

# FACT SHEET

## AHRQ Research Relevant to Understanding the Impact of Working Conditions on Patient Safety

Agency for Healthcare Research and Quality • 2101 East Jefferson Street • Rockville, MD 20852



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AHRQ sponsors and conducts research that provides evidence-based information on health care out-comes; quality; and cost, use, and access. The information helps health care decisionmakers—patients and clinicians, health system leaders, and policymakers—make more informed decisions and improve the quality of health care services.



U.S. Department of Health  
and Human Services  
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### Background

Recent research initiatives from the Agency for Healthcare Research and Quality (AHRQ) have emphasized expanding the knowledge base on how the quality of the health care workplace affects the quality of health care provided—particularly how medical errors occur and how they can be addressed within the health care system. In 1999 and 2000, AHRQ and other Federal agencies of the Quality Interagency Coordination Task Force sponsored meetings on enhancing working conditions and patient safety in health care settings. Among the gaps in knowledge identified in these two conferences were:

- The need for an evidence-based understanding of the impact of specific improvements in the health care workplace on quality of care.
- The effect of staffing levels and organization of work on patient outcomes and health personnel, including those in outpatient care and home health settings.
- The effect of incentives and alternative work organization strategies to promote health care

worker retention and adoption of new care methods to deliver high quality care.

### AHRQ's Commitment to Research on Working Conditions

In fiscal year 2001, AHRQ received \$10 million to support initiatives targeting health care workforce and quality improvements. Since that time, AHRQ has funded several major projects designed to examine the effects of working conditions on health care workers' ability to provide safe, high-quality care. These projects are intended to identify, characterize, and directly measure the effect of the health care work environment on the safety and quality of care provided by health care workers. AHRQ's work is critical to the larger initiative of the U.S. Department of Health and Human Services to improve patient safety and the quality of health care in the Nation.

### Current Projects

AHRQ's portfolio of working conditions research is part of the agency's ongoing efforts to develop evidence-based information aimed at improving the quality of the U.S.



health care system. Projects and activities comprising AHRQ's working conditions activities are summarized below.

### **Impact of Nurses' Workload and Working Conditions**

**Impacts of unit-level nurse workload on patient safety.** This project is examining the associations between the structure of hospital nurse staffing, patient turnover, and indicators of patient outcomes and safety (e.g., falls, pressure ulcers, restraint prevalence, and significant clinical events). The hospital nurse staffing elements under study include hours of direct care per patient day, skill mix of nurse caregivers, percent of contracted or agency staff, ratio of required to actual hours of care, and years of registered nurse post-licensure experience. (Principal Investigator: Nancy E. Donaldson, University of California-San Francisco; Grant No. HS11954).

**Work environment for nurses and patient safety.** Investigators will identify key aspects of the work environment for nurses—including extended hours and workload—that likely have an impact on patient safety, and identify potential improvements in health care working conditions that would likely result in enhancements in patient safety. (Principal Investigator: Ann Page, Institute of Medicine; Contract No. 282-99-0045).

**Hospital nurses' working conditions and patient outcomes.** This project is examining the relationship between nursing care delivery models, job strain, risk of injury, and hospital's use of overtime and contract nurses and the occurrence of adverse patient outcomes.

(Principal Investigator: Jack Needleman, Harvard School of Public Health; Grant No. HS11988).

**Nurses' working conditions: effects on medication safety.** The aim of this study is to describe how nurses' working conditions, workload (e.g., shift length and patient assignment), actions taken (e.g., adherence to standards and actions that prevent adverse drug effects), and organizational variables affecting nurses are related to the safety and quality of care they provide. Working conditions under study include physical environment, safety climate, automation, and staffing levels. (Principal Investigator: Ginnette A. Pepper, University of Colorado Health Sciences Center; Grant No. HS11966).

**The relation of hospital workload to patient safety.** This study is examining the association between hospital activity/workload and rates of adverse drug events to assess whether the workload should be limited or the processes during times of high workload pressure should be reengineered to improve patient safety. Investigators are also developing new methods for identifying adverse events using electronic medical records. (Principal Investigator: Joel S. Weissman, Massachusetts General Hospital; Grant No. HS12035).

### **Effects of Fatigue and Stress**

**Impacts of alcohol and fatigue on paramedic ALS skills.** This project is assessing whether routine levels of fatigue and alcohol hangover among certified practicing emergency medical technician-paramedics (EMT-Ps) impair the judgment and/or performance of

the EMT-Ps in treating patients who need resuscitation, stabilization, or other advanced life support (ALS) services. (Principal Investigator: Les Becker, Pacific Institute for Research and Evaluation; Grant No. HS11750).

**Effects of extended work hours on intensive care unit patient safety.**

Researchers are investigating the effects of fatigue experienced by hospital residents who work on-call shifts of over 30 hours vs. residents who work no more than 16 consecutive hours on the incidence of medical error rates in intensive care units (ICUs). (Principal Investigator: Charles A. Czeisler, Brigham and Women's Hospital, Boston; Grant No. HS12032).

**Work environment: effects on quality of health care.** This project is examining how the work environment affects medical errors and "near misses" in the hospital setting as well as how an intervention based on human factors principles affects quality of care.

Among the work environment variables under study are staffing, employee satisfaction, employee perception of safety culture, work organization, fatigue, work injuries, body substance exposures. (Principal Investigator: Bradley Evanoff, Washington University School of Medicine; Grant No. HS11983).

**Minimizing error, maximizing outcome: the physician workforce study II.** This study is determining the role of physicians as mediators in the effect of the health care workplace environment on the quality of care as reflected in disease outcomes and medical errors, assessing the following key mediators: physician stress, satisfaction, and burnout. (Principal

Investigator: Mark Linzer, University of Wisconsin School of Medicine; Grant No. HS11955).

**Working conditions of surgery residents and quality of care.** This study is investigating the relationship between resident stress factors (e.g., working hours, indebtedness, family issues and support services, the balance of service vs. education) and the occurrence of preventable adverse events. (Principal Investigator: Robert Mentzer, Jr., University of Kentucky; Grant No. HS12029).

**Staff nurse fatigue and patient safety.**

This project is assessing how nurses' per-shift length of more than 8 hours affects patient safety and whether a fatigue countermeasures program for nurses that involves minimizing the effects of fatigue, sleep loss, and circadian rhythm disruption decreases errors. (Principal Investigator: Ann E. Rogers, University of Pennsylvania; Grant No. HS11963).

**Working Conditions in Nursing Homes**

**Task design, motivation, and nursing home quality.** This study is investigating the task design of nursing care jobs and job satisfaction among nurse aides, licensed practical nurses, and registered nurses to assess how job design characteristics are related to employee job satisfaction and care quality. (Principal Investigator: Victoria Parker, Boston University; Grant No. HS12031).

**Organization change to improve nursing home environment.** This study is assessing staff outcomes (e.g., injury rate, retention, and days off work), job satisfaction, and physical

and emotional health to evaluate the impact of a global organizational intervention aimed at enhancing the ability and motivation of nursing home employees to improve residents' care and safety. (Principal Investigator: Jules Rosen, University of Pennsylvania Medical Center; Grant No. HS11976).

**Nursing home working conditions and quality of care.**

This study is examining the relationship between working conditions (e.g., culture and environment, staff interaction, and staffing) and organizational performance measures. These measures include Minimum Data Set Quality Indicators, State survey citations and complaints filed with the State, and perceived effectiveness. (Principal Investigator: Jill Scott, University of Colorado Health Sciences Center; Grant No. HS12028).

**Reducing Adverse Events**

**Quality care and error reduction in rural hospitals.**

This project is assessing the organizational factors that influence rural health care providers through a 3-year multi-method intervention study to reduce errors by improving the identification and discussion of medical errors, near misses, and adverse events. (Principal Investigator: Ann Cook, University of Montana; Grant No. HS11930).

**Working conditions and adverse events in home health care.**

This project is examining the relationships among the organizational work place (with an emphasis on the team environment), the workforce, worker productivity, and preventable adverse events in the home health care setting. (Principal Investigator: Penny Feldman,

Visiting Nurse Service of New York; Grant No. HS11962).

**Making sure: an ethnographic study of health professionals' work.** This project is an ethnographic study of care practices of health professionals to explore the impact of changing working conditions on their ability to provide safe and effective patient care. (Principal Investigator: Paul Gorman, Oregon Health & Science University; Grant No. HS12003).

**Association of working conditions with prescribing errors in primary care settings.** This study is evaluating the association of rates of "risky prescribing events" with both structural and functional characteristics of the primary care practices of two managed care organizations. Events to be examined include prescribing of risky drug combinations, violations of black-box warnings, and failure to monitor with laboratory tests when indicated. (Principal Investigator: Douglas W. Roblin, Kaiser Permanente, Georgia; Contract No. 290-00-0015).

**Integrated delivery systems solutions for transferring medication data across patient care settings.** This study is investigating the implementation and diffusion of an information technology solution at a single integrated delivery site for the transmission of complete and accurate medication information across care settings. (Principal Investigator: Lucy A. Savitz, Research Triangle Institute; Contract No. 290-00-0018).

**Organizational Climate and Culture Collaborative clinical culture and quality of care.** This project is linking measures of organizational culture and

workforce characteristics with an extensive set of standardized, routinely collected measures of quality of care to assess the impact of workforce integration on practitioner satisfaction and morale. (Principal Investigator: Sheldon Greenfield, Tufts University; Grant No. HS11991).

**The effects of financial incentives in medical group practices and the work environment on the quality of care.**

This project is assessing the influence of physician financial incentives in medical group practices and physician work environment on clinical errors to determine if low-cost practices achieve that status at the expense of quality. (Principal Investigator: John Krlewski, University of Minnesota; Contract No. 290-00-0017).

**Outcomes of ICU working conditions.** Investigators are examining the effect of varied working conditions (e.g., workforce staffing and organizational climate) in ICUs on elderly patient safety outcomes and the safety of health care workers. Patient safety outcomes to be assessed are nosocomial infections, length of stay, mortality, and disposition at discharge; worker safety variables under study include musculoskeletal injuries, blood/body fluid exposure, sick days, and disability days. (Principal Investigator: Patricia Stone, Columbia University; Grant No. HS13114).

**Do organizational factors influence both patient and worker safety?** This project is assessing how staffing and other organizational parameters act as risk factors for injury for both patients and workers in acute and long-term care facilities. (Principal Investigator: Alison Trinkoff, University of Maryland at Baltimore; Grant No. HS11990).



### **The impact of nursing unit characteristics on outcomes.**

Researchers are assessing the impact of workplace factors on the safety and health outcomes of patients discharged from acute care nursing units. A simulation model of the best mix of nursing unit characteristics to achieve the highest level of patient outcomes in light of constant patient and hospital factors is also being developed. (Principal Investigator: Joyce Verran, University of Arizona; Grant No. HS11973).

**Organizations, work environment, and quality of care.** This multilevel project is studying the impact of organizational and work design factors on health care quality (both patient safety and satisfaction) through employee working conditions and employee health (mental and physical), fatigue, and satisfaction in community-based health clinics. (Principal Investigator: Nicholas Warren, University of Connecticut Health Center; Grant No. HS11969).

**Relationship of provider group characteristics to quality of care and medication errors in ambulatory care settings.** Researchers are assessing the effect of selected medical provider group characteristics (e.g., provider mix, rural/urban location, and financial arrangement with the health plan) on quality of care and patient safety in staff model and contracted network medical groups of two mixed model participating health maintenance organizations. (Co-Principal Investigators: Leif Solberg, HealthPartners, and Floyd Frost, Lovelace Respiratory Research Institute; Contract No. 290-00-0015).

### **Learning From Other Industries**

**Effect of health care working conditions on patient safety.** This Evidence-based Practice Center (EPC) project summarizes a systematic review of available published literature assessing the evidence of the link between working conditions and patient safety and quality of care using a wide range of published evidence from other disciplines, such as human factors research, social sciences, and aviation. (Principal Investigator: David Hickham, Oregon Health & Science University; EPC Project Director: Mark Helfand; Contract No. 290-97-0018).

### **For More Information**

For more information on AHRQ's projects related to the effects of working conditions on quality of care and patient safety, visit the AHRQ Web site ([www.ahrq.gov](http://www.ahrq.gov)) or contact:

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