot. Therefore, we are looking at the molecules in blood vessel cells that are important in the dissolving of clots.”

With pilot funding from the University of Maryland Greenebaum Cancer Center, McLeskey is conducting a separate study on tamoxifen resistance in breast cancer. Tamoxifen is a drug used to treat women with estrogen-receptor positive breast cancer. Using animal models, she will investigate the molecular differences between estrogen-stimulated tumors and tamoxifen-stimulated tumors to help identify both stromal and tumoral elements important in tamoxifen resistance.

“Right now, tamoxifen only works for about half of the women who have estrogen-receptor positive breast cancer,” says McLeskey. “Our goal with this study is to identify the molecules that play a role in tamoxifen resistance. Once we know more about how such resistance is produced, we can perhaps re-establish tamoxifen sensitivity.”
In studying the interaction of social, psychological, and physiological factors of cardiovascular health, Professor Erika Friedmann, PhD, has focused her research on the psychosocial dynamics of increased coronary artery disease survival. In one area, she has investigated the health impact of pet ownership as a predictor of survival of heart disease patients. Friedmann collected one-year survival data from a randomly selected group of patients who participated in a Cardiac Arrhythmia Suppression Trial (CAST) to further investigate the beneficial effects of pet ownership, independent of physiologic, demographic, and other psychosocial variables. “We found that people who owned pets did better than non-owners in one-year survival, independent of all other social support,” says Friedmann. “However, pets are not a replacement for social support.”
In separate investigations, Friedmann studied the role of pets in moderating the physiological stress response and found that the presence of a friendly dog moderated the stress response, particularly among those who perceived dogs most positively. Participants from the CAST psychosocial factors study were selected to participate in an investigation to determine the relation between pet ownership and heart rate variability (HRV) and to further examine the clinical predictors of survival between pet owners and non-owners. The HRV investigation found that differences in survival between pet owners and non-owners may be due, in part, to differences in cardiac autonomic modulation, as indicated by higher HRV among patients with pets. Ongoing research combines 24-hour blood pressure monitoring with examination of the stress-moderating influence of animal companions in the laboratory setting.

"The goal of these studies is to make a connection between laboratory data and epidemiological data, and to combine experiential research with more life-based, longitudinal situations," explains Friedmann.

Friedmann is also collaborating with School of Nursing colleague Sue Ann Thomas, PhD, RN, FAAN, on an investigation, funded by the National Institute of Nursing Research (NINR), of the impact of technology on the psychosocial status of heart disease patients, particularly those living with heart failure. Although implantable cardioverter-defibrillators (ICDs) have become a common treatment for lethal dysrhythmias, studies suggest a high incidence of depression in patients with ICDs.

"AEDs (automatic external defibrillators) are a constant reminder to the patient that he or she is sick and in danger of dying," says Friedmann, whose newest NINR-funded collaboration with Thomas examines the psychological responses of family members who receive training to use home AED's as an alternative to ICDs for patients who are at lower risk of sudden cardiac death.

Friedmann is also involved in ongoing research that focuses on the content of doctor-patient communication involving older patients in the primary care setting. She is a member of a team that developed an analytic system for examining the process of communication as well as the specific content of the interaction. This method, the Multi-Dimensional Interaction Analysis (MDIA), aided in the analysis of physician and patient talk as recorded in audiotapes, which are coded by members of the research team. The MDIA enables coders to assess the content, process, language, and behavior of physicians and patients during their medical primary care visits. It has been used to examine differences in medical encounters with older and younger patients and in men and women. The MDIA is currently being used to study the development of the physician-patient relationship as well as subjects discussed within the medical encounter.

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Assistant Professor Karen Johnson, PhD, RN, CCRN, is conducting several investigations involving the physiologic stress response in acute and chronic conditions. In a pilot study, she is comparing the physiologic stress response, as indicated by the release of stress hormones and cortisol, in depressed and non-depressed individuals, using nursing school undergraduates as her research subjects. The study measures catecholamine and cortisol levels, as well as psychological factors to determine if depressed individuals respond differently to acute stress situations.
"I believe they do," says Johnson, who also hypothesizes that depressed people stay in an elevated stress state for longer than non-depressed individuals.

The goal of the study, according to Johnson, is to determine if this elevated state of anxiety, as measured by neurohormonal secretion, is the physiologic link between depression and cardiovascular disease.

"The relationship between depression and stress remains largely unexplored," she explains. "Further examination of this relationship may determine what physiologically links these conditions in the development of heart disease."

Johnson is also researching acute stress situations in trauma/critical care patients, and specifically whether noise reduction and music therapy in the intensive care unit decrease levels of anxiety. The study compares the biopsychosocial effect of music therapy and noise reduction on the level of stress hormone in these patients.

"Patients tell us that music decreases their anxiety, but the true measurement will be whether it simultaneously reduces both psychological and physiological stress indicators," says Johnson. "Ultimately, the goal is to determine how we can create a more caring situation in what is typically a very high-tech, noisy environment."

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Sudden cardiac death results in 300,000 deaths annually and is the leading cause of death among adults in the United States. In her ongoing research in cardiovascular health, Sue Ann Thomas, PhD, RN, FAAN, professor and assistant dean for doctoral studies, is investigating the psychological response of cardiac patients and their significant others who receive training in responding to sudden cardiac arrest (SCA). As part of a four-year, $1.2 million study funded by the National Institute of Nursing Research (NINR), National Institutes of Health (NIH), Thomas will compare the psychological outcomes of standard lay training in CPR to standard training plus the use of a home automatic external defibrillator (AED). The study will cull 440 patient-spouse/companion pairs currently enrolled in an NIH-sponsored Home Automated Defibrillator Trial.

Enhancing Treatment and Psychosocial Outcomes for Cardiac Patients

Sue Ann Thomas, PhD, RN, FAAN, Professor
"The use of defibrillators in general by lay people is groundbreaking," says Thomas. "Now we are looking at the impact of sending these defibrillators home with the patient."

According to Thomas, earlier studies indicate that training family members in CPR increases anxiety and depression in both patient and family member. Her study is the first to examine the long-term psychological responses for post-myocardial infarction patients and their spouses/companions to SCA training.

"We're hoping we can change the pattern of stress by talking to the patient and performing the right kinds of in-services," explains Thomas, who is also conducting a separate NINR-funded study on the psychosocial factors in sudden cardiac death. In both projects, she is collaborating with colleague Erika Friedmann, PhD, to analyze factors such as depression, stress, anxiety, social support, and pet ownership on patient outcomes.

Cardiovascular Health

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For nearly a decade, Assistant Professor Christopher Ward, PhD, has studied the role of calcium handling in normal and diseased striated muscle and, more specifically, the molecular determinants of these calcium-handling processes.
"The myoplasmic regulation of calcium is important for cell contraction, gene expression, and cell death," explains Ward. "Further understanding of the basic processes by which calcium is regulated within the cell could be valuable to our understanding of normal muscle function, muscle adaptation, or dysfunction due to specific disease processes."

In addition to his laboratory research program at the School of Nursing, Ward is a faculty member of the Interdisciplinary Training Program in Muscle Biology at the University of Maryland, Baltimore (UMB). This training program, funded by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), National Institutes of Health, and directed by Martin F. Schneider, PhD, professor of biochemistry and molecular biology at the School of Medicine, provides training ranging from the molecular biological determinants of muscle development to molecular aspects of structure and function of muscle proteins.

Ward's involvement in this interdisciplinary training program has enhanced his efforts as principal investigator of a five-year, $646,650 NIAMS grant in which he is examining the local regulation of calcium release from intercellular calcium storage organelles—the sarcoplasmic reticulum.

Ward's efforts to better understand this basic release mechanism are bolstered by collaborative efforts on the UMB campus, regionally, nationally, and internationally. These projects are investigating the role of calcium signaling in such disorders as muscular dystrophy, malignant hypothermia, and central core disease. Ward hopes to use his research findings in the cellular physiology of striated muscle to advance the knowledge of muscle in an integrated whole-body system and to better understand how alterations in the myoplasmic regulation of calcium contribute to many disease processes.
Developing Interventions to Promote Healthy Aging

Associate Professor Barbara M. Resnick, PhD, RN, CRNP, FAAN, FAANP, has devoted much of her career to building a comprehensive research program that focuses on ways to motivate older adults to engage in functional activities and exercise and thereby improve overall health and quality of life. Currently, she is leading a variety of studies focusing on health promotion activities for older adults. As principal investigator of a $1.9 million grant from the National Institute on Aging, National Institutes of Health, Resnick tested the motivational component of an exercise program she developed for hip fracture patients.
The Exercise Plus Program, a home-delivered intervention designed to increase exercise behavior in older women recovering from hip fracture surgery, integrates visits by an exercise trainer with motivational interventions to enhance self-efficacy, increase exercise behavior, and improve outcomes.

According to Resnick, hip fracture recovery is facilitated by patient participation in regular exercise, but clinicians often face barriers in motivating older adults to initiate and adhere to such exercise programs. Resnick’s research is largely founded on the restorative care philosophy, which focuses on restoring and maintaining physical function in older adults by motivating them to perform self-care activities.

To this end, Resnick is leading a $2.3 million study funded by the Agency for Healthcare Research and Quality that will test the effectiveness of a restorative care program in long-term care. The goal of the study is to implement a two-tiered restorative care program, the Res-Care Intervention, which incorporates self-efficacy-based interventions for both nursing assistants and residents to improve functional performance, prevent contractures, and improve mood. The study will also examine the effectiveness of restorative care programs and provide a realistic model of integration of restorative care in the nursing home.

“Ultimately, the goal is to change the philosophy of care in long-term care from one in which nurses provide care that creates dependency, to one that focuses on the restoration and/or maintenance of physical function,” says Resnick, who, also works as a geriatric nurse practitioner at Roland Park Place, a continuing care retirement community in Baltimore.

Resnick’s impact on research was recognized when she was honored as Research Lecturer of the Year by University of Maryland, Baltimore, during its annual Founder’s Week in October 2003. She was the first nurse and first representative from the School of Nursing to achieve this prestigious campuswide honor.
Professor Barbara A. Smith, PhD, RN, FACSM, FAAN, associate dean for research, has spent much of her career studying the effects of exercise as an intervention for various patient populations. For many years, her research focused on the effects of aerobic exercise on cardiac patients. She later expanded her work to include other at-risk populations, including patients with diabetes, breast cancer, HIV, Parkinson’s disease, and other illnesses.
Smith is currently the principal investigator of a $1.4 million, four-year grant from the National Institute of Nursing Research (NINR), which looks at physical activity and nutrition in patients with HIV. The study examines the effects of a 16-week integrated intervention designed to improve body composition, blood lipids, and metabolic variables in HIV-infected individuals who are enrolled in National Institutes of Health-funded clinical trials of highly active antiretroviral therapy (HAART).

"Earlier, we investigated the safety and efficacy of exercise in the HIV population," explains Smith. "Now, we are looking at the role of physical activity and nutrition in the prevention of high cholesterol, type II diabetes and other illnesses that put people at a higher risk for heart disease."

The intervention, which is intended to improve lipodystrophy or fat redistribution, a common side effect of antiretroviral therapy, consists of physical activities designed to improve cardiorespiratory endurance and enhance strength and flexibility, and also includes a nutrition component. Smith is also directing a similar investigation that focuses on bone health in HIV patients.

In a separate $300,000 study funded by NINR and the National Institute of Allergy and Infectious Diseases, Smith has evaluated the effect of aerobic exercise on depression management in adults with HIV. Depressive symptoms, according to Smith and her research colleagues Judith Neidig, PhD, of The Ohio State University College of Medicine and Public Health, and Dale Brashers, PhD, of the University of Illinois, are not often treated in the HIV population, even though they are a common side effect of HIV drug therapy. In this study, participants who completed a 12-week aerobic exercise training program reported improvements in depressive symptoms. The study, thought to be the first of its kind, presents evidence that moderately intense aerobic exercise may be an effective tool for the prevention or reduction of symptoms of depression in the adult HIV population.

Smith is also conducting an industry-funded study (Savent Pharmaceuticals) examining the effects of an aerobic/resistive exercise program with and without Oxandrolone on lean mass and body fat distribution in HIV-infected individuals. The study is intended to evaluate the consequences of HAART, including the use of Oxandrolone, on HIV-infected adults.
Associate Professor Catherine Kelleher, ScD, MPH, RN, is leading a $2,492,809 study funded by the Agency for Healthcare Research and Quality, which will examine the impact of expanding the role of traditional home health aides on home health care cost, re-hospitalization, emergency room use, and patient and job satisfaction. The four-year study will test a new home health care delivery model featuring home health aides functioning in enhanced roles as disease management coaches for patients with congestive heart failure and diabetes.
The goal is to produce better patient outcomes and at the same time greater job satisfaction for the home health aide disease management coaches, thereby reducing job turnover and making more efficient and effective use of home health aides and RNs, both of which are in short supply,” explains Kelleher.

The 48-month randomized intervention trial will teach home health aides to function as disease management coaches using a new curriculum that incorporates courses used to train community health workers and that focuses on the management of diabetes and congestive heart failure. The training curriculum is designed to improve the ability of home health aides to communicate with their clients, increase their comfort level in answering questions, and promote and encourage patient disease management strategies.

“We are trying to adapt educational and supervision techniques used for community health workers to home health aides,” says Kelleher, adding that the training will provide the home health aides with a deeper understanding of their clients’ diseases and a greater appreciation for the underlying principles of specific nursing interventions.

Kelleher is collaborating on the study with University of Maryland faculty and staff in the Schools of Nursing, Pharmacy, and Medicine, as well as faculty from The Johns Hopkins University Bloomberg School of Public Health and School of Nursing, and MedStar Health Visiting Nurses Association.

“There are many implications for testing this model nationally and incorporating it into everyday use,” says Kelleher, who also coordinates the School of Nursing’s master’s track in nursing health policy. “By using home health aides as disease management coaches, home health agencies can provide quality health care more efficiently under the prospective payment reimbursement system.”

In addition to her role at the School of Nursing, Kelleher serves as an affiliate of the Center for Research on Aging at the University of Maryland School of Medicine and as an affiliate of the Interdisciplinary Gerontology PhD Program of the University of Maryland Graduate School and University of Maryland Baltimore County.
With funding from a National League for Nursing (NLN)/Laerdal Simulation Study research grant, Debra Spunt, MS, RN, director of the School of Nursing’s clinical simulation laboratories, is leading a study to document the importance of simulation learning. Because students working in simulation labs develop keen clinical skills—a pedagogical approach the NLN has recognized and now wants to reinforce with empirical research—the School was awarded a $12,000 research grant, part of a larger $375,000 grant given to eight different schools nationwide to document the importance of simulated learning.

The purpose of the study is four-fold:
1) to develop and test models that nursing faculty can implement when using simulation to promote student learning;
2) to develop a cadre of nursing faculty who can use simulation in innovative ways to enhance student learning;
3) to contribute to the refinement of the body of knowledge related to the use of simulation in nursing education; and
4) to demonstrate the value of collaboration between the corporate and non-profit worlds.

“This is a multi-site grant to define, document, and collect data about simulated learning and the transfer of skills to real life,” says Spunt. “It’s a matter of people knowing from experience that simulated learning works, and now the NLN wants to support the anecdotal evidence with research.”

The School is one of only eight sites in the nation selected for participation in the NLN/Laerdal-sponsored grant to identify the underlying constraints of simulation learning and to develop clinical assessments for research in simulation.
Doctoral student Mona Choi, MN, RN, is introducing Geographic Information Systems (GIS) as a tool to assess the high-risk visits of home care workers. According to Healthy People 2010, a nationwide health promotion and disease prevention agenda, GIS is “a powerful tool combining geography, data, and computer mapping.” However, although GIS has been used to map population-based data to support public health, it has not been used to assess the risk of assault against home visiting health care providers.

Choi, whose research interest is a crossover between informatics and public health, will conduct a pilot study to examine the correlation between survey respondents’ perceptions of high-risk visits and the sociodemographic characteristics of the areas they are visiting. The study will also determine if GIS simulation can predict high-risk home visits.

“GIS can analyze and visualize this data to provide a better understanding of whether sociodemographic characteristics of a visiting area are associated with self-reported high-risk visits and whether these areas present any risk or potential for assault on home health care workers,” says Choi.

In an industry that, according to the Bureau of Labor Statistics, is expected to grow to 1.25 million by 2005, the development of a GIS technology tool that incorporates decision support systems to identify high-risk home visits, will significantly affect efforts to improve home health care workers’ safety.
As an emergency room psychiatric nurse practitioner, first-year doctoral student Janet Passley-Harp, MS, RN, PMHNP, has seen numerous victims of domestic violence. As a result of these experiences, she is interested in studying domestic violence, particularly intimate partner violence, in an ethnic population.

"Violence has different meanings across cultures," says Passley-Harp. "I am interested in using or developing a tool that reflects the unique experiences of an ethnic community toward domestic violence and determining if existing approaches within that particular community actually work."

In addition, because there is a dearth of nursing studies on intimate partner violence from the perpetrator’s perspective, Passley-Harp plans to delve into the problem by examining the challenges, motivations, and characteristics of the perpetrator. Specifically, she will investigate how depression and substance abuse are linked to perpetrator violence, while also examining how clinicians interface with perpetrators to facilitate the effectiveness of interventions and maximization of resources.

"Ultimately, my goal is to develop a tool that can be used across clinical and hospital settings to assist nurses in identifying perpetrator violence and in providing these individuals with informed choices."
Clinical pathways is an effective tool for orchestrating patient care by bringing together clinical, therapeutic, and diagnostic information. Doctoral candidate Kenneth Rempher, MS, RN, MBA, CCRN, ACNP-CS, is investigating the effect of clinical pathways on the fiscal, functional, and physiological outcomes for patients diagnosed with heart failure.

"We’re looking at outcomes in patients whose care has been driven by the clinical pathway," explains Rempher, an advanced practice nurse in cardiology/cardiac surgery and interventional radiology at Sinai Hospital in Baltimore. "We’re studying variables and trying to isolate the pathway as the primary intervention affecting these outcomes to help patients meet their goals in an acceptable time period."

Rempher has developed a pathway model at Sinai Hospital that incorporates physiological outcomes resulting from various nursing interventions.

"Nurses can see the patient’s physiological response to care, allowing them to alter their treatment plan so that it is consistent with the patient’s needs," says Rempher, who hopes his dissertation will further explain the value of and legitimize the use of clinical pathways.

"Studies like this will increase compliance and add to the base of knowledge concerning clinical pathways, making them scientifically sound tools, not just primitive task lists."

Kenneth Rempher, MS, RN, MBA, CCRN, ACNP-CS, Doctoral Student

Investigating the Effects of Clinical Pathways

Rempher says that more than $10 billion is spent annually on care for Medicare/Medicaid patients diagnosed with heart failure. He believes that nurses who use the pathway can improve health care outcomes by decreasing the length of hospital stays and reducing hospital readmissions.
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COVINGTON, BARBARA, PhD, RN


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DOREH, BARBARA, MSN, RN


F

FAHE, VANESSA, P., PhD, RN


FEROLI, KATHLEEN, MS, RN


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McGUIRE, DEBORAH, PhD, RN, FAAN


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NAHM, EUN-SHIM, PHD, RN


O'NEIL, CAROL, PhD, RN, FAAN


OROS, MARIA T., MS, RN


P

PICOFT, SANDRA, PhD, RN, FAAN


PLOWDEN, KEITH, PHD, RN


V

VASQUEZ, ELIAS, PHD, NNP, PNP, FAAN


W

WALTZ, CAROLYN F., PhD, RN, FAAN


WARD, CHRISTOPHER, PhD


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The School of Nursing’s Clinical Research Review Committee was established to review grant proposals prior to submission to the University of Maryland, Baltimore’s Institutional Review Board (IRB). Led by Associate Dean for Research Barbara Smith, PhD, RN, FAAN, the committee consists of two subcommittees of research faculty. Each group meets monthly to evaluate proposals to ensure that they meet the minimum IRB requirements regarding study subject safety.

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CONTRIBUTORS

The University of Maryland School of Nursing, Office of Communications, publishes Advancing the Science of Nursing: Research and Scholarship biennially. We welcome your comments, which can be e-mailed to padams@son.umd.edu.

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Contributors

Joe Rubino
Photography (except where otherwise noted)

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The Art Litho Co.
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Founded in 1889, the University of Maryland School of Nursing is one of the leading research institutions in the nation. Consistently ranked among the top 10 schools of nursing in the nation by U.S. News & World Report, the School enrolls over 1,400 students in its baccalaureate, master’s, doctoral and continuing education programs. The School emphasizes the integration of research, teaching and clinical practice, and serves regional, national and international audiences.