Department of Environmental and Occupational Health Sciences

Environmental Health News

School of Public Health and Community Medicine ■ University of Washington ■ Winter 2003

Department Changes Its Name

The former Department of Environmental Health officially became the Department of Environmental and Occupational Health Sciences on Feb. 1. We believe the new name better describes the scope of research, teaching, and service activities in our department. This issue of Environmental Health News describes reasons for the change and profiles programs that show the close relationships between our environmental and occupational health missions, and between our basic and applied science research programs.

Inside

Help Us Celebrate Our New Identity

Thursday, May 22, from 12:30 to 3:00 pm, the Department of Environmental and Occupational Health Sciences will host a celebration of our new name, and of this year's class of student researchers.

You are invited to our annual Student Research Day. Four selected graduate students will present their research at a seminar in Auditorium D209 in the Health Sciences Building, followed by an open house in the lobby of the Health Sciences Building. The open house will feature posters by graduating master's and some PhD student researchers.

Watch for a flier in the mail and on our Web site.

Here's Why

–Dave Kalman, Chair

Change can be challenging. With this issue of our newsletter we highlight our departmental name change, from "Environmental Health" to "Environmental and Occupational Health Sciences." The change was approved by the departmental faculty in October and the University of Washington Board of Regents in January.

By adding the word "occupational" to our title, we emphasize our contributions in the field of workplace health and safety. The inclusion of "sciences" makes explicit the academic thrust of our department. We have been involved in workplace health and safety issues since at least the early 1960s and workplace hazards figure prominently in our mission statement.

We hope that this change will better communicate our mission and activities. We found that the old name was not well understood and often confused with other departments on campus, such as the Environmental Health and Safety service program and the Program on the Environment. At the same time, we saw a need to better describe our department and its programs, both to recruit students and to convey our academic focus to people on and off campus.

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Though our name has changed, our mission remains the same:

- to identify agents in the environment and the workplace that affect human health
- to elucidate their mechanisms
- to develop strategies for confronting their effects
- to share the knowledge obtained.

In addressing this public health mission, our goal is to promote excellence in education and research.

The name change and proposed makeover of our printed and electronic information is part of a larger effort to increase our communication with external clients and partners. We have added other activities and events to this outreach effort, and this year will be launching a new advisory "partnership" committee composed of employers and workers in Washington state. In this and future issues of *Environmental Health News*, you will learn of new efforts to convert our academic activities into improvements in workplace safety and health. Stay tuned.

55 YEARS OF WORKPLACE HEALTH

1948	First industrial hygiene courses offered at UW School of Medicine
1951	Environmental Research Laboratory officially established at UW School of Medicine
1963	Washington state Legislature funds the Environmental Research Laboratory to do research, teaching, and service in occupational health
1970	Department of Environmental Health established in new School of Public Health and Community Medicine
1977	NIOSH establishes Northwest Center for Occupational Health & Safety at UW
2003	Name changed to Department of Environmental and Occupational Health Sciences

THE NAME IS NEW, THE PROGRAM ISN'T

The words "occupational" and "sciences" were added to the department's name in 2003, but a focus on both dates back half a century.

Crossover between occupational and environmental health is not new, said Lee Monteith, who joined the department in 1965. He recalls the Environmental Research Laboratory (ERL) doing sampling and analysis for small business in the 1960s. "In the old days, there was nobody else to look at workplace exposures, so we went out and investigated," he said.

Jack Hatlen, who earned his undergraduate degree in our department in 1949 and has been on faculty since 1952, recalls that the name Environmental Health was first used to identify a new division within the Department of Preventive Medicine. This division included the undergraduate program in Sanitary Science (which was renamed Environmental Health) and a greatly expanded Environmental Research Laboratory. The environmental emphasis was strengthened in 1963, he recalls, when the Legislature allocated workers' compensation funds to the Environmental Research Laboratory.

In 1970, Environmental Health became a department in the new School of Public Health and Community Medicine. A preventive medicine residency program began shortly thereafter. Teaching, research, and service were given equal weight in the early days, Hatlen said. The Environmental Health Laboratory (successor to the Environmental Research Laboratory) still supports service, basic research, and student training.

Back then, the department's emphasis "might have been a little more toward the practical," Monteith said, but applied research soon grew into longer-term studies. In the late 1960s, for example, Monteith was in Oregon sampling the smoke from slash burns and calculating environmental and occupational exposures (a forerunner to research being done in the department today—see page 6).

THE FIRST OCC MED DOC

The science of occupational medicine emerged in Italy during the 17th century with the work of Dr. Bernardino Ramazzini.

Ramazzini graduated from the University of Parma in 1659 with doctorates in philosophy and medicine. In 1682, he returned to his hometown University of Modena as chair of medicine. In 1700, he accepted the chair of practical nedicine at the University of Padua and published the first edition of his most famous book, the *De Morbis Artificum* (Diseases of Workers).

His book, the first comprehensive work on occupational diseases, outlines the health hazards of chemicals, dust, metals, and other abrasive agents encountered by workers in 52 occupations.

Ramazzini often quoted Pliny, Hippocrates, and other ancient Greeks. He also made his own observations. For example, he noted that goldsmiths who breathe mercury fumes "soon become subject to vertigo, asthma, and paralysis. Very few of them reach old age, and even when they do not die young their health is so terribly undermined that they pray for death."

He was a keen observer, even within the limitations of the science of his time. He describes the death of a young goldsmith: "He died without having had the least sign of fever. This was a great surprise to me, for I could not make out how so great a putrefaction of the humors could fail to excite fever heat." Ramazzini described a later finding that mercury reduces fever, and even suggested prescribing "sweet mercury" as a remedy for fevers.

He was familiar with herbal remedies of the time, and prescribed what might today be considered folk remedies. He wrote, "nothing is better than vinegar for correcting and breaking up the narcotic element of opium." He also prescribed olive oil and hot baths for workers' ailments.

Ramazzini advocated occupational and public health protections. For the health of cleaners of privies and cesspits, he writes: "It is right and proper that the art of medicine should furnish some sort of protection for these workers whose labor is so necessary in every city."

He also exhorted his fellow physicians to take an occupational history of every patient, advice that remains pertinent today.

IN RAMAZZINI'S TIME

1650	Otto von Guericke invents an air pump
1663	James Gregory invents the first reflecting telescope
1656	Christian Huygens constructs an accurate pendulum clock
1666	Isaac Newton publishes his first physical laws
1670	Pocket watches add minute hands
1687	Isaac Newton's *Principia Mathematica*
1702	The first daily newspaper in the English language, *Daily Courant*
1709	English Parliament passes Copyright Act
1709	Bartolomeo Cristofori invents the piano

Ramazzini engraving: Courtesy of the National Library of Medicine

Timeline information comes from
http://inventors.about.com/library/inventors/
http://www.mediahistory.umn.edu/time/

Map of Italy: ©2003 www.arttoday.com

FOR FURTHER READING

Franco, G. "Ramazzini and workers' health." *The Lancet*. 354:858–859. Sept. 4, 1999.

Ramazzini, B. *Diseases of Workers: De Morbis Artificum*. New York Academy of Medicine, History of Medicine Series, No. 23. Hafner Publishing Co., New York, 1964.

DISTINGUISHED FACULTY LECTURE

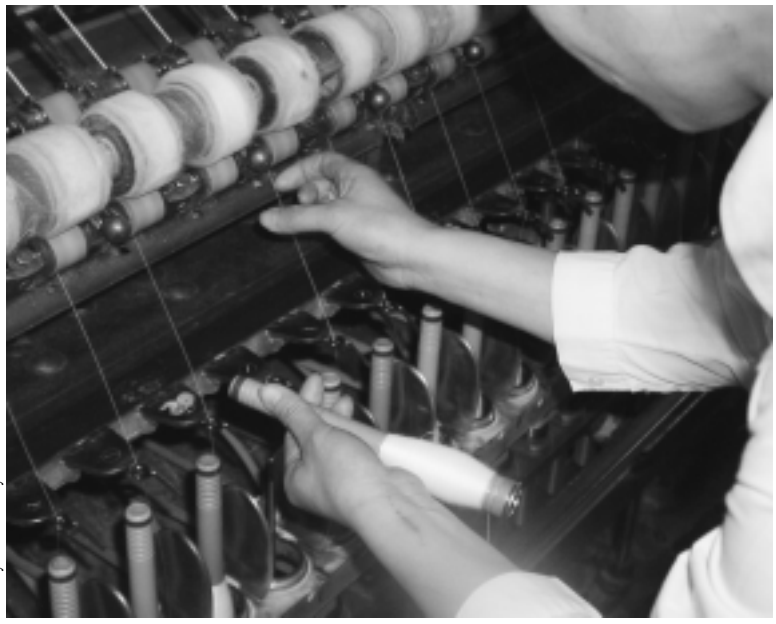
Identifying environmental risk factors for disease: From slam dunks to needles in haystacks

Harvey Checkoway

"There are two essentials for discovering environmental risks for disease," Professor Harvey Checkoway said at the winter quarter Distinguished Faculty Lecture for the School of Public Health and Community Medicine. "First you need good research questions. Then, you need the right populations for study. An element of luck also helps."

"RIGHT POPULATIONS"

For Checkoway, the "right populations" have included diatomaceous earth workers in California, lead smelter workers in British Columbia, and textile workers in China. He has conducted research on the health effects of exposure to silica, lead, solvents, pesticides, cigarettes, and various dietary items.



Spinning machine operator in Shanghai, China

Harvey Checkoway

This diversity reflects the broad range of Checkoway's research, which frequently crosses boundaries between environmental and occupational health.

Checkoway and his colleagues have studied the possible causes of diseases such as silicosis that are almost exclusively related to exposures on the job, as well as Parkinson's disease and lowered sperm counts that have been associated with both environmental and occupational exposures.

Checkoway used an admittedly mixed metaphor in the title of his presentation, "Identifying environmental risk factors for disease: From slam dunks to needles in haystacks." His goal was to describe the differing levels of certainty and complexity in his research results. The "slam dunk" was a relatively clear-cut case of occupational exposure to silica leading to silicosis and other lung diseases. The "needle in a haystack" referred to environmental and genetic risk factors for Parkinson's disease.

Extensive research by Checkoway and others has shown that Parkinson's disease risks may involve interactions among numerous genes, and can be related to both environmental and occupational exposures.

EPIDEMIOLOGICAL METHODS

The common link among these projects is the use of epidemiological methods to study possible associations among genes, the environment, and disease. Checkoway has a joint appointment in both the Department of Environmental and Occupational Health Sciences and the Department of Epidemiology. He also directs the UW Superfund Basic Research Program and the Training Grant in Environmental and Molecular Epidemiology, both funded by the National Institute of Environmental Health Sciences.

Epidemiological studies typically examine differences in health risks between people exposed

HARVEY CHECKOWAY

to a substance presumed to be hazardous and people without such exposure. This is known as a "cohort study." Alternatively, epidemiological "case-control" studies involve past exposures among people, referred to as "cases," who have a certain disease compared with exposures experienced by people, called "controls," who do not have the disease. Well-known examples of these two types of research include cohort studies of cancer among workers exposed to asbestos and case-control studies of lung cancer in smokers and nonsmokers.

In Checkoway's silicosis and lung cancer research, the exposed cohort was composed of workers in the diatomaceous earth industry who regularly inhaled crystalline silica on the job. The research was a "slam dunk" because it showed a clear dose-response relationship between exposure and disease. A longer and more intense exposure to crystalline silica was associated with a greater risk of developing silicosis and lung cancer. Elevated risks were also found for obstructive lung diseases, such as emphysema. The findings were applicable only to occupational health because silica exposure is only a danger on the job. Though sand is a form of silica, "You won't get silicosis by visiting the beach," said Checkoway.

PARKINSON'S DISEASE

The causes of Parkinson's disease are more subtle and complex than those for silicosis, and may include lifestyle factors as well as occupational exposures. For example, Checkoway's research has shown that the risk of Parkinson's disease was reduced among cigarette smokers, a finding that agrees with most previous research. Checkoway's study also showed that the risk reduction from smoking was limited to men who have one variation of the gene for the enzyme MAO-B.

There seems to be an interrelationship among among smoking, MAO-B, and Parkinson's disease; MAO-B destroys dopamine, and smokers produce less MAO-B enzyme. Dopamine is a neurotransmitter that coordinates movement. Lack of dopamine causes Parkinson's disease.

The results from this gene–environment interaction have been both supported and contradicted by other research. This ambiguity may be due to the relatively small size of the groups that have been studied. "To investigate gene–environment interactions effectively, studies will need to include thousands of cases and controls," said Checkoway. Finding such large numbers of participants and conducting the relevant studies can be difficult and expensive for a single lab or university department. Therefore, Checkoway is exploring collaborations with other research groups to pool resources and data.

Checkoway is also continuing to explore other environmental and occupational factors that may affect the risk for Parkinson's disease, including exposures to manganese and pesticides.

–Kris Freeman

Devon DeLapp

Paola Costa-Mallen, research scientist (foreground), and Zahra Afsharinejad, research technologist, analyze DNA samples from Parkinson's disease study subjects using a polymerase chain reaction (PCR) machine

CHRIS SIMPSON

Assessing environmental and occupational exposures to wood smoke

Chris Simpson, the department's newest faculty member, studies both environmental and occupational exposures

Wood smoke is an environmental health concern. It hangs over cities and valleys each winter and some people—the most susceptible among us—can become ill or die from it. Wood smoke is also an occupational health problem, particularly for wildland firefighters.

Christopher Simpson, the department's newest faculty member, studies both environmental and occupational exposures. His goals are to accurately assess exposures and determine how various doses of wood smoke affect health symptoms. He is also looking into how quickly the body excretes wood-smoke compounds.

Simpson, an environmental and analytical chemist, is working with the Environmental Protection Agency's Northwest Research Center for Particulate Air Pollution and Health (PM Center), housed at UW. There he is involved with measuring exposures to air pollutants, especially at low levels. One concern is health effects among vulnerable populations.

BIOMARKERS

Simpson measures biomarkers of exposure—many of them developed by Dave Kalman and others in the Environmental Health Laboratory. Biomarkers provide an accurate way of assessing an individual's exposure, Simpson said (see next page). Direct measurement of pollutants using regional monitors isn't as reliable, he said, because wood smoke levels vary throughout Seattle's hills and valleys, and throughout the day (they are higher in the evening).

By measuring biomarkers in urine samples, Simpson can calculate a person's exposure to wood smoke over the past few days. He can also separate wood-smoke exposure from other environmental pollutants, such as automobile exhaust.

Research usually proceeds from the high exposures of occupational groups to the lower exposures in the environment. It is simpler technically to measure biomarkers in a high-exposure situation and fewer samples are required to observe significant effects. Simpson's research has gone the opposite direction—from environmental to occupational exposure—because his initial studies were funded by the Environmental Protection Agency through the PM Center.

He recently started an occupational study funded by the National Institute for Occupational Safety and Health (NIOSH) to study smoke exposures in wildland firefighters who set controlled burns. Controlled burns are predictable, and it is possible to take baseline samples from firefighters who are scheduled to fight the blaze.

Simpson says that a lot of evidence exists that wood smoke is bad for human health. "It's hard for people to believe," he said. "We all grew up with occasional exposure to campfires, and we have a lot of familiarity." But, especially in the developing world, studies have tied high levels of wood-smoke exposure to chronic conditions. Much of this research has been done in rural India, where people burn plant material and animal waste for heat.

The PM team has looked at health effects, including increased prevalence and severity of asthma and respiratory symptoms, increased asthma medication use, changes in lung function, and cardiac effects. People vary in their sensitivity to wood smoke.

ENVIRONMENTAL BACKGROUND

In his native New Zealand, Simpson worked with biomarkers for physical or psychological stress in deer, and chlordane contamination in soil, marine sediments, bivalves, and marine worms. He came to North America 12 years ago to study environmental chemistry, which isn't emphasized in New Zealand.

He first came to the University of British Columbia (UBC), where he received his PhD in environmental and analytical chemistry. He studied pollution from aluminum smelters in coastal waters,

US Army Master Sgt. Lewis Matson, National Interagency Fire Center

Wildfires can cause occupational as well as environmental exposures

specifically polycyclic aromatic hydrocarbons (PAH) in marine sediments and the soft-shelled clam, *Mya arenaria*. He believes these studies represent the first time that a PAH-conjugate metabolite has been identified in mollusks. He also refined a nonlethal measure of exposure to polycyclic aromatic hydrocarbons in mallards.

From UBC, he went to the University of Minnesota where, as a post-doctoral fellow, he focused on methods for analyzing benzo[a]pyrene (BaP) metabolites in human samples. He developed biomarkers for the activation of BaP to carcinogenic metabolites. Some of this work was in occupational health, analyzing biomarkers from steelworkers in Taiwan.

He came to Seattle because he "likes the West Coast." He has been with the Environmental Health Laboratory and the PM Center since 2000, and was officially appointed to the faculty as an assistant professor earlier this month.

Simpson was attracted to the department's combination of epidemiology, health effects, and analytical chemistry. "I like the way this department brings together people with different skills to work on the same project," he said. "This is important to both environmental and occupational health sciences."

"There is plenty to do in both environmental and occupational health," he said. He envisions using biomarkers in high-exposure situations in India or other developing nations and working with environmental and occupational health researchers to develop interventions and monitor their effectiveness.

Biomarkers

Biomarkers are indicators of events or changes in biological systems. A biomarker can be a chemical substance or a biochemical response. A wide range of substances can be used as biomarkers, and they can be measured in blood, urine, hair, exhaled breath, and saliva.

Several laboratories in the Department of Environmental and Occupational Health Sciences use biomarkers, but Chris Simpson, an analytical chemist in the Environmental Health Laboratory, uses them differently than the department's toxicologists.

Simpson's work measures small amounts of chemicals that are not normally present in the body, while the toxicologists generally look at changes arising within the body. For example, toxicologists might look at protein expressions that indicate exposure to pesticides or mercury, or DNA changes that signal exposure to a harmful chemical.

A good biomarker should be abundant and specific to the exposure or response of interest, Simpson said. For example, methoxyphenols are generated by burning the wood polymer lignin. They are found in the human body after exposure to wood smoke. Another component of wood smoke—vanillin—is too common to make a good biomarker. It could turn up, for example, in the urine of someone who has just had ice cream or a vanilla latté.

STARTING SAFETY YOUNG

The future of occupational health and safety is evident in Richard Goodrich's wood shop at Ballard High School. Under his supervision, the four classes that work in the school's wood shop are learning the proper way to use shop tools, safety devices, and personal protective equipment.

Goodrich and his colleagues across the state—from Westport and Mead to Lyle and East Wenatchee—are working with the Department of Environmental and Occupational Health Sciences' program called Health and Safety Awareness for Working Teens to improve safety education in Washington state high schools. The program grew out of the School to Work Opportunities Act of 1994, which was designed to coordinate state and local programs that address the career development and work preparation needs of all students.

Though high school shop students may not pursue careers in the building trades or woodworking, they will learn safety lessons and skills in these wood shop classes that will stay with them through their future careers and hobbies, said Darren Linker, School to Work program manager. By developing safe work habits early in life, these students will be less likely to experience a serious injury. Students are learning good work habits while they learn their craft, he noted.

If Ballard High is typical, wood shop students start learning about safety from the moment they walk in the door and put on their safety glasses. In Goodrich's shop, one of the most potentially hazardous pieces of equipment—the table saw—was recently equipped with a new guard and a splitter. Goodrich personally supervises each of his beginning woodworking students as they learn to use this saw.

Richard Goodrich (right) shows a student how to safely push a board through a table saw

Kathy Hall

NEW TOOL

Soon the state's high school shop teachers will have a new educational tool. Leigh Caplan, a designer in the department, is helping Linker develop a Web site that will walk students step-by-step through most common shop tools and safety equipment.

For example, a student might select a band saw from a virtual shop. The site will walk him or her through a preflight setup (take off jewelry, put on safety glasses…) and teach the proper way to set up and use the machine. After taking a quiz, the student can move on to the next tool. In addition to learning about tools, students will also learn about the wide range of safety and health hazards that are unique to working in a wood shop.

Teachers will be able to download safety tests for equipment that is commonly found in most wood shops. The site will also provide them with other relevant safety resources related to the building trades. The site will be particularly useful for teachers who may be new to teaching or who may lack materials to teach safety to their students, Linker said. Lessons are written at about a sixth-grade reading level, so they also can be used in middle schools.

This Web project grew out of the School to Work/Occupational Safety and Health Curriculum advisory committee, Linker said. Statistics showed that shops—particularly wood shops—were a leading site for injuries in Washington high schools. Linker conducted a needs assessment with the building trades subsection of the Washington Industrial Technology Education Association and decided that a Web site would be the best educational vehicle.

A test version of the site was introduced at the Washington Industrial Technology Education Association's spring conference in late March in Wenatchee. Linker sought early feedback to ensure that the Web site meets the needs of these shop teachers. Response to the Web site was enthusiastic. As a group, these teachers were eager to have a new tool to reinforce safety with their students. One teacher said high school students perceive Web sites as credible sources of information.

The wood shop safety site, which will be ready for the start of the 2003-2004 school year, will be the first online training aide developed within the department, said Kathy Hall, the department's senior editor. (A third-party vendor developed the Continuing Education Program's Region X Online Training Institute.)

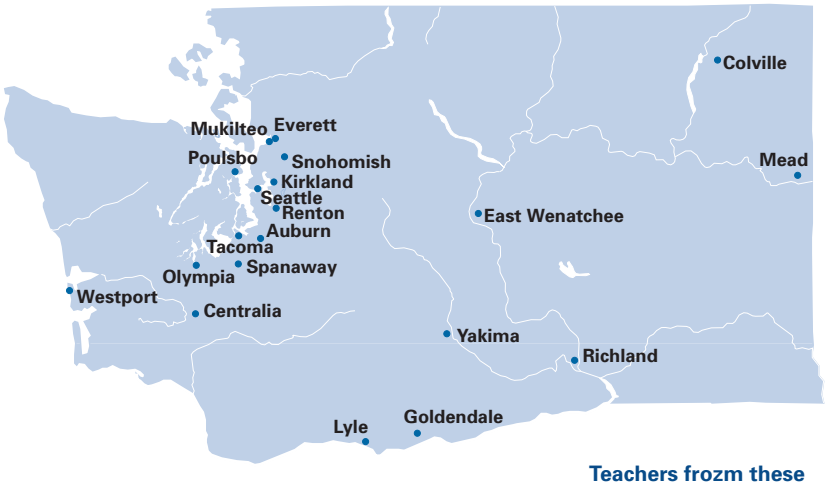
The department's School to Work program integrates occupational safety and health concepts and curricula into secondary-level classrooms and teacher-training programs. "Our goal is to reduce workplace injuries and illnesses and their consequences by educating students about workplace health and safety and by promoting an attitude of occupational injury and illness prevention," Linker said.

FOR MORE INFORMATION

Visit our Health and Safety Awareness for Working Teens Web site at *http://depts.washington.edu/worksafe/*. The wood shop site will be linked when it is available.

Kathy Hall

A student cuts out a design on a band saw



Teachers frozm these communities helped develop the Web site

Band saw illustration: Leigh Caplan

Chris Hassett died in late January at age 51. Dr. Hassett was a principal research scientist in Curt Omiecinski's laboratory. He worked in our department for nearly two decades, before leaving last summer to help Curt set up his new laboratory in Pennsylvania. Dr. Hassett made many important contributions to toxicology, public health genetics, and environmental health.

David Bates, chair of the external Science Advisory Committee for the Northwest Center for Particulate Air Pollution and Health, has been made a member of the Order of Canada, that country's highest honor for lifetime achievement. Dr. Bates was recently interviewed on National Public Radio for his role in treating patients during London's killer fog of 1952.

Janice Camp co-directed the annual Semiahmoo conference with our peers at the University of British Columbia in January. UW presenters included **Scott Meschke, Pete Johnson, Jennifer Ibbotson, Noah Seixas,** and **Dave Kalman.**

Kathy Hall and **Cathy Schwartz** won "Best of Show" in the international technical publications competition of the Society for Technical Communication for the department's biennial report. **Hall** has been recognized as an Advanced Toastmaster Gold, the highest award in Toastmasters International communication program.

Joel Kaufman gave the annual Alice Hamilton Memorial Lecture at the University of California, San Francisco, in January on "Emerging Occupational and Environmental Diseases."

Carrie (Carrel) Loewenherz, a 1996 graduate, has been hired as City Research Scientist with New York City's Environmental Health Bureau. She will work on the production of New York City's chemical response plan, part of a Centers for Disease Control program to prepare states and cities to respond to nuclear, biological, and chemical attacks.

David Bates

Janice Camp

Joel Kaufman

Carrie Loewenherz

John Malool, who teaches in the Continuing Education program, received a distinguished safety award for outstanding service by the Washington state Department of Agriculture's waste pesticide disposal team. More than one million pounds of pesticides have been disposed without an accident due to Malool's devotion to hazardous waste safety training, according to presenters at a January ceremony in Olympia.

Rick Neitzel received an award for outstanding service to the construction industry through educational efforts from the Puget Sound Area Construction Safety Summit. He has studied noise exposures among construction workers.

Sankar Sambandam visited the biomarker lab in December to learn about our wood smoke assay as part of the Fogarty international scholars program. He is a senior research officer, Environmental Health Engineering Cell at Sri Ramachandra Medical College and Research Institute in Tamil Nadu, India. He has been involved with a number of studies in India examining the health effects associated with indoor air pollution from biomass burning (see pages 6–7).

Gerald van Belle was honored for his outstanding contributions to statistics and public health during the November annual meeting of the American Public Health Association's Statistics Section. Each year, the section makes three awards: to statisticians in academia, government, and industry/nongovernmental organizations. Van Belle was honored for his contributions to research in environmental and occupational health, Alzheimer's disease, and teaching and administration.

Lori Winnemuller and **Steve Russell** of the Field Research and Consultation Group made a presentation to the Pacific Northwest Section of the American Industrial Hygiene Association in February on implementing the Washington state ergonomics rule.

CONTINUING EDUCATION

To confirm this schedule or find more information about these courses, call 206-543-1069 or visit the Continuing Education Web site at *http://depts.washington.edu/ehce*. Courses are in Seattle unless noted.

NW CENTER FOR OCCUPATIONAL HEALTH & SAFETY

Apr 23	Assessing Ergonomic Hazards in the Workplace
May 21	Puget Sound Occupational and Environmental Medicine Grand Rounds
Jun 12	Puget Sound Occupational and Environmental Medicine Grand Rounds
Jun 20	American Association of Occupational Health Nursing Core Curriculum in Environmental Health

Jim Hughes from the Department of Labor & Industries and Christine Morris of Tesoro Refining and Marketing Co. edit a formal letter during a group writing exercise at the March course on Clear Writing for Safety and Health Professionals

Kathy Hall

OSHA TRAINING INSTITUTE EDUCATIONAL CENTER

Not for OSHA rules only! All classes offer training that meets WISHA, OR-OSHA, and Alaska state standards.

Apr 15-17	222A	Respiratory Protection
Apr 22-25	501	Trainer Course for General Industry (*Portland*)
Apr 29-May 2	600	Collateral Duty for Other Federal Agencies (*Portland*)
May 6-9	501	Trainer Course for General Industry (*Boise*)
May 20-23	301	Excavation, Trenching, and Soil Mechanics (*Anchorage*)
May 28-30	225	Principles of Ergonomics
May 31-Jun 7	500	Alaska Cruise: Trainer Course for Construction Industry (*departs from Seattle*)
Jun 3-6	521	OSHA Guide to Industrial Hygiene (*Portland*)
Jun 10-13	510	OSHA Standards for Construction
Jun 17-20	309A	Electrical Standards (*Portland*)

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May 6	Confined Space Entry (*Richland*)
May 6	Sampling for Hazardous Materials (*Richland*)
May 6	Homeland Defense–Bioterrorism: An Industrial Workshop (*Richland*)

UPDATE

The spring 2001 issue of *Environmental Health News* featured the National Center for Environmental Health's *National Report on Human Exposure to Environmental Chemicals.* The second such report has been issued as a continuing assessment of the US population's exposure to chemicals in the environment using biomonitoring. The report is online at *http://www.cdc.gov/exposurereport.*

The purpose of the *Report* is to provide exposure information to scientists, physicians, and health officials so they can help prevent disease from exposure to environmental chemicals.

The *Report* presents new data on the exposure of the US population to environmental chemicals. Advances in analytical methods allow scientists to measure lower and lower levels of environmental chemicals in people (see Biomarker story on page 7).

Discovery of an environmental chemical in a person's blood or urine does not by itself mean that the chemical causes disease, but it can point to further studies that can help determine which blood and urine levels are safe and which can result in disease.

THE FINE PRINT

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