

# Nursing Research—Making a Difference



The past 20 years have been marked by significant advances in research—discoveries that translate into direct benefits for patients and their families. Selected research findings are described below, with reference to strategic research opportunities. These accomplishments underscore the importance of past and future investment in the most productive and promising areas of our science. NINR will continue to consult with the research community and monitor areas of need in order to identify and capitalize on research opportunities.



- ◇ **YOUNG AFRICAN-AMERICAN MEN IN INNER CITIES** are at particular risk for the complications of uncontrolled hypertension. Many have never had contact with health care providers. A culturally sensitive behavioral and pharmacological intervention, delivered by a nurse-led multidisciplinary team at the community level, helped these men manage their hypertension. The study also demonstrated that clinic visits should be supplemented by outreach to these vulnerable young men. This work is helping to change clinical practice and is cited by the American Heart Association's Council on High Blood Pressure Research in recommendations for blood pressure measurement.
- ◇ **PEOPLE LIVING IN RURAL ENVIRONMENTS** may have little access to resources that can help them initiate and sustain healthy behaviors. Culturally sensitive interventions have been shown to reduce risk factors and improve the health of people suffering from health disparities. Rural-dwelling African-Americans responded to a series of classes that focused on preparing healthy, low-fat foods, and included practical and culturally compatible strategies for reducing the use of fats. Participants successfully lowered their dietary fat intake and their body weight, and showed a slight improvement in glucose control and lipid levels.
- ◇ **RISKS FOR HEART ATTACK, STROKE, AND DIABETES ARE EVIDENT IN CHILDHOOD**, long before the damage is done and symptoms appear. A school-based education and exercise program helped children initiate healthy behaviors to improve their cardiovascular health, and promises to provide health benefits that extend well into adulthood. Offering the program in the classroom to all children, regardless of risk factors, proved more effective than providing the same intervention to small groups of children at risk. These findings suggest that health-promoting interventions can be easily integrated into the curriculum without disrupting the class, stigmatizing certain children, or requiring special teaching resources.

◇ **CHILDREN WITH FAMILIAL LIPID DISORDERS** may need more than behavioral measures to prevent heart disease. In a clinical trial, children received nutritional counseling and followed a diet based on the National Cholesterol Education Program Step II and food pyramid dietary guidelines. Some of the children also received supplements containing docosahexaenoic acid (DHA), an omega-3 fatty acid. Children who received the supplements experienced a significant increase in blood flow in certain blood vessels compared to controls and participants who received a placebo, indicating that DHA improved vascular function in children with high levels of blood lipids. A subsequent study demonstrated that administration of DHA supplements in this population resulted in an improved lipid profile that may have contributed to the observed improvements in vascular function and could help delay the early development of heart disease.

◇ **APPROXIMATELY ONE IN EVERY 400-500 CHILDREN AND ADOLESCENTS HAS TYPE 1 DIABETES**, and the incidence of type 2 diabetes is rising. The increase in obesity, poor nutrition, and lack of physical activity are major contributors to diabetes in all age groups, and pose special challenges for adolescents. Teens must contend with hormonal changes that make them resistant to insulin, social pressures to engage in unhealthy behaviors, and schedules that can disrupt regular blood glucose monitoring, diet, and exercise. Intensive diabetes management training improves metabolic control. However, studies have shown that control can be significantly enhanced when coping skills training (CST) is provided at the same time. CST uses role-playing and feedback to develop skills in social problem-solving and conflict resolution, focusing on dealing with problems rather than on managing a medical condition. It has been incorporated into routine care by many practices that serve teen patients, and current clinical guidelines on type 1 diabetes now emphasize behavioral training in addition to disease management.



- ◇ **ARTHRITIS IS THE LEADING CAUSE OF DISABILITY AMONG PEOPLE OF HISPANIC ORIGIN** in the U.S., and a lack of proficiency in English limits the ability of many to take advantage of potentially useful health information. A short, community-level self-management program administered in Spanish has been shown to improve elements of health status while reducing health care costs. After one year, participants experienced less pain, increased their activity levels, and reduced their physician visits by 40 percent. The study group also showed improvements in self-efficacy (confidence in being able to manage their disease), general health, exercise, disability, and depression. This approach has been widely adopted in the U.S. and other countries, and efforts are underway to extend it to diabetes and possibly other chronic diseases.
- ◇ **PATIENTS LEAVING THE HOSPITAL** with certain conditions often have difficulty managing their care at home. This may result in readmission to the hospital as their diseases progress or they experience other declines in health status. A transitional care model was developed and tested by an interdisciplinary team to help bridge the gaps between hospital and home care. Advance Practice Nurses specializing in geriatrics provided follow-up contact in the home. This approach improved health outcomes for older people with heart failure while providing significant cost savings.
- ◇ **CERTAIN PAIN RELIEVERS FOR ACUTE POST-OPERATIVE PAIN ARE MORE EFFECTIVE IN WOMEN** than in men. A study of pain relief subsequent to removal of bony-impacted wisdom teeth found that women obtained satisfactory relief from a seldom-used class of drugs – kappa-opioids – even though they reported a higher intensity of pain than men. In addition, relief in women lasted longer than in men. Men reported little benefit from these drugs, and pain actually increased at some dosages. More recent studies have shown that naloxone, a drug used to reverse the effects of narcotic drugs, eliminates the gender differences in response to kappa-opioid analgesia, and enhances pain relief in both women and men. In follow-up “bedside to bench” studies, the investigators studied pain sensations at the molecular level in rat models, looking at gender and age, nerve cell receptors, inflammation levels, the relationship of sex hormone levels to the effectiveness of pain relief, and biochemical factors that cause pain to intensify. This body of work has revealed the importance of considering gender in providing analgesics for pain relief and identified new directions for research on the experience and relief of pain.

- ◇ Laboratory studies have shed light on the **RELATIONSHIP BETWEEN PAIN AND RECOVERING FROM SURGERY**. Using a rat lung tumor model, investigators demonstrated that rats provided with effective pain relief during and after surgery developed fewer lung tumors. This work indicates that proper analgesia may help maintain immune function to reduce surgery-induced metastases. It suggests important new directions for studying surgical pain and metastasis in humans and adds to a growing body of knowledge about the lasting effects of pain management before, during, and immediately following surgery.



- ◇ **DISADVANTAGED YOUNG MOTHERS** face a wide range of social and financial difficulties in raising their children. One study showed that these mothers can benefit from home visits by registered nurses who tailor their interventions to the needs of each family. Interventions included help with parenting skills, linkage of mothers to community services, and improvement of support systems. The initial results, confirming those of an earlier study, included significantly lower incidence of pregnancy-induced high blood pressure, better timing of subsequent pregnancies, and substantial reduction of childhood injuries. A follow-

up study found that when the children reached six years of age (four years after the first study was concluded), they had higher IQ and language scores and fewer behavioral problems compared to controls. The mothers showed lasting improvement on several indices of stability in finances and relationships.

- ◇ Pressure ulcers are areas of skin breakdown that may occur when an **IMMOBILE OR BEDRIDDEN PATIENT** remains in one position for too long. They can compromise patient health and increase the complexity and cost of care. The Braden Scale for Predicting Pressure Sore Risk<sup>®</sup> was developed to identify patients at higher risk for pressure ulcers within a few days of admission to a health care institution so that early preventive action can be taken. A nurse-led multi-site study validated the efficacy of the scale for predicting development of future pressure ulcers, and determined that use of the scale within 48 to 72 hours after admission improved prediction accuracy and allowed nurses to initiate timely prevention strategies. These findings have been incorporated into the Clinical Practice Guidelines for practitioners published by the Agency for Healthcare Research and Quality.



- ◇ **HOSPITAL RESTRUCTURING AND A GROWING NURSING SHORTAGE** are among the factors most likely to affect patient care in the next 20 years. Studies have confirmed that nurse staffing levels and educational attainment of nurses in hospitals have direct and measurable effects on patients' health outcomes. Other research has shown that hospital restructuring, which may cause or exacerbate job dissatisfaction and burnout, is likely to affect both the numbers and the educational makeup of the hospital nursing workforce. Finally, studies suggest that working conditions are more of an issue than wages in determining job satisfaction among nurses. This body of work underscores the importance of considering scientific evidence in hospital restructuring and staffing.

- ◇ **THE INCREASED INCIDENCE OF HIV INFECTION AND AIDS AMONG YOUNG PEOPLE FROM 13 TO 20 YEARS OF AGE** points to the need for HIV/AIDS prevention strategies specifically designed for adolescents and young adults. An intervention targeted toward young minority women was shown to be more effective when it included attention to cultural issues and incorporated skills development programs. In a related and important finding, group sessions were more effective than working with individuals.
- ◇ **THE AMOUNT AND QUALITY OF A MOTHER'S SLEEP IN LATE PREGNANCY** may have a significant effect on both the duration of labor and the likelihood of cesarean delivery. Controlling for infant birth weight, investigators found that insufficient sleep (less than 6 hours a night) and severely disrupted sleep are both associated with prolonged labor. Women with insufficient sleep were 4.5 times more likely to have a cesarean delivery, and those whose sleep was severely disrupted had 5.2 times as many cesareans. These results highlight the importance of adequate sleep during pregnancy, and suggest a need for care providers to emphasize the importance of good sleeping habits to their pregnant patients.
- ◇ **INFANTS BORN WITH LOW BIRTH WEIGHT (LBW)** and hospitalized in a newborn intensive care unit are very susceptible to infections, and Gram-negative organisms are an increasing source of these infections. A recent study showed that the main risk factors associated with Gram-negative infections were birth weight, duration of the use of a central venous catheter, use of nasal continuous positive airway pressure (nasal CPAP), use of gastric H2 blocker medications, the need for a surgical procedure, and pathology of the gastrointestinal (GI) tract. H2 blockers, nasal CPAP, and GI pathology may all weaken the GI epithelium, affecting the translocation of Gram-negative organisms across the GI tract. These findings indicate the need to recognize the diverse causes of Gram-negative infections among LBW infants and develop appropriate, tailored preventive strategies.



- ◇ **WOMEN WHO HAVE SUFFERED A HEART ATTACK** have a higher rate of morbidity and mortality than men. A recent study found that women who had suffered a heart attack were less likely than men to make changes to their diet or exercise routines – changes that could prevent future heart attacks. The investigators suggested that women may be less likely than men to attribute the cause of their heart attack to poor diet and exercise. The possibility that men and women differ in what they believe caused their illness may influence their behavior once they have recovered, suggesting a need for tailored approaches to treatment and education.



- ◇ **CAREGIVERS OF ELDERLY PEOPLE** tend to experience a high degree of burden and stress. A survey of more than 2,000 female caregivers of elderly veterans with dementia found that almost one-third of the women had significant depressive symptoms. White caregivers were almost twice as likely to be depressed as African-American caregivers. White caregivers who were depressed were also twice as likely as their African-American counterparts to be taking antidepressants. This finding suggests that caregivers of dementia patients

should receive routine screening and treatment for depression, and that better efforts are needed to make African-American caregivers aware of the potential benefits of antidepressant therapy.

- ◇ **MANY WOMEN REPORT MOOD CHANGES** related to menopause. Scientists followed 70 postmenopausal women, one-third of whom were receiving hormone replacement therapy (HRT), to study the relationship between depressive symptoms and cholesterol and lipid levels. The average depression score for the women was low, and was not related to receiving HRT. However, for women not on HRT, increased depressive symptoms were related to lower levels of cholesterol. These findings indicate that HRT may serve to buffer the effects of low cholesterol levels on depression in otherwise healthy postmenopausal women.

