



NATIONAL INSTITUTE OF NURSING RESEARCH

**Current
Research
Perspectives
1996-2001**

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MISSION STATEMENT

The National Institute of Nursing Research supports clinical and basic research to establish a scientific basis for the care of individuals across the life span—from management of patients during illness and recovery to the reduction of risks for disease and disability, the promotion of healthy lifestyles, promoting quality of life in those with chronic illness, and care for individuals at the end of life. This research may also include families within a community context. According to its broad mandate, the Institute seeks to understand and ease the symptoms of acute and chronic illness, to prevent or delay the onset of disease or disability or slow its progression, to find effective approaches to achieving and sustaining good health, and to improve the clinical settings in which care is provided. Nursing research involves clinical care in a variety of settings including the community and home in addition to more traditional health care sites. The NINR's research extends to problems encountered by patients, families, and caregivers. It also focuses on the special needs of at-risk and under-served populations, with an emphasis on health disparities. These efforts are crucial in the creation of scientific advances and their translation into cost-effective health care that does not compromise quality.

NINR accomplishes its mission by supporting grants to universities and other research organizations as well as by facilitating intramural research and training. The research fosters interdisciplinary collaborations to ensure a comprehensive approach to research on health promotion, illness, and disabling conditions. This approach is especially relevant in research such as that aimed at long-term care for the elderly, the special needs of women across the life span, bioethical issues related to genetic testing and counseling, biobehavioral aspects of managing the prevention and treatment of infectious diseases, end of life care, and environmental influences on risk factors related to chronic illnesses. NINR research includes all age groups and is based on adequate gender and minority representation.

NINR's intramural activities, with an interdisciplinary, patient-focused approach to human health and illness, are particularly suited to the research environment on the NIH campus. The unique clinical research facilities offer diverse opportunities for professional exchange and collaboration on questions related to patient care and quality of life. These studies also provide training opportunities that acquaint scientists with the research issues and clinical strategies employed by investigators in nursing research.

In addition, the Institute supports comprehensive research training and career development programs to prepare individuals with requisite skills to conduct nursing research in an interdisciplinary setting.

RECENT RESEARCH FINDINGS

The extent and scope of published findings from NINR-funded studies show the many ways nursing research contributes to the health of our nation's people.

Prenatal care and low birth weight: Due largely to high rates of prematurity and low birth weight (LBW), the U.S. ranks a disappointing 25th among industrialized nations in infant mortality. Researchers examined the effectiveness of a prenatal telephone monitoring intervention in reducing preterm and LBW deliveries among high-risk pregnant women. After a home visit with the expectant mothers, registered nurses provided on-going telephone contact up to the 37th week of pregnancy to assess signs of preterm labor and discuss nutrition, smoking, drug use, and other topics of concern to the prospective mothers. The intervention reduced LBW outcomes by 26%. For African American women 19 years or older, there was a 44% reduction in premature births, resulting in an average cost savings per pregnancy of \$277 while reducing potential long-term developmental problems. The investigators then developed new programs with private funding. One is affiliated with a national health maintenance organization to provide prenatal advice to subscribers by telephone. (*Moore, Wake Forest University*)

End-of-Life decisions: The majority of deaths in the United States occur within the hospital setting, and almost 70% of hospital deaths follow a decision to limit aggressive treatment. At these times, the patient often is incapacitated, and the final decision on withdrawal of support rests with the family. Nurse investigators interviewed family members and clinicians who participated in a decision to withdraw support. Family members emphasized the factors weighed in making the decision and the stress it caused. Clinicians outlined conversations with the family that contributed to the decision. Stress levels for family members were extremely high, and remained elevated even after 6 months. Highest stress levels were recorded in the absence of a patient advance directive to help support the decision. Participants with low stress scores, in contrast, tended to achieve acceptance and calming from a sense of "doing the right thing," and of following the patient's wishes. Both clinicians and family members cited patient preference as the chief factor in the decision. These findings show that advance directives can aid family members to reduce stress in end-of-life decisions. (*Tilden, Oregon Health Sciences University*)

Vaginal delivery after a c-section: Approximately 60% of women with a prior delivery by c-section opt to attempt labor in a subsequent pregnancy. A research team analyzed the risk of uterine rupture for this procedure. Uterine rupture may have serious consequences that include hysterectomy, urologic injury, or severe blood loss for the mother, and neurologic impairment in the infant. Compared to the very low risk of rupture during a repeat c-section, the risk during uninduced labor was over 3 times as great. However, during labor induced by prostaglandins the risk increased to 15 times as great. Women attempting vaginal delivery after a c-section need to be aware of these risks, and the decision to perform an initial cesarean delivery should include the potential effect on future pregnancies. (*Lydon-Rochelle, University of Washington*)

Transitional Care: Researchers developed a model for the transition from hospital to home care that has been tested in a variety of patient populations, including low birth weight infants, at-risk pregnant women, and elders with cardiac problems. Successful transitional care is particularly critical at a time when cost-driven reductions in the length of hospital stays have resulted in the discharge of sicker patients requiring support to continue their recovery at home. In a recently-published study, these researchers reported on a modification of this model applied to prenatal and infant care. Low-income, at-risk pregnant women received half of their prenatal care through home visits by advanced practice nurses that emphasized teaching, counseling, and monitoring for signs of problems. After delivery, care continued with one home visit, weekly telephone calls, and daily telephone availability. Compared to a control group receiving standard prenatal care, women in the intervention had fewer prenatal hospital stays, fewer preterm births, and more twin pregnancies carried to term. There were also fewer infant deaths and rehospitalizations. The intervention saved a total of 750 hospital days at a total cost of roughly \$ 2 ½ million dollars. Thus, this model of care improved pregnancy and infant outcomes while reducing costs. (*Brooten, Case Western Reserve University*)

Workplace issues: Media reports on the nursing shortage, medical errors, and uneven quality of patient care have gained public attention. Similar reports from Canada and the United Kingdom show these are international concerns. A recent survey of over 43,000 nurses in 5 countries found widespread discontent. In the US, more than 40% of responding nurses expressed dissatisfaction with their jobs, and 43% scored in the high burnout range for job-related stress. Across all five countries, 17 to 39% of nurses plan to leave their jobs within the next year. General concerns included poor workplace environment, adequacy of staffing, scheduling problems, provision of ancillary services, loss of nurse executive positions, and lack of management support, while areas of job satisfaction included good working relationships with physicians and satisfaction with current pay. These responses reflect long-term problems within the profession on growth, recruitment, and retention. (*Aiken, University of Pennsylvania*)

Depression intervention in college-age women: Negative thinking and low self-esteem are risk factors for developing depression among college-age women. Depression impairs academic performance, school satisfaction, and social performance. Researchers tested a preventive cognitive-behavioral intervention program for college-age women found by psychometric screening to have subclinical signs of depression. The intervention consisted of 6 weekly group sessions designed to promote positive behavioral changes, decrease negative thinking, and enhance self-esteem. Women in the intervention group showed fewer depressive symptoms, less negative thinking, and higher self-esteem even at an 18 month follow-up. (*Peden, University of Kentucky*)

Treating urinary incontinence: Urinary incontinence (UI) is a common problem, especially among women. Nearly 20% of women between the ages of 25 and 64 have experienced UI, and 31% of women during perimenopause report having UI at least once a month. While UI may result from conditions such as infection, nerve damage, or heart disease, many women choose not to discuss incontinence with their health provider out of

embarrassment. However, one researcher has found that most cases of UI can be managed through behavioral controls and pelvic muscle exercises. These simple, straightforward behavioral techniques maintain long-term control and compare favorably with more invasive and complex therapies. (*Dougherty, University of North Carolina*)

Long-term neurological outcomes of NICU survivors: Medical complications of prematurity and low birth weight (LBW) that require initial care in a newborn intensive care unit (NICU) may have long-term developmental sequelae. Researchers conducted a prospective longitudinal study to examine neurological status and school performance of NICU survivors. Infants with documented neurological symptoms in the NICU had the most long-term complications, while those classified as neurologically normal had higher cognitive scores at 4 and 8 years of age. In general, preterm infants required more academic resources as they entered school age, and scored lower in reading and math achievement. While advances in neonatal care have improved survival, morbidity and resultant cognitive deficits remain a substantial societal cost. (*McGrath, University of Rhode Island, Kingston*)

Monitoring patients after organ transplant: One year survival rates for organ transplant recipients have increased significantly, from 47 % in 1986 to 77% in 2000. During the first year following a transplant, however, patients have their highest risk for infections and acute rejection. With prompt intervention, survival rates increase and health-care costs associated with hospitalization for organ failure are reduced. A nurse researcher developed a home-monitoring program for lung transplant patients to detect early signs of infection and rejection during the period between health care visits. This enabled patients to receive immediate attention at the first sign of suspicious change in their health status. This new home-monitoring approach fostered good adherence over the first critical year following transplantation and helped smooth the transition from the hospital to the home setting, while enabling the patients to play an important role in managing their own health. (*Finkelstein, University of Minnesota*)

Cardiovascular risk in adolescents: Prevention of cardiovascular disease (CVD) risk factors needs to start early in childhood to have the best chance of success. Researchers in North Carolina developed the Cardiovascular Health in Children and Youth (CHIC) program, targeting elementary school children. Researchers assessed the children for activity level and body composition. An intervention taught by regular classroom and physical education teachers provided information on heart-healthy foods, the importance of regular physical exercise, the dangers of smoking, and ways to combat peer pressure to smoke. Total cholesterol levels and measurements of body fat in these young people were significantly reduced following the intervention, and their fitness, physical activity, and knowledge about CVD risk factors improved. (*Harrell, University of North Carolina*)

Hypertension in young African American males: Hypertension is a key risk factor in cardiovascular disease (CVD) and may lead to heart failure, kidney failure, or stroke. CVD contributes to the higher mortality rate of African Americans compared to Caucasians. African Americans tend to develop hypertension at an early age; however, young black men have the lowest rates of awareness, treatment and control. Recruiting

men from community outreach programs and emergency room follow-ups, researchers conducted a pilot study intervention in which a nurse practitioner, community health worker, and physician team provided free care and medication for young African American men for 12 weeks. This intensive intervention achieved effective control of high blood pressure in two-thirds of the subjects, while maintaining a noteworthy 91% retention rate in this hard-to-reach population. *(Hill, The Johns Hopkins University)*

Gender differences in pain response: Pain can exert a powerful influence on recovery from illness and on quality of life. However, research into pain is difficult because of its subjective nature. While studying medications for pain relief, researchers found that gender plays a significant role in pain perception. They noted that women gain relief of intense, short-term pain from a little-used class of medications called kappa-opioids, such as nalbuphine and butorphanol, whereas in men these drugs had little effect. Kappa-opioids also seem to have fewer negative side effects, such as nausea, confusion, and constipation, than mu-opioids like morphine. This unexpected result will impact future research on pain perception and treatments. *(Levine and Miaskowski, University of California at San Francisco)*

Arthritis treatment in Hispanic elders: Until recently, elder Hispanic Americans suffering from arthritis had few resources available to them about how to live with their condition and manage its symptoms. However, investigators developed and evaluated an Arthritis Self Management Program in Spanish, which includes classes, a Spanish-language book, and exercise and relaxation tapes. The self-management course is meant to supplement medical care by providing patients with detailed information about arthritis management. Patients learn how to communicate with health care professionals; how to deal with pain, fatigue and depression, how to exercise, and what types of exercise should be undertaken. *(Lorig, Stanford University)*

Premature infant care: Premature infants are too neurologically immature to regulate their own body temperature. They are usually placed on warming beds or in incubators for warmth, separating them from parental contact at a time when bonding between infant and parent is vital for normal development. Nurse researchers found significant benefits in kangaroo care (KC), a technique that provides physiologic stability for the infant and a chance for close contact for the parents. KC involves placing the diaper-clad infant on the bare chest of the caregiver. While in KC, the infants are calm and experience quiet sleep, which temporarily removes them consciously from the busy, noisy, hectic atmosphere of the NICU. They also have more regular breathing patterns, attain better thermoregulation than when in the incubator, gain weight faster, and leave the hospital sooner. KC also gives the parents an opportunity to provide a unique form of care, increases infant bonding, and may help the mother produce more milk. *(Ludington, University of Maryland)*

Disadvantaged families and nurse home visits: Disadvantaged families may get caught up in a cycle of poverty, neglect, domestic violence, substance abuse, and other health and social problems, unless steps are taken to intervene. A research team conducted a series of studies involving home visits to disadvantage young pregnant mothers by

nurses, who continued to provide family assistance into the early childhood period. Follow-up studies 15 years later showed fewer childhood injuries and episodes of documented child abuse, fewer arrests of the mothers, and decreased dependence on welfare. A more recent project in urban Memphis, Tennessee, indicates that mothers receiving visits by nurses in their homes have significantly lower pregnancy-induced high blood pressure and better timing of subsequent pregnancies. Childhood injuries are also substantially reduced. *(Olds, University of Rochester)*

Suctioning procedure during mechanical ventilation: Mechanical ventilation is used to prolong the lives of many patients. However, the artificial airway can become clogged with secretions that interfere with air flow. Removal of these secretions through endotracheal suctioning must be performed correctly to avoid changes in blood pressure and heart rate, damaged tracheas, and even cardiac arrest and sudden death. Researchers at one hospital developed and tested a best practice protocol for suctioning, and implemented a training program for all nursing and respiratory care staff to assure uniformity and compliance. *(Stone, Ohio State University)*

Interventions for premenstrual syndrome: As experienced by many women, premenstrual syndrome (PMS) includes both physical symptoms, including cramping, headaches, and bloating, and emotional symptoms, including mood swings, anxiety, and loss of control. When severe, PMS can disrupt a woman's life, work, and social relationships. Researchers have tested an intervention model to reduce the severity of PMS and promote general health. Through group meetings and individual assignments, PMS sufferers learned how to be aware of their own symptoms, and developed specific strategies to cope. They also learned health practices, how to make changes in their diet and exercise habits, and how to manage their environment. Results from these behavioral interventions compared favorably to antidepressant drug therapy. *(Taylor, University of California at San Francisco)*

Childhood behavioral interventions: Moodiness, aggression, and a lack of respect for authority may be no more than passing phases in a child's life. However, if these behaviors become severe and habitual, they can disrupt educational and social development and interfere with family well-being. Researchers studied early interventions for the disruptive child and the family to cope with difficult behaviors. Parent training was designed to help strengthen communication and interpersonal skills, conflict resolution, and handling of the stress caused by the child's conduct. For children, the program used age-appropriate videotaped scenarios of "real life" conflict situations at home and at school, along with life-sized puppets to model appropriate behaviors. The children were encouraged to discuss their feelings and suggest alternative solutions. Through role-playing, videotape modeling, and practice, the children learned how to be friendly, listen and follow directions at school, manage their anger, and see things from others' perspectives. The parents and children together participated in counseling sessions to discuss coping skills to deal with anger, depression, stress, and rejection. Behavioral changes were shown to persist through a one-year follow-up. *(Webster-Stratton, University of Washington)*

Home care for elder cancer patients after surgery: Advances in surgery and chemotherapy have rendered most cancers treatable, but with shortening hospital stays many post-surgical cancer patients are discharged home in need of monitoring and treatment. For many older patients, home nursing care may be difficult to obtain or afford. Researchers evaluated a home care protocol in which patients received home visits and telephone follow-ups calls from an advanced practice nurse (APN) in the first four weeks after discharge. The APNs monitored patients for depressive symptoms, distress, and functional status. Specific interventions consisted of educating patients and caregivers, assessing recovery and monitoring physical and emotional status, providing psychosocial support, and making referrals to community services. Care from the APN improved two-year survival rates among these patients. *(McCorkle, Yale University)*

Improving care in Alzheimer's patients: Elderly patients with Alzheimer's dementia often require significant assistance with their activities of daily living (ADLs). Nurse researchers studied two modes of nursing-care assistance—usual care (UC), and functional rehabilitation (FR). Under UC, nurse aides assisted the patients with bathing, using the commode, dressing, and personal care in their normal routine. Under FR, a research therapist implemented a program of graded assists with ADLs and occupational therapy techniques to facilitate independent functioning. The FR program required more time, but the patients showed an increase in their independent behaviors. Dementia patients are prone to excess disability when nursing aids take over more of their care, but may be able to retain independent functioning to a greater degree with proper guidance. *(Burgio, University of Alabama)*

Improving prenatal care in minority women: Minority women tend to suffer particular stresses, due to cultural conflicts with the dominant culture. The resultant anxiety often hinders a pregnant woman's ability to understand her pregnancy and provide proper care for herself and her unborn child. Researchers studied women from three minority groups on an island in Hawaii, hoping to decrease stress, promote positive coping, and improve birth outcomes. Public health nurses conducted a series of group sessions, individual sessions, home visits, and telephone follow-up calls to address signs and symptoms of preterm labor, signs of depression, and signs of stress or family discord. The program also included access to ethnic healers, and developed a community watch providing outreach to identify women early in pregnancy for prenatal care. Women enrolled in this program received more prenatal care, and delivered fewer premature infants. Most of the extra cost of the program was covered by the improved birth outcomes. *(Affonso, Emory University)*

Treating chemotherapy-induced nausea: Nausea and vomiting are common symptoms following chemotherapy. Patients can vary widely in their susceptibility to chemotherapy-induced nausea, so identifying in advance those who are likely to develop nausea could help clinicians prevent or relieve symptoms more effectively. With a series of simple, noninvasive bedside tests, researchers found that changes in selected autonomic nervous system (ANS) parameters relate to treatment-induced nausea. Their work also suggests that patients who demonstrate abnormal ANS function might benefit from the administration of antiemetic medications. *(Morrow, University of Rochester)*

Confirming feeding tube placement: Placement of feeding tubes, often a routine procedure, has many potential complications related to the malpositioning of the small-bore tubes into the lungs or other areas. Radiography remains the safest and most reliable method of tube placement confirmation. Nurse investigators have discovered that measuring the pH and bilirubin of aspirated feeding tube contents identifies misplacement of tubes in lungs with 100 percent accuracy. Currently there is no bedside measure of bilirubin. However, following further testing, refinement and approval by the Food and Drug Administration, assessing the contents of feeding tube aspirates using a visual bilirubin test in combination with pH may vastly improve the accuracy and lower the cost of confirming feeding tube placement at the bedside. (Metheny, St. Louis University)

Management of teens with Type 1 diabetes: Self-management of insulin-dependent (type 1) diabetes presents challenges for most age groups, but particularly for adolescents. Issues of physical, emotional, and social development can complicate self-monitoring and intensive treatment management, resulting in poor metabolic control and increased risks of complications. Researchers developed a behavioral intervention geared to problems common in diabetic teens emphasizing the development of coping skills, social skills and problem solving, cognitive behavior modification, and conflict resolution. The researchers concluded that the program not only improved long-term metabolic control and quality of life among the teenage subjects, but also enhanced their skills in other areas, such as self-efficacy. Sustaining the metabolic control could reduce the risk of retinopathy and microvascular complications by 30-50%. (Grey, Yale University)

Care of AIDS patients in hospital units: AIDS patients requiring hospitalization may be cared for in a wide variety of units. Researchers examined patient outcomes to compare the effects of a dedicated AIDS unit against care in scattered-bed settings. Care on AIDS units, with higher nurse-patient ratios and closer involvement of nurses and physicians with specialized AIDS experience, significantly lowered mortality within 30 days of admission. Also, patients were significantly more satisfied with their care. Health professionals need to make AIDS patients aware of potential benefits of AIDS dedicated units, but be sensitive to the possibility of stigmatization. (Aiken, University of Pennsylvania)

Nurses and breast cancer counseling: With the growth of genetic testing and genetic therapy, nurses will become more involved in counseling and assisting patients and families on risks and benefits of new procedures. Researchers evaluated the efficacy of nurse-led educational counseling for breast cancer genetic susceptibility. Of women subjects who had a first-degree relative with premenopausal breast cancer, most understood the limitation of testing, and almost all reported a high degree of perceived autonomy in decision-making. Most women reported high satisfaction with their counseling session. With training, nurses can provide effective education about genetic testing for breast cancer susceptibility. (Geller, The Johns Hopkins University)

Risk Factor Management in Cardiovascular Disease: In 1995, the American Heart Association published a guide to comprehensive risk reduction for patients with coronary and vascular disease. However, application of risk reduction strategies remains inconsistent. Researchers investigated the status of risk factor control in patients undergoing treatment for coronary revascularization. They assessed baseline risk factors, including dietary intake, physical activity, and smoking behaviors, along with lipid and cholesterol profiles. Almost three-quarters of patients were hypertensive, almost half were overweight, more the three quarters had diets high in total fat and saturated fat, and only one third exercised regularly. While 47% of hyperlipemic patients were on lipid-lowering medications, none had achieved proper lipid control. Only about one third of patients were on ACE inhibitors, while about half were on beta blockers. These results indicate that patients diagnosed with cardiovascular disease are not sufficiently motivated to make lifestyle changes, and are receiving inadequate management of potential risk factors. (Allen, The Johns Hopkins University)

Improving recruitment of minorities into clinical trials: African Americans have disproportionately high incidences of disease and illness compared to Caucasians, yet they are under-represented in clinical trials. Investigators into this disparity found one reason to be an historical disregard for African Americans as research subjects. They found that the effective recruitment and retention of African Americans for clinical trials requires several factors, including historical cognizance, community sanctioning of the study, trust building through openness and cooperation, benefit to the community, recognition of diversity within the African American community, and researcher self-reflection and introspection on cultural assumptions. This model should help correct the disparity of minority participation in clinical trials. (Neese, University of North Carolina, Charlotte)

Cultural differences in descriptors for asthma: The words currently used to describe the symptom of breathlessness are derived from samples of primarily white subjects, and do not reflect the impact of culture on the language of symptom perception. In a laboratory setting during an asthma attack, African Americans described their breathlessness differently from Caucasians, with African Americans using more upper airway descriptors. Educating health professionals about the unique ethnic language of breathlessness may prevent the undertreatment of acute asthma episodes in African Americans. (Janson, UCSF)

Lead exposure awareness: Almost 900,000 children in the US under the age of six have elevated blood levels of lead. In a telephone and mail survey, researchers found significant knowledge gaps about lead exposure among families with less education, the unemployed, females, and the elderly. Almost one quarter of mothers in one rural setting were unaware of the risks of lead exposure *in utero*. Nurses and other health care workers need to expand efforts to increase public knowledge of lead risks. (Polivka, Ohio State University)

Cerebral oxygen levels during suctioning: Critical care patients with severe brain injuries run a secondary risk associated with oxygen loss from swelling, ischemia, and

elevated intracranial pressure (ICP). In patients requiring mechanical ventilation, routine endotracheal suctioning may cause transient increases in ICP. Nurse investigators studied cerebrovascular changes in trauma patients during suctioning to examine fluctuations in ICP and oxygen levels. As long as elevations in pressure were transient, suctioning did not appear to impair cerebral oxygenation. (*Kerr, University of Pittsburgh*)

Irritable Bowel Syndrome and Abuse: Irritable Bowel Syndrome (IBS) is characterized by symptoms of abdominal pain and changes in stool pattern and consistency, with no markers of organic dysfunction. One factor thought to contribute to IBS is a history of sexual and/or physical abuse, either during childhood or as an adult. Many studies have found an increased level of abuse experiences among those diagnosed with IBS. Nurse researchers interviewed women between the ages of 18 and 40 for symptoms of IBS and a history of abuse. Women diagnosed with IBS reported more unwanted sexual contact during childhood, and women who experienced abuse reported a greater hindrance of daily activities due to GI symptoms. (*Heitkemper, University of Washington*)

Promoting safer sex among college students: Discussing safer sex options with a partner is an important first step in any new sexual relationship. Nurse researchers surveyed students on college campuses to learn how they negotiated safer sex and what circumstances fostered communication on safer sex practices. Several factors lead to conversations about safer sex, including self-confidence, sense of responsibility for bringing up the issue, and whether the student had conversations about sex with her or his parents. (*Dilorio, Emory University*)

OVERVIEW OF CURRENT RESEARCH

Neurofunction and Sensory Conditions

Conditions of cognitive impairment, such as Alzheimer's Disease, are a major public health concern, with implications for the quality of life of both the patient and the caregiver. NINR projects in this area include:

- In an ongoing joint project with the National Institute on Aging, testing a cognitive function intervention to postpone the need for institutional care. (*Unverzagt, Indiana University, Hebrew Rehabilitation Center for the Aged*)
- Developing an exercise program to improve physical function and basic mobility. (*Tappen, Florida Atlantic University*)
- Testing a self-care activity intervention and light therapy to decrease sleep disturbance and agitation. (*Dowling, Goldman Institute on Aging*)

Chronic neurologic conditions such as epilepsy and multiple sclerosis can strike people of all ages. Projects in this area include:

- Determining factors associated with self-management practices in patients with epilepsy. (*DiIorio, Emory University*)
- Identifying predictive factors in child adaptation to epilepsy (*Austin, Indiana University*)
- Studying relationships between quality of life, functional status, and health behaviors in multiple sclerosis. (*Stuifbergen, University of Texas at Austin*)

Pain, responsible for 40 million health care visits each year, can impede recovery and impact daily functioning. Pain management studies include:

- Investigating the role that gender and sex hormones play in acute pain perception and relief. (*Levine, UCSF*)
- Constructing an objective pain assessment tool for infants (*Evans, Medical College of Ohio*), and for nonverbal children undergoing leukemia treatment. (*Van Cleve, Loma Linda University*)
- Investigating the relationship between pain and immune function. (*Page, The Johns Hopkins University*)

Sleep disturbance is associated with an increased risk of accidents, and a decline in cognitive function and quality of life. Studies on sleep include:

- Exploring the effect of temporary sleep restrictions in healthy young adults. (*Dinges, University of Pennsylvania*)
- Evaluating behavioral and emotional consequences of sleep deprivation in children and adolescents. (*Carskadon, Brown University*)
- Studying the effect of fibromyalgia and neuroendocrine imbalances on sleep and wake times in women. (*Landis, University of Washington*)

Reproductive and Infant Health

Care of pregnant women, infants, and young families can have major public health implications, as well as long-term effects on quality of life. In the area of pregnancy and perinatal care, NINR projects include:

- Studying the biological and psychosocial mechanisms for poor fetal growth, including substance abuse, stress, and abuse. (*Curry, Oregon Health Sciences University*)
- Evaluating the effect of exercise on reducing recurrence of preeclampsia. (*Patrick, Magee Women's Research Institute*)
- Identifying behavioral effects of stress and disposition on coping, health behavior, and birth outcomes. (*Lobel, SUNY-Stonybrook*)
- Exploring the relationship between perineal trauma during birth and urinary incontinence. (*Sampselle, University of Michigan*)
- Evaluating the role of nurses providing continuous care during labor in decreasing birth complications. (*Hodnett, University of Toronto*)
- Studying the psychological and physiological effects of bedrest in the treatment of high-risk pregnant women. (*Maloni, Case Western Reserve University*)
- Examining the concerns and challenges of pregnant adolescents making the transition to motherhood. (*Smithbattle, Saint Louis University*)
- Developing a “buddy system” of peer support for pregnant adolescents for smoking cessation. (*Albrecht, University of Pittsburgh*)

Studies on the care of the mother and infant after delivery include:

- Promoting breastfeeding with the assistance of advanced practice nurses for mothers of low birth weight infants. (*Brown, University of Pennsylvania*)
- Enhancing parents' involvement in treatment decisions and collaboration for infants in NICUs. (*Penticuff, University of Texas at Austin*)

Research into infant health and development and promoting parenting skills includes:

- Examining the long-term developmental and behavioral outcomes of children born with very low birth weights. (*McGrath, University of Rhode Island*)
- Promoting mother-infant bonding and understanding of infant cues in full-term and preterm infants. (*Anderson, Case Western Reserve University*)
- Decreasing infant irritability and parental stress, and enhancing infant state transitions and parent–infant interactions. (*Keefe, Medical College of South Carolina*)

Research in the area of reproductive health and fertility includes:

- Examining the risk of depression among previously infertile women after achieving a first pregnancy and after delivery. (*Olshansky, Duquesne University*)

Immune Responses and Oncology

Risks, prevention, and symptom management of diseases such as HIV/AIDS and cancer, and preventing the development and spread of contagious diseases, continue to be prominent public health concerns. Research into AIDS includes:

- Developing culturally-specific AIDS prevention strategies among females in the Latina population. *(Peragallo, University of Maryland)*
- Improving patient confidence and self-efficacy in managing symptoms, disabilities, and lifestyle challenges to improve quality of life and adherence to treatment. *(Holzemer, UCSF)*
- Developing a peer counseling intervention for rural women to overcome isolation and address depression, disease management, and quality of life. *(Moneyham, University of South Carolina)*

Studies addressing cancer prevention, screening, and treatment include:

- Developing a reliable measure of lymphedema to evaluate changes and standardize assessment and treatment in breast cancer patients. *(Armer, University of Missouri)*
- Improving mammography screening among older women through individualized, computer-tailored telephone counseling. *(Champion, Indiana University)*
- Surveying childhood cancer survivors in adolescence regarding protective factors, family and social support, social integration, and illness-related factors. *(Haase, University of Arizona)*
- Enhancing the ability of men with prostate cancer to cope with the uncertainty of their illness and manage their treatment. *(Mishel, University of North Carolina)*

Research into preventing and treating infectious diseases includes:

- Developing a simple filtration system for ground water to prevent the transmission of cholera in developing nations. *(Huq, University of Maryland)*
- Tracking recently-released jail inmates with latent tuberculosis infections for completion of tuberculosis preventive therapy. *(White, UCSF)*
- Exploring the effects of exercise on the release of cytokines related to non-specific immune function in rats. *(Rowsey, University of North Carolina at Chapel Hill)*

Cardiopulmonary Health, Wound Healing, Critical Care, and Transplantation

Cardiovascular and respiratory diseases are major causes of debility and mortality in the United States. Wound care is an important aspect of nursing care in many settings. Advances in treatments and therapies are improving recovery from trauma and bringing more people into contact with critical care. Organ transplantation is a fast-growing area of health care with many advances in treatment. Areas of cardiovascular research include:

- Decreasing risk factors for cardiovascular disease in young adults, including behaviors such as smoking, eating foods high in saturated fats, and lack of physical activity. *(Harrell, University of North Carolina at Chapel Hill)*
- Studying the protective role of certain fish oils with omega-three fatty acids in reducing blood pressure, serum lipids and platelet aggregation. *(Engler, UCSF)*
- Developing an community-based intervention team to diagnosis and treat young African American men with hypertension. *(Hill, The Johns Hopkins University)*

Research into respiratory conditions and symptoms includes:

- Managing and treating asthma to improve compliance and prevent attacks in multi-ethnic inner city children. *(Yoos, University of Rochester)*
- Evaluating the effectiveness of various nurse-led exercise regimens on relieving dyspnea and improving pulmonary function in patients with COPD. *(Carrieri-Kohlman, UCSF)*

Research into skin integrity and wound care includes:

- Studying the composition of vernix and its role as a skin barrier in term and preterm neonates. *(Hoath, University of Cincinnati)*
- Developing a tool to predict patients at risk for developing pressure ulcers for elderly patients in long-term care facilities, to decrease physical debilitation and the hospital costs of wound care. *(Bergstrom, University of Nebraska)*

Research into improving critical care practice following head trauma includes:

- Preventing increased intracranial pressure during routine procedures such as endotracheal suctioning with improved technique and possible use of neuromuscular blockade. *(Kerr, University of Pittsburgh)*
- Reducing brain injury following acute trauma using chelation therapy to ameliorate the metabolic decay caused by oxygen and iron released from injured blood cells. *(Hurn, The Johns Hopkins University)*

Studies on improving post-transplant care include:

- Improving autonomic nervous functioning to enhance sleep, movement, and appetite. *(Hathaway, University of Tennessee, Memphis)*

Chronic Illness and Long-Term Care

Chronic illnesses such as diabetes and arthritis can exert their effect across the lifespan, complicating efforts to manage and treat the symptoms and prevent worsening of the condition. Caregivers of patients with long-term conditions face particular stresses. Current diabetes research includes:

- Teaching self-management skills and behavioral modifications to young diabetics starting at age 8, and analyzing the cost of intervention. *(Grey, Yale University)*
- Studying the cardiovascular risk factor of adolescents with type 1 and type 2 diabetes. *(Faulkner, University of Chicago)*
- Evaluating family processes and development of autonomy in both white and black adolescents with diabetes. *(Dashiff, University of Alabama)*
- Exploring the knowledge and beliefs of non-diabetics on the causes and treatment of type 2 diabetes among low-income populations of various ethnic groups in rural and small town settings. *(Skelly, University of North Carolina)*
- Studying the use of talking circles in helping American Indians with type 2 diabetes manage their disease. *(Hodge, University of Minnesota)*

New research into arthritis management includes:

- Studying exercise programs to improve conditioning and functioning elders with arthritis of the knee. *(Topp, Medical College of Ohio)*
- Evaluating low-impact exercise on pain, fatigue, activity level, and depression in middle-aged persons with rheumatoid arthritis. *(Neuberger, University of Kansas)*

Research into urinary incontinence includes:

- Studying the efficacy of biofeedback and pelvic muscle exercises on urinary control in adult women. *(Kincade, University of North Carolina)*

Research into family caregiving and care delivery in informal settings includes:

- Describing models of non-kin caregivers in developing relationships with dependent elders. *(Barker, UCSF)*
- Describing the experiences with home care of elderly widows living alone. *(Porter, University of Missouri-Columbia)*

Research into long-term care and quality of nursing home care includes:

- Establishing a protocol to prevent incontinence and improve care collaboration. *(Beck, University of Arkansas)*
- Describing care delivery processes and the relationship between staffing and cost of care to outcomes. *(Rantz, University of Missouri)*
- Studying available home care resources and discharge status at the end of care. *(Fortinsky, University of Connecticut)*

Health Promotion and Risk Behaviors, Environmental Health, Women's Health, and Mental Health

Promoting healthy lifestyles and decreasing risk behaviors could have an impact on overall quality of health while reducing health care expenditures. Environmental factors can have wide-ranging health effects. Research into women's health has been undervalued in the past. Treatment of mental health to maintain social functioning can impact many lives. Current research into health promotion includes:

- Studying the strategies used and difficulties encountered by subjects attempting smoking cessation. *(O'Connell, Columbia University)*
- Assisting inner city minority youth in social adjustment and improving self-perception. *(McClowry, New York University)*
- Studying the efficacy of summer camp experiences on siblings of children with chronic diseases. *(Williams, University of Kansas)*
- Maintaining physical function in elders through exercises for strength, range of motion, and postural stability. *(Roberts, Case Western Reserve University)*

Environmental health studies include:

- Studying the effectiveness of lead poisoning education in rural communities to improve health and reduce lead exposure and subsequent costs in children. *(Polivka, Ohio State University)*

Studies in women's health include:

- Participating in the multi-site Study of Women's Health Across the Nation (SWAN) program to examine health factors in middle-aged women approaching menopause. *(Sowers, University of Michigan)*

Studies in mental health include:

- Developing an instrument to assess suicide risk among young people and assessing its effectiveness in adolescents versus young adults. *(Thompson, University of Washington)*

End of Life Research

End of life care has become an important public health priority, yet this area faces many ethical concerns. Studies into end of life care and ethical decision-making include:

- Studying patients with advanced congestive heart failure and COPD for the prevalence, nature, and progression of symptoms, the impact these symptoms have on quality of life, and how they effect on health care costs and utilization. (*Tennstedt, New England Research Institute*)
- Examining the effect of treatment for depression on desire for death in terminally ill patients. (*Breitbart, Memorial Sloan Kettering Cancer Center*)
- Comparing African American and white populations on end of life treatment preferences, autonomy in decision-making, and satisfaction with care. (*Phipps, Albert Einstein Healthcare*)
- Improving quality of communication between clinicians and family members in the intensive care setting. (*Curtis, University of Washington*)
- Modeling end of life decision-making to focus on the preferences of terminally ill patients. (*Nolan, The Johns Hopkins University*)
- Classifying and describing the moral, ethical, and spiritual issues for clinicians and family in moving from curative to palliative care. (*Buchman, Washington University*)
- Examining ethnic differences and investigating distrust of health care among disabled African Americans. (*Bonner, University of Illinois at Chicago*)

Studies on caregiver support include:

- Describing end of life preferences for patients with end-stage renal disease and their spouses, changes over time, and the burden of stress and grief on the caregiving spouse. (*Pruchno, Boston College*)
- Assisting caregivers of hospice patients to manage the specific problems of the cancer patient at the end of life and to improve coping skills. (*McMillan, University of South Florida, co-funded with the National Cancer Institute*)
- Providing psychosocial support to elderly caregivers of terminal cancer patients. (*Rubert, University of Miami*)

Research into quality of life issues includes:

- Investigating the use of life support technology in patients in a persistent vegetative state and the effect on caregivers. (*Kaufman, UCSF*)
- Comparing the actual versus the expected outcomes of initiating tube feedings in older individuals with chronic neurological conditions and other severe illnesses. (*Carey, University of North Carolina at Chapel Hill*)
- Examining utilization of medical resources and place of death for individuals enrolled in a managed care program, including related costs and quality of life and death. (*Mukamel, University of Rochester*)

OTHER NINR RESEARCH INITIATIVES

Nursing Research Centers

The National Institute of Nursing Research has historically supported the development of research infrastructure in schools of nursing through Core Center (P30) grants. In institutions with a strong, established base of research funding, these grants provide funds to centralize resources and facilities to support an active center of excellence in a specific area of scientific inquiry. However, as nursing research remains a young science, many institutions are in the earlier stages of establishing nursing research programs. The Nursing Research Exploratory Center (P20) grants were offered to assist these institutions with developing research programs and a research infrastructure by augmenting the research resources in schools, colleges, or departments of nursing. Funds will support planning for new programs to facilitate growth and development, expansion or modification of existing research resources, pilot or feasibility studies, and interdisciplinary collaboration.

The nine current P30 Core Centers are:

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| • University of Pittsburgh | Center for Research on Chronic Diseases |
| • University of North Carolina at Chapel Hill | Center for Chronic Health Conditions in Rural Dwellers |
| • University of Iowa | Gerontological Nursing Interventions Research Center |
| • University of Washington | Center for Women’s Health Research |
| • Indiana University-Purdue at Indianapolis | Center for Enhancing Quality of Life in Chronic Illness |
| • UCLA | Center for Vulnerable Populations Research |
| • University of South Carolina at Columbia | Health Promotion/Risk Reduction in Special Populations |
| • University of Pennsylvania | Center for Nursing Outcomes Research |
| • University of Texas-Austin | Center for Health Promotion/Disease |

P20 Exploratory grants have been awarded to nine institutions working in a variety of research areas:

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|----------------------------|---|
| • Emory University | Center for Symptoms, Symptom Interactions, and Health Outcome |
| • Montana State University | Center for Chronic Health Conditions in Rural Dwellers |
| • University of Florida | Biobehavioral Research Center |
| • Columbia University | Center for Evidence-Based Practice in the Underserved |

- University of Arizona Center on Injury Mechanisms and Related Responses
- Yale University Self-Management Interventions for Populations at Risk
- Oregon Health Sciences University Symptom Management in Life-Threatening Illness
- Duke University Trajectories of Aging and Care in Nursing Science
- University of Illinois at Chicago Center for Research on Cardiovascular and Respiratory Health

Summer Genetics Institute

In the summer of 2000, the NINR launched the Summer Genetics Institute (SGI) on the National Institutes of Health campus. The SGI is a competitive, two-month summer program for graduate students, advanced practice nurses and faculty who are U.S. citizens or permanent residents. The need for better training in genetics is critical from both diagnostic and therapeutic perspectives. Knowledge about genetic technology is increasingly outdistancing the nursing profession's ability to counsel the public about how to handle genetic information, some of which may reveal a heritable disease that may currently be untreatable and fatal.

The eight-week SGI program is designed to provide a foundation in medical molecular genetics for use in clinical practice and the research laboratory. The program includes lecture, laboratory, and seminar components. The lecture component covers basic concepts and principles of genetics. In the laboratory, a case-based approach helps to integrate the concepts and principles of genetics with experiments designed to provide an understanding of genetic testing, detection of genetic disease, the strengths and limitations of genetic approaches, and how to use the information clinically to counsel individuals and families. The seminar component addresses ethical, legal, and clinical practice issues and perspectives, and the role of the nurse in the area of genetics.

Course work is at the post baccalaureate/master's level, and this two-month program awards 12 hours of graduate credit. Students receive a monthly stipend during their participation in the program (June and July) to cover housing and modest living expenses.

An early program evaluation demonstrates that SGI graduates are making significant contributions to nursing science related to genetics by successfully obtaining funding for research, developing courses on nursing and genetics in both graduate and undergraduate programs, writing for publication in peer reviewed journals, presenting at numerous professional meetings, serving on expert panels related to genetics, and spearheading efforts to incorporate genetics across the nursing curriculum.

Minority Health Partnerships

In February, 2001, the NINR and the National Center on Minority Health and Health Disparities (NCMHD) presented a pilot initiative to create partnerships between minority-serving nursing schools and more research-intensive university nursing research programs, in order to build the capacity for nursing research on health disparities. The goals of this initiative are to broaden the scope of health disparities research, assist the development the research careers of minority nurses, train non-minority researchers to participate in research in underserved communities, expand the number of schools involved in minority research, and provide a viable career foundation for nurse researchers in the area of health disparities. The four broad research areas targeted in this initiative are: (1) health disparity and disease prevention, (2) research training, (3) health disparity education, and (4) community outreach.

In developing these partnerships, requirements for the majority schools included a willingness to partner and prior experience with partnerships, willingness to assist in the training and mentoring of minority nursing students and faculty, minority representation within the institution, commitment to improve the health of minorities and underserved populations, and prior receipt of a P30 or R01 grant from NINR. The minority schools had to demonstrate a willingness to build upon existing institutional strengths and to assist in the building of the research capacity within the field of nursing, and a commitment to support and collaborate with others to develop faculty and students to participate in research. The partnering schools had the opportunity to apply for an administrative supplement to a current R01 Research or P30 Core Center grant to increase their capacity for health disparities research.

Following a review to evaluate scientific merit, seven awards in a variety of geographic settings have been made to the following partnering schools:

- University of Iowa and Alcorn State University
- Yale University and Howard University
- University of Pennsylvania, Hampton University, and the National Coalition of Ethnic Minority Nurses Associations
- University of Texas at Austin, New Mexico State University, and University of New Mexico
- University of Michigan at Ann Arbor and University of Texas at San Antonio
- University of California at San Francisco and University of Puerto Rico
- University of North Carolina at Chapel Hill and North Carolina Central University.

The NINR will continue to develop strategies to improve research in all areas of health care, towards the *Healthy People 2010* goal of reducing or eliminating health disparities. Expanding the number of schools and institutions involved in health disparities research will develop a growing cadre of minority nurse researchers address the national problem of health disparities. Many positive gains will emerge from such partnerships between schools of nursing.