



Robert Wood Johnson Foundation

## INTERDISCIPLINARY RESEARCH THAT DEMONSTRATES THE ROLE OF NURSES IN IMPROVING THE QUALITY OF PATIENT CARE



## The Interdisciplinary Nursing Quality Research Initiative (INQRI)

## From the Directors

**H**ow do we demonstrate and capitalize on the causal linkages between what nurses do and a better patient care experience as well as on improvements in patients' health and quality of life, while wisely using our precious and finite resources?

That is the question that we have been examining through the *Robert Wood Johnson Foundation Interdisciplinary Nursing Quality Research Initiative* (INQRI). In the course of this program, interdisciplinary research teams have conducted 40 studies applying the most rigorous standards to examine nurses' practices, processes and work environments and determine the impact nurses have on the quality of patient care. These studies comprise the first effort of this size and scope to identify both the ways in which nurses can improve the quality of patient care and nursing's unique contributions to patients, families and communities across a diverse range of settings. INQRI has created a community of scholars committed to advancing interdisciplinary research to continue to build that knowledge.

The interdisciplinary nature of these teams ensured that diverse perspectives and methodological techniques were applied to answer questions about the causal linkages between nursing care and patient outcomes. Each team was co-led by a scholar from nursing and one from another field including social science, engineering and a variety of health care professions. Teams also included young and more seasoned scholars. Ultimately, their efforts were intended to provide information that would reduce medical errors, improve the quality of patient care and identify solutions to help health systems and health care providers ensure the best possible health outcomes. By having nursing scholars partner with scholars from other disciplines to not only implement each study, but also to conceptualize them from the initial study design, INQRI has advanced and contributed rigorous interdisciplinary evidence.

From its inception, INQRI has been a truly collaborative program and that is reflected in its leadership. The INQRI National Advisory

Committee is made up of experts from a variety of fields. The program is led by a nurse scholar and two health care economists. All are committed to improving health and health care for all Americans, and to ensuring that nurses—as the largest group of health care professionals—have a recognized central role in that effort.

We determined that INQRI should do more than provide a base of research, so the program sought proposals focused on understanding how findings could be translated into action in order to have a timely impact on patient care and outcomes. Projects were selected that had the potential to reach specific groups of decision makers and leaders who are responsible for making change, including implementing new measures or standards of care and adopting new evidence-based practices.

Brought together once a year at the INQRI annual meeting, the researchers shared methods, findings and new research questions that arose in the course of their studies. Their colleagues, the National Advisory Committee and invited guests—including leaders and experts in health care and other fields—provided feedback, advice and encouragement to enhance their work. At the meetings and in other settings, these diverse and important stakeholders also helped the research teams develop key messages to effectively share what was learned.

This book highlights the groundbreaking and important work of the INQRI grantees. It is an important reminder of the program's early impact, and we hope that it also communicates the range of contributions made by INQRI teams that live on in health care settings across the country and will continue to inform and enhance nursing's contributions and unparalleled impact on the health care of people in the United States.

Mary D. Naylor, PhD, RN, FAAN, *Program Director*

Mark V. Pauly, PhD, *Program Co-Director*

Lori Melichar, PhD, *Senior Program Officer*



### **Nursing Intervention to Facilitate Patient Activation for Improved Pain Self-Management**

*University of California, Davis*

This interdisciplinary team, with scholars from nursing, psychology, surgery, statistics and other fields, evaluated a counseling intervention to promote successful pain self-management in patients after spine surgery. The team measured patients' pain, function and depression, and compared controls with the intervention group. Pain counseling was successfully integrated into a busy specialty surgery practice during this study; the team gained valuable perspective on the system level issues involved. The team was led by Deborah Ward, PhD, RN, FAAN; Debra Fishman, PsyD, a psychologist; and Richard Wanlass, PhD, a clinical psychologist in physical medicine and rehabilitation.





**Empowering Home Care Nurses to Efficiently Resolve Medication Discrepancies**

*Washington State University*

This team used information technology to help home care nurses more efficiently and effectively identify and resolve medication discrepancies as patients transitioned from the hospital to home. These discrepancies occur when a patient's discharge instructions regarding their medication differ from the medications the patient actually took once arriving home. Medication discrepancies were found for virtually all classes of medications, including those considered high risk, such as antidiabetic medications, anticoagulants and narcotics. The intervention group participants had fewer emergency department visits during the first 30 days after the index hospitalization. These findings demonstrate both the importance and the complexity of medication information transfer during care transitions from hospital to home. This interdisciplinary team was led by Cynthia Corbett, PhD and Stephen Setter, PharmD, DVM, CDE, CGP, FACSP.

Nurses represent the single largest group of health professionals who deliver hospital care, yet, until recently, little was known about what they can do to ensure that care is safe, beneficial, patient-centered, timely, efficient and equitable.

Until recently, there was limited rigorous research demonstrating causal linkages between nursing care and patient outcomes, and without that, many policies and programs were based on the unproven assumption that developing effective performance measurement systems would enable health care stakeholders to better understand and monitor the degree to which nursing care influenced patient safety and health care quality.

In 2005, the Robert Wood Johnson Foundation (RWJF) created the *Interdisciplinary Nursing Quality Research Initiative* (INQRI) to address this gap in knowledge and identify the ways in which nurses affect the quality of care patients receive and the ways in which they can improve patient care and outcomes. Some INQRI projects have produced evidence that better nursing improves quality of care by reducing medical errors and identifying measures, processes and protocols that help health systems and health professionals ensure the best patient outcomes possible. Findings from INQRI projects also help hospital administrators, policy-makers and other key health care decision makers understand what drives better nursing care and the environmental changes necessary to support nursing's efforts to achieve better patient care and outcomes.

#### **Interdisciplinary Research Teams**

As its name suggests, INQRI strategically focused on supporting interdisciplinary teams that proposed diverse, innovative research initiatives designed to establish the link between nursing and high quality care. INQRI's leadership is also an interprofessional team: Mary D. Naylor, PhD, RN, FAAN, a nurse and health services researcher, and Mark V. Pauly, PhD, a health care economist, direct the program at the University of Pennsylvania, in partnership with Lori Melichar, PhD, and her colleagues at RWJF. Believing that interdisciplinary collaboration enhances the production of rigorous science, the INQRI program supported research teams that applied diverse perspectives and methodological techniques to answer questions without sacrificing the relevance and insights provided by clinicians. This interprofessional approach was extended also to the group of stakeholders selected to advise INQRI grantees and program leaders. By involving key stakeholders in the conduct of research from the outset, INQRI leaders hoped to build strong partnerships with potential end-users of the research findings.



**Impact of Medical-Surgical Acute Care Microsystem Nurse Characteristics and Practices on Patient Outcomes**

*University of California, San Francisco*

This team examined individual and collective effects of unit level nurse workload, staff nurse characteristics and selected risk assessment and preventive intervention processes of care on variance in nursing sensitive outcomes of acute care medical-surgical units. Interestingly, they found that falls and falls with injury were predicted by patient characteristics and clinical process variables, but not by nurse expertise. However, hospital acquired pressure ulcer prevalence was predicted by a combination of all elements in the model, including nurse expertise. Finally, the team also found that unit and patient characteristics and workload could predict medication practice errors and that workload and practice errors predicted medication outcome errors. These findings can guide hospitals in efforts to improve staffing effectiveness and patient safety, reducing medication administration errors and understanding prevalence of facility acquired pressure ulcers. This interdisciplinary team was led by Nancy E. Donaldson, RN, DNSc, FAAN and Carolyn Aydin, PhD.



### **Implementation of a Risk Specific Fall Prevention Bundle to Reduce Falls in Hospitals**

*University of Michigan*

Accidental falls are the most common reported patient safety incident in hospitals with rates from 2.9 to 13 per 1,000 patient days. Up to 30 percent of falls result in injury including death. Interventions targeted to patients' fall risk factors are necessary to reduce falls but few hospital fall prevention programs have implemented such an approach. The purpose of this 18 month study was to implement fall prevention interventions targeted to patient risk factors and evaluate use of these practices and their impact on reducing falls and fall related injuries. This interdisciplinary team was led by Marita Tittler, PhD and Paul Conlon, PharmD, JD.





### Grantees

In 2006, the first round of INQRI-funded interdisciplinary teams began their research studies. These nine projects addressed three major areas: (1) investigating the link between the work of nurses and the quality of care provided in hospitals; (2) producing and validating measures that capture nurses' contributions to quality care in hospitals; and (3) evaluating the impact of innovative nurse-led initiatives on patient outcomes. Each subsequent year and with each round of grantees, INQRI sought to build upon the first cohort's body of research. The program also increased the scope of research from that conducted in acute care settings to considering projects that cut across a diverse range of health care settings.

Program leaders recognized that the work of the first round of grantees could provide the building blocks for several nursing quality improvement strategies. With that in mind, the program leadership invested in research that would examine the processes that could improve nursing-sensitive measures, and provide deeper understanding of the major care processes delivered by nurses and their impact on the quality of patient outcomes. INQRI funded 12 additional teams in 2007 to investigate such topics as nurses' roles in: avoiding readmissions; addressing patients' risk for falls; medication reconciliation; and other key processes of care.

In its third year, the program further expanded its scope to coincide with the national health care agenda to deliver high quality patient care while increasing value and reducing waste. Specifically, the call for proposals sought projects that would clarify the role of nurses on interdisciplinary health care teams and the effect of work environments on the efficiency of nursing care. INQRI awarded grants to eight teams in 2008,

including studies that: tested the effectiveness of a nurse-physician co-leadership model in treating heart failure; examined the effects of nurse staffing and skill mix on patient outcomes in long term care; and investigated the effect of off-peak (i.e. night and weekend) shifts on nurses' work, among other important topics.

The fourth call for proposals built on the question of efficiency and delivering care cost-effectively by examining the value of nursing in achieving efficient, high quality patient care. INQRI sought proposals that would investigate the value of nurses in generating and leading innovations, preventing medical errors and other complications, and community-based quality improvement efforts. Among the five grantees selected for funding in 2009 were teams that: examined nursing's contributions to quality palliative care; initiated an interdisciplinary team approach to reducing pressure ulcers; and conducted an intervention with visiting nurses to reduce the risk of type 2 diabetes in at-risk adults.

INQRI's final grant solicitation in 2010 sought to build on the research conducted in the first four years of the program. Instead of identifying new topic areas, the call for proposals addressed another core dimension of INQRI's mission, the translation of knowledge to improve nursing care and patient outcomes. In this final phase, INQRI sought proposals focused on projects that would promote ways to implement successful evidence-based strategies and practices. The six projects selected in 2010 included: the creation of a nurse manager development program to increase patient safety; the dissemination and implementation of evidence-based methods to measure and improve pain outcomes; and the implementation of a risk-specific fall prevention intervention to reduce falls in hospitals.





**Implementation and Dissemination of an Interdisciplinary Nurse-Led Plan to Manage Delirium in Critically Ill Adults**

*University of Nebraska*

Fully two-thirds of intensive care unit patients develop delirium, which is associated with longer stays, billions of dollars in costs globally, and three-fold excess mortality at six months. Over one-half of intensive care unit survivors suffer a functionally debilitating dementia-like illness, which appears related to delirium duration. The main goal of this project was to implement, analyze and disseminate an evidence-based, nurse-led, interprofessional, multi-component program focused on improving the care and outcomes of critically ill adults. The study focused on applying a program of delirium screening, prevention and treatment developed at Vanderbilt University. This interdisciplinary team was led by Michele Balas, PhD and William Burke, MD.





**Rural Hospital Quality Collaborative on Evidence-Based Nursing**

*University of Maryland, Baltimore*

Researchers at the University of Maryland and Johns Hopkins University conducted a study which identified the linkages between processes of nursing care and the quality of patient outcomes, while also addressing the pressing need for mentorship in implementing evidence-based heart failure care in rural hospitals. This study is one of the first to focus on linkages between rural nursing and patient outcomes, and has increased the engagement of nurses in 23 rural hospitals in improvements in heart failure care. Qualitative evidence suggests profound changes in the uptake of evidence and the formation of multidisciplinary teams. This interdisciplinary team was led by Robin Newhouse, PhD, RN, NEA-BC, FAAN and Laura Morlock, PhD.



### Using the Evidence

INQRI research provides a robust body of results that can be shared with policy-makers, hospital administrators and others who determine how nursing resources will be distributed to improve the quality and outcomes of patient care. In addition to providing communications assistance to help researchers disseminate their findings to a broad and diverse audience, the INQRI leadership team produced syntheses that placed the work of INQRI grantees in the context of similar research by others in the nursing and other health care fields. The influence of INQRI grantees extends beyond the life of each individual grant. INQRI researchers have implemented systems changes, made recommendations for improving care, and are making a lasting impact on how care is delivered. INQRI program leaders continue to support those researchers in sharing and promoting their findings with decision makers and stakeholders nationwide.

### Conclusion

For 40 years the Robert Wood Johnson Foundation has brought experience, commitment, and a rigorous, balanced approach to the problems that affect the health and health care of all Americans. INQRI continued this tradition of success and advanced the science of nursing through rigorous, interdisciplinary research focused on new methods to facilitate and advance efforts to improve care for patients. INQRI also fostered early engagement of potential end-users to shape each initiative and ongoing collaboration with multiple stakeholders to promote timely use of important findings. Finally, INQRI was and remains committed to building the next generation of scholars who will pursue this important line of inquiry and build on the great foundation provided by 40 teams.



**SPEACS 2: Improving Patient Communication and Quality Outcomes in the ICU**

*University of Pittsburgh*

This project examined the value of a nurse-generated and nurse-led innovation by testing the impact of a computer-based nurse communication training and materials program (SPEACS-2) on intensive care unit patient care outcomes: nursing care quality (coma-free days, physical restraint use, pain symptom management, pressure ulcers, patient/family satisfaction with communication), clinical outcomes (ventilator-free days, ICU/hospital days discharge disposition) and cost. The interdisciplinary research team included nurses, physicians, speech-language pathologists and biostatisticians co-led by Mary Beth Happ, PhD, RN, a nurse researcher, and Amber Barnato, MD, MPH, a physician and health policy researcher.



### **A Diabetes Prevention Program in the Community**

*Yale University*

This team conducted a randomized clinical trial to reduce the risk of type 2 diabetes in at-risk adults with a diabetes prevention program provided by visiting nurses in subsidized housing units. They modified a research-based diabetes prevention program; evaluated the preliminary effects of the modified program provided by visiting nurses; and explored the reach, adoption, implementation and cost of a diabetes prevention program delivered by visiting nurses to residents in subsidized housing units. The interdisciplinary team was led by Robin Whittemore, PhD, a nurse scholar, and Alana Rosenberg, MPH, a scholar in public health.





**Quality of Pediatric Nursing Care from the Children's Perspective**

*Columbus Children's Hospital*

This team identified hospitalized children's perceptions of the linkages between the quality of nursing care and outcomes. This study identified the nursing care processes and outcomes that matter most to children during their hospitalization, and estimated the extent to which disparities exist in the quality of their care and outcomes. The results of this study have value in themselves, but also provide valid content for new age-appropriate patient satisfaction scales for hospitalized children. This interdisciplinary team was led by Nancy Ryan-Wenger, PhD, RN, CPNP, FAAN, and William Gardner, PhD.

# Grantees

## Grants Awarded in 2006

- **Linking Blood Stream Infection Rates to Intensive Care**  
Johns Hopkins University
- **Nurse-Sensitive Measurement of Hospital Care Coordination**  
Emory University
- **Improving the NQF Failure to Rescue Metric**  
Mayo Clinic
- **Quality Care on Acute Inpatient Units**  
University of California
- **Developing and Testing Nursing Quality Measures with Consumers and Patients**  
Baruch College
- **Measuring Nursing Care Quality Related to Pain Management**  
University of Utah
- **Validating NQF Nursing-Sensitive Performance Measures**  
University of Pennsylvania
- **Lessons Learned from State Roll-Out of the NQF Nursing Sensitive Measures**  
Massachusetts Hospital Research and Education Association, Inc.
- **The Nursing Ambulatory to Hospital Transitions (NAHT) Program**  
Massachusetts General Hospital

## Grants Awarded in 2007

- **Translating Fall Risk Status into Interventions to Prevent Patient Falls**  
Brigham & Women's Hospital
- **Rural Hospital Quality Collaborative on Evidence-Based Nursing**  
University of Maryland, Baltimore
- **Nursing Workforce Impact on Performance Improvement in the CMS/Premier Hospital Quality Incentive Demonstration Project [HQID]**  
University of Minnesota
- **Quality of Pediatric Nursing Care from the Children's Perspective**  
Columbus Children's Hospital
- **Quality and Cost Outcomes of Hospital Supplemental Nurse Staffing**  
University of Rochester
- **Examining the Impact of Nursing Structures and Processes on Medication Errors**  
Rutgers University

- **A Quality and Cost Analysis of Nurse Practice Predictors of Readiness for Hospital Discharge and Post-Discharge Outcomes**  
Marquette University
- **Linking Processes of Nursing Care and Patient Safety Outcomes: An Analysis of the Cause and Effect of Safe Practice**  
Medical University of South Carolina
- **Acuity-Adjusted Staffing, Nurse Practice Environments and NICU Outcomes**  
University of Pennsylvania
- **Nursing Care Quality in Acute Care Hospitals: New Linkages to Patient Outcomes**  
University of California
- **Impact of System-Centered Factors and Processes of Nursing Care on Fall Prevalence and Injuries from Falls**  
University of Iowa
- **Nursing-Pharmacy Collaboration on Medication Reconciliation: A Novel Approach to Information Management**  
Johns Hopkins Hospital

## Grants Awarded in 2008

- **The Impacts of Nurse Staffing, Skill Mix and Experience on Quality and Costs in Long-Term Care**  
Palo Alto Institute for Research and Education
- **The Effect of Off-Peak Hospital Environments on Nurses' Work: An Institutional Ethnography**  
Midwestern State University
- **Impact of Medical-Surgical Acute Care Microsystem Nurse Characteristics and Practices on Patient Outcomes**  
University of California, San Francisco
- **The Res-Care-AL Intervention Study**  
University of Maryland, Baltimore
- **Multidisciplinary Organization and Outcomes for Chronic Heart Failure Patients in the VA**  
University of Minnesota
- **The Effects of Nurse Presenteeism on Quality of Care and Patient Safety**  
University of North Carolina, Greensboro
- **Small Troubles, Adaptive Responses [STAR]: Fostering a Quality Culture in Nursing**  
University of Texas Health Science Center, San Antonio

- **Empowering Home Care Nurses to Efficiently Resolve Medication Discrepancies**  
Washington State University

## Grants Awarded in 2009

- **Nursing's Specific Contributions to Quality Palliative Care within the Context of Interdisciplinary Intensive Care Practice**  
Oregon Health & Science University
- **Nursing Intervention to Facilitate Patient Activation for Improved Pain Self-Management**  
University of California, Davis
- **Interdisciplinary Mobility Team Approach to Reduction of Facility-Acquired Pressure Ulcers**  
University of Cincinnati
- **SPEACS 2: Improving Patient Communication and Quality Outcomes in the ICU**  
University of Pittsburgh
- **A Diabetes Prevention Program in the Community**  
Yale University

## Grants Awarded in 2010

- **Creation of a Nurse Manager Development Program to Increase Patient Safety**  
Rutgers University
- **Nurse-Led Intervention to Improve Screening and Treatment for Substance Abuse: An RCT of Hospitals**  
University of Maryland, Baltimore
- **Implementation of a Risk Specific Fall Prevention Bundle to Reduce Falls in Hospitals**  
University of Michigan
- **Implementation and Dissemination of an Interdisciplinary Nurse-Led Plan to Manage Delirium in Critically Ill Adults**  
University of Nebraska
- **Translation of a Transitional Care Nursing Intervention for People with Serious Mental Illness**  
University of Pennsylvania
- **Dissemination and Implementation of Evidence-Based Methods to Measure and Improve Pain Outcomes**  
University of Utah

### **About the Robert Wood Johnson Foundation**

The Robert Wood Johnson Foundation focuses on the pressing health and health care issues facing our country. As the nation's largest philanthropy devoted exclusively to improving the health and health care of all Americans, we work with a diverse group of organizations and individuals to identify solutions and achieve comprehensive, meaningful and timely change.

For 40 years we've brought experience, commitment and a rigorous, balanced approach to the problems that affect the health and health care of those we serve. When it comes to helping Americans lead healthier lives and get the care they need, we expect to make a difference in your lifetime.

For more information visit [www.rwjf.org](http://www.rwjf.org).

### **About INQRI**

The primary goal of the Interdisciplinary Nursing Quality Research Initiative (INQRI) is to generate, disseminate and translate research to understand how nurses contribute to and can improve the quality of patient care. The program, led by Mary Naylor, PhD, RN, FAAN, and Mark Pauly, PhD, of the University of Pennsylvania, in partnership with Lori Melichar, PhD, and her colleagues at the Robert Wood Johnson Foundation, supports interdisciplinary teams of nurse scholars and scholars from other disciplines to address the gaps in knowledge about the relationship between nursing and health care quality.

For more information visit [www.inqri.org](http://www.inqri.org).

