

Getting Wise About Workers

U.S. WORKERS ARE TOILING LONGER HOURS WITH LESS SECURITY. ECONOMIC SHIFTS ARE CREATING NEW CONCERNS AS OLD ONES PERSIST. THROUGH RESEARCH AND EDUCATION, THE SCHOOL SEEKS TO KEEP WORKERS WELL.



We All Gain from Promoting the Health of Employees

Jeff Birkner has been an industrial hygienist for two decades

and is vice president of technical services for a major respirator manufacturer. But he couldn't have possibly appreciated the scope of worker health and safety issues arising from different industrial processes until, as a doctoral student at the UCLA School of Public Health, he was given the ultimate tour.

Above: Students who take the "Health Hazards of Industrial Processes" course offered by the school's NIOSH Education and Research Center tour a different type of industrial facility each week to learn about the health and safety challenges associated with various processes.

Through "Health Hazards of Industrial Processes," offered every Winter Quarter, Birkner and other students – both doctoral and master's – at the school-based Southern California NIOSH Education and Research Center (ERC) piled into a van and journeyed to a different type of industrial facility each week, surveying the plant and talking with management and workers before writing a report on the health hazards and how they are handled.

A surface mining operation in Boron, Calif. A secondary smelter that recycles batteries into metallic lead. An electroplating shop. A petroleum refinery. A manufacturer of roof shingles. A food-processing facility. A maker of bathtubs and

shower enclosures. An iron foundry. Some are union shops, others are not. Some are large corporations with thousands of employees and nationwide facilities, others are mom-and-pop operations. It's the full spectrum of manufacturing facilities encountered in the occupational health and safety field, with challenges ranging from a variety of potential chemical and environmental exposures to the gamut of safety and ergonomic issues.

"We're in the middle of California's manufacturing base, which provides an ideal laboratory for students that we are able to take advantage of," says Dr. William Hinds, professor at the school and director of the ERC, one of 16 multidisciplinary centers across the country supported by the National Institute for Occupational Safety and Health for education and research in occupational health.

Students appreciate the hands-on experience. "The ERC program provides a strong foundation in the theory so that we are better able to solve problems on our own, and that course was great practice for industrial hygiene work – an excellent overview of the types of hazards that are out there," says Samantha Yaussy Chua, who received her M.S. from the program last spring and now works as technical lead – taking and analyzing samples at workplaces and homes – for an environmental consulting company.

Health Hazards of Industrial Processes, a team-taught course led by Dr. Nola Kennedy, adjunct assistant professor at the school, is the capstone of the Southern California NIOSH ERC, which offers degrees in occupational medicine and occupational health nursing as well as industrial hygiene. Approximately 40 students are supported through a training grant that the school has received since 1983. The funding – renewed for another five years effective last July – also supports a continuing education and outreach program as well as training for hazardous waste workers.

Part of the job of many of the environmental specialists trained in the school's Industrial Hygiene Program is to interpret the toxicological research on health hazards and use that information to evaluate and control exposure to potentially dangerous chemical agents. "There is a lot of good research that's been done, but there is still uncertainty, and a good deal of judgment that goes into making decisions concerning these exposures," says Hinds. "These chemicals are mostly invisible – you typically can't sense them – and they cause disease over a long period of time, so you don't get much feedback that people are being overexposed. You have to understand the nature of these risks, and that requires special training that we provide in our programs."

Each day, an average of 9,000 U.S. workers sustain disabling injuries on the job, 16 die from an injury suffered at work, and 137 die from work-related diseases. Moreover, even as the traditional focus of injuries and illnesses from workplace exposures remains as important as ever, occupational health and safety experts in the ERC, elsewhere in the school and throughout the country believe the proper approach to promoting the health of workers also takes into account other concerns.

"We've learned to look at health and safety more broadly," says Dr. Linda Rosenstock, who was director of NIOSH before becoming dean of the UCLA School of Public Health, and whose *Textbook of Clinical Occupational and Environmental Medicine* (Elsevier Science, Second Edition) was released in October. "We have a better understanding that worker health is related to such factors as employment security, uninsurance, appropriateness of work settings, and job-related stress. We have had great success dealing with traditional problems like chemical hazards and lead exposure, but with the shifts in the workforce and the nature of work, other health issues are emerging."

In particular, Rosenstock notes, changes in work organization raise new concerns. U.S. workers are putting in longer hours than they did 20 years ago – 47 hours a week on average. Thirteen percent have two jobs. Workers in the United States lead the world in the number of hours clocked per year – more on average than Japanese workers, and 350 hours (about nine work weeks) more than Europeans. Not coincidentally, workplace stress is a growing problem. An estimated 13% of U.S. worker compensation claims



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ERC students tour the parts area at a Metropolitan Transportation Authority facility in Los Angeles, where buses are repaired and engines rebuilt or refitted for changing to compressed natural gas.



are for stress-related disorders. Twenty-seven percent of U.S. workers report their jobs are their greatest single source of stress. Additionally, 46% frequently worry about being laid off – a proportion that has more than doubled in the last 20 years. One in four U.S. workers is in a non-traditional employment situation – including temporary or contingent work and self-employment – often not by choice. And of the 45 million Americans who have no health insurance, more than 80% are in working families, with the burden falling disproportionately on younger workers, minority workers, and those with less education.

Addressing such concerns benefits not only the workers who bear these burdens, but also U.S. businesses, Rosenstock points out. “People often miss the fact that investing in worker health and safety can improve a company’s bottom line,” she says. “For example, we have known for a long time that doing so in the car manufacturing process decreases the cost of health-related illness and increases economic productivity, and is also linked to improving the quality of the products. People questioned whether this could be generalized to other industries, and we now have evidence that, in fact, the same is true when it comes to investing in the health and safety of the health care workforce.”

That evidence comes in part from a study by Dr. Jack Needleman, who was at Harvard at the time and is now an associate professor at the UCLA School of Public Health. In 2002, Needleman reported in the *New England Journal of Medicine* results of the first large study drawing a connection between inadequate nursing staff levels and poorer patient outcomes. “When nurses are overworked, they

cannot do the same job of monitoring patient conditions that they can when nurse staffing is better,” Needleman explains.

Health care is one of the fastest growing work sectors – and one in which there are lingering concerns. Stresses on the system include a severe nursing shortage and an aging population that ensures increasing demands on health care personnel, particularly low-paid home-care workers. While rates of all workplace injuries and illnesses are declining, rates for health care workers – now 8% of the U.S. workforce – are on the rise. They face risks from lifting, stress, assaults, blood-borne and respiratory infections, and latex allergy from the use of protective gloves, to name a few.

In addition to the potential for allergic reaction, gloves and other items meant to protect workers in certain industries are not always as effective as they might appear. Dr. Shane Que Hee, professor of environmental health sciences at the school, has conducted studies of the amount and characteristics of chemicals that pass through “protective” materials. He and his students have found that when complex mixtures such as pesticides and metal-working fluids permeate gloves, what gets through is often significantly different from the original chemical composition. “That means you can’t necessarily look at the dominant compounds in a mixture and say that a glove will be permeable or not,” he explains. “You have to do the experiments to know for sure.”

The wearing of protective materials often provides a false sense of security for workers, Que Hee says, because workplace conditions don’t necessarily mimic conditions used by government regulators to certify them. “The highest concentrations of expo-

tures typically occur in the workplace, where you have closed conditions, ventilation can be poor, and workers are often in close proximity to the source of exposure,” he says. In the same manner, wearing a respirator does not necessarily protect a worker. Que Hee has developed technology to sample the air inside a respirator to measure what gets through the filters and methods to detect whether this material is toxic if the exposing agent is unknown.

Dr. Wendie Robbins, an associate professor in the UCLA School of Public Health and School of Nursing and director of the ERC’s Occupational and Environmental Health Nursing Program – in which future occupational and environmental health nurses take public health as well as nursing courses to learn more about high-risk worker populations – is heading a NIOSH-funded team examining the reproductive effects of occupational exposure to boron in male workers who mine the element in Liaoning Province, China. Robbins is conducting the study in China because the exposure levels are significantly greater at the plant there than in the mining plant in Boron, Calif., toured by the ERC students – the only such plant in the United States – rendering it more likely that her group will be able to detect levels at which the element causes risk.

On the other hand, perhaps as a byproduct of Robbins’ research, worker health and safety measures at the plants being studied in China have recently improved. “It makes it more difficult to conduct the study, but it is very gratifying to me that we seem to be having this positive impact on worker health and safety,” she says.

Back in Los Angeles, Dr. Beate Ritz, in collaboration with ergonomics researchers at UC San Francisco and UC Berkeley, is addressing another pervasive problem. Her study of more than 300 garment workers recruited from shops in Chinatown and El Monte tests the impact of redesigned work stations and ergonomic chairs on prevention of pain and musculoskeletal disorders. Job-related musculoskeletal disorders such as low-back pain, tendonitis, and carpal tunnel syndrome account for much of the cost of work-related illnesses and injuries in the United States, amounting to an estimated \$13-\$54 billion in annual treatment costs.

Certain settings place workers at higher risk for violence, notes Dr. Jess Kraus, professor of epidemiology and director of the school-based Southern California Injury Prevention Research Center. These include small businesses – such as



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ERC students tour the US Borax mine facility, where boron is processed.

At LASCO in Anaheim, Calif., ERC students view a shower stall mold and learn how shower enclosures are coated with fiberglass and other resins by a spray-on process.



liquor stores, gas stations, bars, fast food restaurants, and taxi driving – where there are late-night hours and money is exchanged. “A proportion of the workforce is in settings where security measures can be taken,” says Kraus, “but it’s not as feasible to offer protective services to a small liquor store, for example. In such cases, there is constant exposure to risk.”

Differentiating violence that is work-related from that which is not can be difficult. Sometimes, work just happens to be the setting for a violent act committed by a perpetrator who knows that is where he or she can find the victim. Kraus is currently completing a study seeking to improve the classification of suicide at work. In examining California coroner records, he found that because suicides are classified based on where they occur – without regard to the motivation behind them – many are mislabeled. “If we want to look at risk factors for suicide at work so that we can prevent it, we need to improve the way suicides are classified,” he says.

At the UCLA Labor Occupational Safety and Health (UCLA-LOSH) Program, part of the School of Public Health-based Centers for Environmental Quality and Health, there is a focus on two populations that are particularly vulnerable to work-related injuries and illnesses: immigrants and the youngest workers. “These are two groups that are more likely to take whatever job they can get, without training on the health and safety issues they will face, and that are often unaware of their rights as workers or afraid to voice concerns or report injuries for fear of losing their jobs,” says Linda Delp, UCLA-LOSH’s director effective in January 2005, replacing Marianne Brown, who retired as director earlier this year. UCLA-LOSH has targeted both immigrant workers and high school students with education and training initiatives. The program is also the lead agency in a National Institute of Environmental Health Sciences-funded consortium to train workers who clean up hazardous waste sites, and is participating in health and safety training for port workers along the West Coast.

It is the working poor and working middle class who disproportionately bear the burden of workplace illness and injury as well as uninsurance, notes Rosenstock. By compiling evidence of what causes problems in health status for workers and which interventions are effective in addressing these problems, public health can make a significant difference in the lives of workers – a population that, after all, includes almost all adults at one time or another.



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