



MIDWEST CENTER FOR OCCUPATIONAL HEALTH AND SAFETY

Research to Practice: Selected Examples from the MCOHS

More than 100 papers by faculty and/or students were published or accepted for publication in peer-reviewed scientific journals during the four-year period from July 1, 2002 to June 30, 2006. Although the time frame is too short to enable full evaluation of their impact, these papers have the potential to influence occupational health and safety practice. Below is a partial list of research projects likely to have an effect on occupational health and safety.



Reducing the Burden of Injuries On Agricultural Operations

Dr. Gerberich, and her team of co-investigators and students, leads major injury prevention studies that are the basis of regional research to practice efforts. These include surveillance studies of the incidence and consequences of, and risk factors for, agricultural and other injuries in Minnesota, Wisconsin, North and South Dakota and Nebraska. The study results and identification of intervention efforts will be translated to practice through collaboration with regional Agricultural Extension leaders who work directly with operators and communities. Dissemination has also been accomplished through at

least nine publications and 35 presentations.

Nanoparticle Exposure Assessment

Drs. Ramachandran, Raynor, and Alexander, PhD student Ji Young Park, and MPH student Deanna Brown are measuring the levels of engineered and incidental nanoparticles that workers may inhale at a variety of workplaces including research laboratories, food service establishments, and die casting facilities. Industrial hygienists will use this research to guide their plans for measuring worker exposures to airborne nanoparticles.

Performance of Isolation Rooms in Hospitals

Negative-pressure isolation rooms in hospitals are a critical way to protect staff, visitors, and other patients from airborne bacteria or viruses exhaled by infected patients. Dr. Raynor and MPH student Stefan Saravia evaluated the performance of more than 600 isolation rooms. Their findings are being used to guide improvements in hospital isolation capabilities as the facilities plan for emerging diseases such as the avian flu.

Quantitative Aid for Decision Making in Industrial Hygiene

Dr. Ramachandran, Dr. John Mulhausen, and Perry Logan, PhD student, have developed a method for incorporating professional judgment quantitatively into industrial hygiene decision making. They are conducting a NIOSH-funded study that looks at the accuracy and determinants of such decisions. Industrial hygienists from major companies such as 3M Company, Intel Corp., Pfizer Inc., Rohm and Haas, and Merck, and the US Department of Energy are participating in the study. Results to date indicate that targeted training dramatically improves decision-making accuracy.

Prevention and Control of Violence for Health Care Workers

Dr. McGovern and PhD student, Mary Findorff, and colleagues identified the incidence of occupational violence and associated risk factors for a Midwestern health care system involving more than 21,000 employees. Organizational changes instituted in association with study findings included: redesign of the violent incident reporting system to enhance surveillance systems, development of a manager fact sheet for responding to an assault or threat of harm, development of an employee fact sheet that included symptoms that workers might experience in response to violence, and a resource list for employees desiring health care services. Dr. McGovern was awarded the inaugural "Experienced Researcher Award" from the American Association of Occupational Health Nurses Foundation in association with this research. Dissemination has included publication of three papers and at least six presentations.



Violence Against Nurses: The Next Step

Identification of risk factors for work-related physical assault by Drs. Gerberich and Nachreiner, their colleagues, and students, are particularly important to application of relevant interventions. These risks include working in an environment with low lighting, not carrying cell phones or alarms, working in emergency and psychiatric departments and long-term care facilities, and increasing hours of patient contact. Dissemination to professionals has been accomplished through a minimum of seven publications and 16 presentations. Dr. Gerberich has also been invited to participate in a review of a major violence prevention intervention

protocol which considers results from this and related studies.



Preventing Violence Against Teachers

Dr. Gerberich, research team members, and students will provide translation of research data from the Minnesota study of "Violence Against Teachers: Etiology and Consequences," to practice throughout the school systems, in collaboration with their dedicated advisory board of teachers. Risk factor identification, which serves as a basis for development of relevant interventions, includes consideration of various environmental factors, assault deterrents, violence policies, and school financial resources. To date, initial results have been presented in three major professional meetings and audiences involving teachers.

Organizational Policy and Training On Work-Related Violence

Dr. Nachreiner's dissertation work investigated the association of training and organizational policies on work-related assaults among nurses. Her associated publications and presentations led to a consulting role on a grant application to develop a training intervention for hospital-based nurses on work-related violence. Her work also served as a model for evaluation of violence prevention training within the teacher population.

Vaginal Deliveries Associated with Better Physical Health for Employed Mothers

A longitudinal study of employed women's health during the first year after childbirth revealed vaginal (vs. cesarean) delivery to be most strongly associated with overall improved physical health at 5 weeks after childbirth. This

finding is important given that the cesarean delivery rate in the United States reached a record high of 29% in 2004. The study findings can help physicians counsel pregnant women about expectations for recovery and return to work after childbirth. The researchers, including Professors McGovern and Dowd and PhD students, Rada Dagher and Mira Grice, have four papers published or in revision, and there have been at least 20 presentations.

Connections Between Bioterrorism, the Food Supply, and Worker Health

ASH student Peri Periakaruppan (IH) was funded by the Minnesota Department of Agriculture to document worker health and safety exposures throughout the milk production and processing system and to look at critical “biosecurity” control points to protect milk from intentional contamination. Peri’s work included developing close working relationships with the majority of the state’s milk processors, who have been helpful in assisting the ASH program with field trips, site visits, and other opportunities for students. Peri’s work also complements strong educational program, outreach, and research relationships that have been established with state and federal officials including the US Department of Agriculture, the Minnesota Department of Agriculture, the Minnesota Board of Animal Health, and the Minnesota Department of Health.



Methamphetamine Exposures in Former Clandestine Laboratories

Barns, storage sheds, and abandoned farm houses have become targets for clandestine methamphetamine labs in rural areas because they provide privacy and easy access to anhydrous ammonia. Working

cooperatively with the Minnesota Department of Health and the Minnesota Pollution Control Agency, Dr. Raynor and MS student Tricia Carmody developed and tested methods for measuring levels of methamphetamine vapor and aerosol in former clandestine meth labs. These methods will allow for a better assessment of the hazards remediation workers and new residents face in a former lab.



Past Work on Hmong Agricultural Safety and Health Leads to Global Health Research, Education and Outreach

ASH students Penny Bartz (2005) and Ruth Rasmussen (2002) have worked with faculty John Shutske and Michele Schermann for the past five years on research related to Asian immigrant agricultural worker and family safety. This past work has directly led to current efforts addressing the control of occupational health exposures from H5N1 Avian Influenza in Vietnam, Thailand, and in communities throughout the U.S. Michele Schermann serves as an investigator on a large project funded in part by USAID examining health education and agricultural production-related barriers related to avian influenza control in Vietnam. John Shutske and Pete Raynor (of IH) are co-investigators on a newly funded CDC center on zoonotic infection and will be working with future ERC students on issues of PPE for agricultural workers in swine and poultry facilities, bird cullers, and public health officials as well as members of the public in Thailand.

Pesticide Exposures to Farmers and Their Families

Drs. Alexander and Baker and a team of researchers evaluated how much pesticide exposure occurs to farm family members when chemicals are used in real-world scenarios. The study identified pathways of exposure to the farmer, spouse, and children age 4-17, and examined how methods of exposure assessment can be improved. The results of the study will aid the development of better metrics of exposure for use in studies of the health effects of pesticides. To date the results of this study have been used in developing an educational booklet produced in collaboration with the Purdue University Extension Service entitled "Family Exposure to Pesticides...a discussion with farm families". This booklet discusses the risk of pesticide exposures and how farm families can limit their exposure.



Screening for Lead Exposure in Pregnancy

Because lead is readily transferred across the placenta, maternal exposure may result in potentially toxic fetal exposures. With evidence that blood lead at levels below the Centers for Disease Control "level of concern" in children may cause long-term cognitive and neurobehavioral effects, the use of a questionnaire for risk determination in pregnant patients has been recommended by the Minnesota Department of Health (MDH) for use in pregnant patients. Drs. Rice and Baker, in cooperation with MDH, conducted a pilot study to identify risk factors in pregnant women which correlate with elevated levels of blood lead. This work is being used to target screening more precisely toward

those women at increased risk and develop clinical recommendations for health care providers.



Minnesota Health Partnership Disability Prevention Project

The Minnesota Health Partnership (MHP) Coordinated Healthcare and Disability Prevention Project was sponsored by the Robert Wood Johnson Workers Compensation Health Initiative. This demonstration and evaluation project piloted and evaluated a model of health care that combines the best practices of general health and workers compensation medical care. This work has resulted in the dissemination of disability prevention principles and practices through national medical journals such as the American Family Physician, on line medical references such as Up To Date and the Workers Compensation Health Initiative Website, inclusion within the formal curriculum of family medicine residency programs, and inclusion of principles within the June 2006 ACOEM Disability Prevention Guideline.

Preparation of Occupational Medicine Physicians

Drs. Baker, Greaves, Zheng and Brosseau, along with resident physician Kenton Dodd assessed the demographic profile and opinions of current United States occupational medicine physicians on the importance of specific core competencies required of their specialty. Physicians valued core competencies related to hazard recognition, behavior and communication most highly. Professionalism, interpersonal communications and clinical occupational medicine were ranked as most valuable for employers. These observations provide guidance for the content of training programs, suggesting that greater emphasis be placed on career development skills.